# COPA Trade Practical: Half Year 2

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As per July 2022 syllabus

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# CONTENTS

## (1) To Create self introduction page using HTML

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs**.
4) Type **MKDIR <NAME>**. Type **CD <NAME>**. This will ensure that you will save all your files in your own folder.
5) Type notepad intro.html in command prompt.
6) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>
My Intro Page
</title>
<style>
p {
text-align:justify;
font-size:240%;
font-style:bold;
font-weight:bold;
color:blue;
text-indent:10mm
}
</style>
</head>
<body>
<h1 style="color:red; text-align:center;font-size:300%">
Welcome to my introduction page: Your name
</h1>
<p>
My name is .... I am studying COPA trade in Govt. ITI for Women, Puducherry. I am preparing for Merit Examination. The examination starts on 03-Feb-2023.
</p>
<p>
The second semester starts on 01-02-2023.
</p>
</body>
</html>
```

7) Open FireFox browser, press Ctrl+L and type the URL http://127.0.0.1/<name>/intro.html.

8) Verify that the introduction page loads.

## (2) To Create ordered and unordered list using HTML

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs\<NAME>**.
4) Type notepad list.html in command prompt.
5) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>
List of computer peripherals
</title>
<style>
h1{text-align:center; color:blue}
ol {font-size:120%; color:red}
</style>
</head>
<body>
<h1>List of computer peripherals</h1>
<ol>
<li>Monitor</li>
<li>Keyboard</li>
<li>Mouse</li>
<li>Printer
<ul>
<li>Line matrix printer</li>
<li>Daisy wheel printer</li>
```

```
<li>Golf ball printer</li>
<li>Dot matrix printer</li>
<li>Inkjet printer</li>
<li>LASER printer</li>
<li>Thermal printer</li>
<li>Dot matrix printer</li>
</ul>
</li>
<li>Scanner</li>
</ol>
</body>
</html>
```

6) Open FireFox browser, press Ctrl+L and type the URL http://127.0.0.1/<name>/list.html.
7) Verify that the list page loads.

## (3) To Create table using HTML

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs\<NAME>**.
4) Type notepad table.html in command prompt.
5) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Ice creams</title>
<style>
h1{color:green; text-align:center}
```

```
th {vertical-align:middle; text-align-centre; font-weight:bold;
background:lightgreen; color:red; font-size:120%}
#odd {vertical-align:middle; text-align-centre; font-
weight:normal; background:#FFBBBB; color:blue; font-
size:120%}
#even {vertical-align:middle; text-align-center; font-
weight:normal; background:#BBBBFF; color:red; font-
size:120%}
</style>
</head>
<body>
<h1>Types of ice cream (<your name>)</h1>
<span align="center">
<table border=1>
<tr><th>Sl.
No.</th><th>Name</th><th>Cream</th><th>Rate</th></tr>
<tr id="odd"><td>1</td><td>Dessert</td><td><img
width=20% src="ice-creams/01-
dessert.jpg"></td><td>Rs.120/-</td></tr>
<tr id="even"><td>2</td><td>Cone</td><td><img
width=20% src="ice-creams/02-cone.jpg"></td><td>Rs.60/-
</td></tr>
<tr id="odd"><td>1</td><td>Chocolate</td><td><img
width=20% src="ice-creams/03-choco.jpg"></td><td>Rs.90/-
</td></tr>
<tr id="even"><td>4</td><td>Cone</td><td><img
width=20% src="ice-creams/04-
strawberry.jpg"></td><td>Rs.100/-</td></tr>
</table>
</span>
</body>
</html>
```

6) Copy icre-creams folder inside c:\xampp\htdocs\<your_name>.
7) Open FireFox browser, press Ctrl+L and type the URL http://127.0.0.1/<name>/table.html.
8) Verify that the table page loads.

## (4) To create CSS based style sheets for HTML page

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs\<NAME>**.
4) Type notepad red.css in command prompt.
5) Type the following code, save the same and close notepad (This file will apply red colour theme to the HTML file):

```
body {
background-color: #222277;
font-size: 300%;
color: #FF0000
}
h1 {
color: #FF0000;
text-align: center
}
marquee {
background-color: #0000FF
}
```

6) Type notepad green.css in command prompt.
7) Type the following code, save the same and close notepad (This file will apply red colour theme to the HTML file):

```
body {
background-color: #222266;
font-size: 300%;
color: #00FF00
}
h1 {
color: #00FF00;
text-align: center
}

marquee {
background-color: #0000FF
}
```

8) Type notepad styled.html in command prompt.
9) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Red style</title>
<link rel="stylesheet" type="text/css" href="green.css">
</head>
<body>
<h1>Ridge TV Channel</h1>
<marquee>
Breaking news
        &nb
sp;   
Nothing new under the Sun!
        &nb
sp;   
Keep your cool!!
</marquee>
```

```
</body>
</html>
```

10) Open FireFox browser, press Ctrl+L and type the URL http://127.0.0.1/<name>/styled.html.
11) Verify that the page loads with green theme.
12) Change the line <link rel="stylesheet" type="text/css" href="green.css"> to **<link rel="stylesheet" type="text/css" href="red.css">.**
13) Verify that the page changed over to red theme.

## (5) To create HTML form for addition of numbers

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type CD c:\xampp\htdocs\<YOUR NAME>.
4) Type notepad add.html in command prompt.
5) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Add numbers</title>
<link rel=”stylesheet” type=”text/css” href=”red.css”>
</head>

<body>
<h1>Add form</h1>
<form name=”addForm” action=”#” method=”POST”>
<center>
<table border=0>
<tr><td>Enter x</td><td>:</td><td><input type=”text”
name=”x”></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type=”text”
name=”y”></td></tr>
```

```
<tr><td colspan=3 style="text-align:center"><input
type="button" value="Add" onClick="z.value =
Number(x.value) + Number(y.value)"></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="z" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

6) Open FireFox browser and enter the URL http://127.0.0.1/add.html.
7) Enter 2 numeric values against x and y.
8) Press Add button and verify that given numbers are correctly added.

## (6) To create HTML form for subtraction of numbers

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs\<NAME>**.
5) Type notepad sub.html in command prompt.
6) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Subtract numbers</title>
<link rel="stylesheet" type="text/css" href="red.css">
</head>

<body>
<h1>Subtract form</h1>
<form name="subForm" action="#" method="POST">
<center>
```

```
<table border=0>
<tr><td>Enter x</td><td>:</td><td><input type=”text”
name=”x”></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type=”text”
name=”y”></td></tr>
<tr><td colspan=3 style=”text-align:center”><input
type=”button” value=”Subtract” onClick=”z.value =
Number(x.value) – Number(y.value)”></td></tr>
<tr><td>Result</td><td>:</td><td><input type=”text”
name=”z”  readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

7) Open FireFox browser and enter the URL http://127.0.0.1/sub.html.

8) Enter 2 numeric values against x and y.

9) Press Subtract button and verify that given numbers are correctly subtracted.

## (7) To create HTML form for multiplication of numbers

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.

2) Open command prompt (Press Windows+R, type CMD and press enter).

3) Type **CD c:\xampp\htdocs\<NAME>**.

5) Type notepad mul.html in command prompt.

6) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Multiplication form</title>
<link rel="stylesheet" type="text/css" href="red.css">
</head>
```

```
<body>
<h1>Multiply form</h1>
<form name="mulForm" action="#" method="POST">
<center>
<table border=0>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan=3 style="text-align:center"><input
type="button" value="Multiply" onClick="z.value =
Number(x.value) * Number(y.value)"></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="z" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

7) Open FireFox browser and enter the URL http://127.0.0.1/mul.html.

8) Enter 2 numeric values against x and y.

9) Press Subtract button and verify that given numbers are correctly multiplied.

## (8) To create HTML form for division of numbers

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.

2) Open command prompt (Press Windows+R, type CMD and press enter).

3) Type CD c:\xampp\htdocs\<YOUR NAME>.

5) Type notepad div.html in command prompt.

6) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Division of numbers</title>
```

```
<link rel="stylesheet" type="text/css" href="red.css">
</head>

<body>
<h1>Division form</h1>
<form name="divForm" action="#" method="POST">
<center>
<table border=0>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan=3 style="text-align:center"><input
type="button" value="Divide" onClick="z.value =
Number(x.value) / Number(y.value)"></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="z" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

7) Open FireFox browser and enter the URL http://127.0.0.1/div.html.

8) Enter 2 numeric values against x and y.

9) Press Subtract button and verify that given numbers are correctly divided.

## (9) To create HTML form for age calculation

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.

2) Open command prompt (Press Windows+R, type CMD and press enter).

3) Type **CD c:\xampp\htdocs\<NAME>**.

5) Type notepad age.html in command prompt.

6) Type the following code, save the same and close notepad:

```
<html>
<head>
<title>Age calculation</title>
<link rel="stylesheet" type="text/css" href="green.css">
</head>
<body>
<h1>Age calculation</h1>
<form name="ageForm" action="#" method="POST">
<center>
<table border=0>
<tr><td>Enter DOB</td><td>:</td><td><input type="date"
name="dob"></td></tr>
<tr><td colspan=3 style="text-align:center"><input
type="button" value="Age" onClick="res.value = (new
Date(Date.now() - new
Date(dob.value).getTime()).getUTCFullYear()-
1970)"></td></tr>
<tr><td>Age</td><td>:</td><td><input type="text"
name="res" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

7) Open FireFox browser and enter the URL http://127.0.0.1/age.html.

8) Enter a date of birth.

9) Press Age button and verify that correct age is displayed.

## (10) To create PHP script for calculating power of a number

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.

2) Open command prompt (Press Windows+R, type CMD and press enter).

3) Type **CD c:\xampp\htdocs\<NAME>**.

5) Type notepad pow.php in command prompt.
6) Type the following code, save the same and close notepad:

```
<?php
$x = $_POST['x'];
$y = $_POST['y'];
$z = pow($x, $y);
echo $x . " ^ " . $y . " = " . $z;
?>
```

7) The working of this script can be verified only after creating a HTML form for the input of x and y.

## (11) To create HTML for to calculate power using PHP server side script

**PROCEDURE:**

1) Start Apache service using XAMPP control panel (Start->All Apps->XAMPP->XAMPP Control Panel.
2) Open command prompt (Press Windows+R, type CMD and press enter).
3) Type **CD c:\xampp\htdocs\<NAME>**.
5) Type notepad pow.html in command prompt.6) Type the following code, save the same and close notepad: **<html>**

```
<head>
<title>Power</title>
<link rel="stylesheet" type="text/css" href="green.css">
</head>
<body>
<h1>Power form</h1>
<form name="powForm" action="pow.php" method="POST">
<center>
<table border=0>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan=3 style="text-align:center"><input
type="submit" value="Power"> <input type="reset"
value="Reset"> </td></tr>
```

```
</table>
</center>
</form>
</body>
</html>
```

7) Open FireFox browser. Enter the URL http://127.0.0.1/<name>/pow.html.

8) Enter 2 numbers and press Power.

9) Verify that the PHP script sends the power value correctly.

## (12) To create a HTML/ Javascript program to add 2 numbers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad add.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Addition of numbers</title>
<link rel="stylesheet" href="red.css">
<script type="text/javascript" language="javascript">
function add(x,y) {
var z = Number(x) + Number(y);
document.getElementById("z").value = z;
}
</script>
</head>

<body>
<h1>Addition of numbers</h1>
<form name="addForm" method="POST" action="#">
<center>
<table>
```

```
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan="3"><center><input type="button" value="Add"
onClick="add(x.value,y.value)"></center></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text" name="z"
id="z" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/add.html.
7) Provide input values (256 for x and 145 for y). On pressing Add button, ensure that the result (401) appears correctly.
8) Javascript code is filled up using in-line coding style at the onClick option of the button (single line code).

## (13) To create a HTML/ Javascript program to subtract numbers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad sub.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Subtraction of numbers</title>
```

```
<link rel="stylesheet" href="red.css">
<script type="text/javascript" language="javascript">
function sub(x,y) {
var z = Number(x) - Number(y);
document.getElementById("z").value = z;
}
</script>
</head>

<body>
<h1>Subtraction of numbers</h1>
<form name="addForm" method="POST" action="#">
<center>
<table>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan="3"><center><input type="button"
value="Subtract"
onClick="sub(x.value,y.value)"></center></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="z" id="z" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/sub.html.
7) Provide input values (256 for x and 145 for y). On pressing Subtract button, ensure that the result (131) appears correctly.
8) If there is any error, press Ctrl+Shift+K. Firefox displays the list of errors. Read the error messages

one by one and rectify the mistakes in the HTML/ Javascript source file.

9) Press F5 or refresh button in FireFox to display the script after corrections.
10) Repeat the debugging process till the HTML/ Javascript works correctly.

---

## (14) To create a HTML/ Javascript program to multiply 2 numbers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad mult.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>
Multiplication of numbers
</title>
<style>
body {
background-color: #FFBBBB;
color: green;
}
</style>

<script type="text/javascript" language="javascript"
src="mult.js">
</script>

</head>
```

```
<body>
<form name="multForm" action="#" method="POST">
<center>
<h1>Form for multiplication of numbers</h1>
<table>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan="3"><center><input type="button"
value="Multiply" onClick="multFunc()"></center></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="res" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

6) Type **notepad mult.js**, press Yes button for confirmation to create new file, type the following Javascript code and save the contents:

```
function multFunc()
{
var x = document.multForm.x.value;
var y = document.multForm.y.value;
x = Number(x);
y = Number(y);
var z = x * y;
document.multForm.res.value = z;
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/mult.html.
8) Provide input values (12 for x and 15 for y). On pressing Multiply button, ensure that the result (300) appears correctly.
9) If there is any error, press Ctrl+Shift+K. Firefox displays the list of errors. Read the error messages one by one

and rectify the mistakes in the HTML/ Javascript source file.

10) Press F5 or refresh button in FireFox to display the script after corrections.
11) Repeat the debugging process till the HTML/ Javascript works correctly.

---

## (15) To create a HTML/ Javascript program for division of numbers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad div.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>
Division of numbers
</title>
<script type="text/javascript" language="javascript"
src="div.js">
</script>
</head>

<body style="background-color:#FFAAFF; color: blue">
<form name="divForm" action="#" method="POST">
<center>
<h1>Form for division of numbers</h1>
<table>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
```

```
<tr><td>Enter y</td><td>:</td><td><input type="text"
name="y"></td></tr>
<tr><td colspan="3"><center><input type="button"
value="Divide" onClick="divFunc()"></center></td></tr>
<tr><td>Result</td><td>:</td><td><input type="text"
name="res" readonly></td></tr>
</table>
</center>
</form>
</body>
</html>
```

6) Type **notepad mult.js**, press Yes button for confirmation to create new file, type the following Javascript code and save the contents:

```
function divFunc()
{
var x = document.divForm.x.value;
var y = document.divForm.y.value;
x = Number(x);
y = Number(y);
if(y == 0) {
        alert("Division by zero (0) is not permissible!");
        return;
        }
var z = x / y;
document.divForm.res.value = z;
}
```

12) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/div.html.
13) Provide input values (12 for x and 10 for y). On pressing Divide button, ensure that the result (1.2) appears correctly. If 0 provided against y, an error message should appear on pressing the Divide button.
14) If there is any error, press Ctrl+Shift+K. Firefox displays the list of errors. Read the error messages one by one and rectify the mistakes in the HTML/ Javascript source file.

15) Press F5 or refresh button in FireFox to display the script after corrections.
16) Repeat the debugging process till the HTML/ Javascript works correctly.

---

## (16) To create a HTML/ Javascript file to read out a single digit number (using if condition)

**PROCEDURE:4**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad read.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Read a single digit number</title>
<script type="text/javascript" language="javascript">
function readFunc()
{
var x = document.readForm.x.value;
x = Number(x);
if(x == 0)
        alert("zero");
else if(x == 1)
        alert("one");
else if(x == 2)
        alert("two");
else if(x == 3)
        alert("three");
else if(x == 4)
        alert("four");
else if(x == 5)
```

```
        alert("five");
else if(x == 6)
        alert("six");
else if(x == 7)
        alert("seven");
else if(x == 8)
        alert("eight");
else if(x == 9)
        alert("nine");
else alert("Enter only 0 to 9");
}
</script>
</head>
<body style="background-color:#66FFFF; color:red">
<form name="readForm" action="#" method="POST">
<center>
<h1>Read a single digit number</h1>
<table>
<tr><td>Enter x</td><td>:</td><td><input type="text"
name="x"></td></tr>
</table>
<input type="button" value="Read" onClick="readFunc()">
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/read.html.
7) This program uses if condition to read a single digit number. It also displays the result through an alert function rather than on a text field.
8) Enter a single digit number and verify that the result is displayed properly.
9) Verify that entering anything other than 0 to 9 displays an error message.

## (17) To create a HTML/ Javascript file to display a message based on age of a person (using if condition)

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad agemessage.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Age message</title>
<script type="text/javascript" language="javascript">
function ageFunc()
{
var age = document.ageForm.x.value;
age = Number(age);
if(age < 13)
        document.write("You are a kid!");
else if(age < 20)
        document.write("You are a teenager!");
else if(age < 30)
        document.write("You are young!");
else if(age < 40)
        document.write("You are middle aged!");
else
        document.write("You are quiet old!");
}
</script>
</head>
<body style="background-color:#66FFFF; color:red">
<form name="ageForm" action="#" method="POST">
<center>
<h1>Age message</h1>
```

```
<table>
<tr><td>Enter age</td><td>:</td><td><input type="text"
name="x"></td></tr>
</table>
<input type="button" value="Get Message"
onClick="ageFunc()">
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/agemessage.html.
7) This program uses if condition to display a message based on age of a person. It also uses document.write method to display the message.

## (18) To create a HTML/ Javascript file to display a message based on length of name of a person (using switch … case … default condition)

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad namelength.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Name message</title>
<script type="text/javascript" language="javascript">
function nameFunc()
{
var name = document.nameForm.name.value;
```

```
var len = name.length;
switch(len) {
case 1:
case 2:
case 3:
case 4:
case 5:
document.write("<h1 style='text-align:center; color:red'>Very
short name!</h1>");
break;
case 6:
case 7:
case 8:
case 9:
case 10:
document.write("<h1 style='text-align:center;
color:red'>Length of your name is normal!</h1>");
break;
case 11:
case 12:
case 13:
case 14:
case 15:
document.write("<h1 style='text-align:center;
color:red'>Length of your name is bit too long!</h1>");
break;
default:
document.write("<h1 style='text-align:center;
color:red'>Length of your name is too long!</h1>");
}
}
</script>
</head>
<body style="background-color:#66FFFF; color:red">
<form name="nameForm" action="#" method="POST">
<center>
<h1>Name message</h1>
```

```
<table>
<tr><td>Enter name</td><td>:</td><td><input type="text"
name="name"></td></tr>
</table>
<input type="button" value="Get Message"
onClick="nameFunc()">
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/namelength.html.
7) This program uses switch ... case ... default condition to display a message based on length of name of a person.

## (19) To create a HTML/ Javascript file to display a message based on Body Mass Index (using ternary operator ? :)

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad bmi.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Test of ternary</title>
<script type="text/javascript" language="javascript">
function bmiMessage() {
var wt = document.bmiForm.wt.value,
        ht=this.bmiForm.ht.value/100;
//BMI is weight in kg divided by square of height in metre
```

```
var bmi=wt/ht/ht;
var mess = "Your BMI is ";
mess += (bmi<=20.3)?"very good!":"very high. You need
exercise!"
document.getElementById("res").innerHTML="<h1
style='color:red'> "+mess+"</h1>";
}
</script>
</head>
<body>
<form name="bmiForm" action="#" method="POST">
<center>
<h1 style='color:red'>Body Mass Index Calculation</h1>
<table>
<tr><td>Enter weight</td><td>:</td> <td><input
type="number" name="wt"></td></tr>
<tr><td>Enter height in centi metre</td><td>:</td> <td>
<input type="number" name="ht"></td></tr>
</table>
<input type="button" value="BMI message"
onClick="bmiMessage()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/bmi.html.
7) This program uses ternary operator (? :), which puts a condition and a question mark, which is followed by two options for the condition being true and false (separated by a :).
8) The program displays very good for a person having BMI of 20.3 or less. Otherwise, it displays the message “Your BMI is very high. You need exercise.”

## (20) To create a HTML/ Javascript file to calculate sum of first N integers (using for loop)

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad sum.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Sum of first N numbers</title>
<script type="text/javascript" language="javascript">
function sumFunc()
{
var n = document.sumForm.n.value, sum=0;
n = Number(n);
for(var i=1; i<=n; i++) {
        sum += i;
        }
document.write("<h1 style='text-align:center; color:red'>Sum
of 1+2+..."+ n +" = "+sum+"</h1>");
}
</script>
</head>
<body style="background-color:#66FFFF; color:red">
<form name="sumForm" action="#" method="POST">
<center>
<h1>Sum of first N numbers</h1>
<table>
<tr><td>Enter number</td><td>:</td><td><input
type="number" name="n"></td></tr>
</table>
<input type="button" value="Sum" onClick="sumFunc()">
</center>
```

```
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/sum.html.
7) This program uses for loop to make the variable i to assume values from 1 to given number. For loop has 3 parts: declaration-initialization (var i=1), condition checking (i<=n) and increment (i++). Each part is separated by a semi-colon (;).

## (21) To create a HTML/ Javascript program to calculate factorial of given number (using for loop)

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad fact.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Factorial of given number</title>
<script type="text/javascript" language="javascript">
function factFunc()
{
var n = document.factForm.n.value, fact=1;
n = Number(n);

for(var i=2; i<=n; i++) {
        fact *= i;
        }
```

```
document.factForm.res.value = fact;
}
</script>
</head>
<body style="background-color:#66FFFF; color:red">
<form name="factForm" action="#" method="POST">
<center>
<h1>Factorial of given number</h1>
<table>
<tr><td>Enter number</td><td>:</td><td><input
type="number" name="n"></td></tr>
<tr><td colspan=3><center><input type="button"
value="Sum" onClick="factFunc()"></center></td></tr>
<tr><td>Factorial</td><td>:</td><td><input type="text"
name="res"></td></tr>
</table>

</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/fact.html.
7) This program uses for loop to make the variable i to assume values from 1 to given number. For loop has 3 parts: declaration-initialization (var i=2), condition checking (i<=n) and increment (i++). Each part is separated by a semi-colon (;).
8) Factorial is the multiplication result of all integers between 1 and N (1 x 2 x … x N).

## (22) To create a HTML/ Javascript program to display hexadecimal symbol for decimal number (using array).

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.

2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad hex.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title></title>
<script>
function hexFunc()
{
var hex = ['0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'];
var x = document.arrayFrm.x.value;
x = Number(x);
if(x<16)
        document.getElementById("res").innerHTML = "<h1
style='color:green'> "+x+
                "<sub>10</sub> = "+hex[x]+"<sub>16</sub>";
else
        document.getElementById("res").innerHTML = "<h1
style='color:red'>Input should be in the range of 0 to 15</h1>
";
}
</script>
</head>
<body>
<form name="arrayFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Get hexa code for decimal number (<
16)</h1>
<table>
<tr><td>Enter a number (<16)</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Hex code" onClick="hexFunc()">
```

```
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/hex.html.
7) An array is declared and initialized inside a square bracket. Index values from 0 to 15 are used to retrieve hexadecimal symbols.

## (23) To create a HTML/ Javascript program to sum and average of given numbers (using split function and array).

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad avg.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title></title>
<script>
function avgFunc()
{
var x = document.avgFrm.x.value.split(" ");
var sum = 0;
for(var k in x) {
        sum += Number(x[k]);
        }
var avg = sum/x.length;
```

```
document.getElementById("res").innerHTML = "<h1 style='color:green'> sum: "+sum+"<br />";
document.getElementById("res").innerHTML += "Number of elements: "+x.length+"<br />";
document.getElementById("res").innerHTML +="Average: "+avg+"</h1>";
}
</script>
</head>
<body>
<form name="avgFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Sum and average of numbers</h1>
<table>
<tr><td>Enter numbers (space separated)</td><td>:</td><td><input type="text" name="x"></td></tr>
</table>
<input type="button" value="Average" onClick="avgFunc()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/avg.html.
7) The string input is divided in to array elements on occurrence of space character.
8) Array elements are summed up using for ... in loop, which iterates through each index element of array.

## (24) To test whether given number is Armstrong number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.

2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad armstrong.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>
To test given number for Armstrong number
</title>
<script>

function armstrong(x)
{
var digit, sum=0, y=x;

while(y > 0) {
        digit = y % 10;
        sum += Math.pow(digit,3);
        y = (y - digit)/10;
        }
if(sum == x)
        alert(x + " is an Armstrong number!");
else
        alert(x + " is not an Armstrong number!");

}
</script>

</head>

<body>
<center>
<form name="armstrongFrom" action="#" method="POST">
<h1>To test given number for Armstrong number</h1>
```

```
<table>
<tr><td>Enter number</td><td>:</td><td><input type="text"
name="x"></td></tr>
</table>
<input type="button" value="Check Armstrong"
onClick="armstrong(x.value)">
</form>

</center>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/armstrong.html.
7) Enter any number. It displays whether it is Armstrong or not. As a sample case, number 153 is an Armstrong number.

## (25) To check whether given string is Palindrome

**PROCEDURE:**

8) Start XAMPP control panel. Start Apache server.
9) Open command prompt (Press Windows+R, type **cmd** and press Enter).
10) Type cd \xampp\htdocs\<your folder>.
11) Type **notepad palindrome.html**. Choose YES when notepad seeks confirmation to create a new file.
12) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>
To test given string is palyndrome
</title>
<script>

function paly(x)
{
var c, paly=true, len=x.length, i=0;

while(paly==true && i<len/2) {
        if(x.charAt(i) != x.charAt(len-i-1))
                paly = false;
        i++;
        }
if(paly == true)
        alert(x + " is Palyndrome!");
else
        alert(x + " is not a Palyndrome!");

}
</script>

</head>

<body>
```

```
<center>
<form name="armstrongFrom" action="#" method="POST">
<h1>To test given string for Palindrome</h1>
<table>
<tr><td>Enter a string/ number</td><td>:</td><td><input type="text" name="x"></td></tr>
</table>
<input type="button" value="Check Palindrome" onClick="paly(x.value)">
</form>

</center>
</body>
</html>
```

13) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/palindrome.html.
14) Enter a number or string which is symmetric (like 12721) and check whether it says Palindrome. Enter some asymmetric string and test whether it says not a palindrome.

## (26) To create a HTML/ Javascript program to display marks using associative array.

**PROCEDURE:**

15) Start XAMPP control panel. Start Apache server.
16) Open command prompt (Press Windows+R, type **cmd** and press Enter).
17) Type cd \xampp\htdocs\<your folder>.
18) Type **notepad mark.html**. Choose YES when notepad seeks confirmation to create a new file.
19) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title></title>
</head>
```

```
<body>
<span id="res"></span>
<script>
var x = {'Tamil':90, 'English':97, 'Maths':100, 'Science':100, 'Social':96};
var total = 0;
document.write( "<h1 style='color:green'> Mark statement</h1>");
var i=1;
document.write("<table border=1><tr><th>Sl. No.</th><th>Subject</th><th>Mark</th></tr>");
for(var s in x) {
        document.write("<tr><td>"+i+"</td><td>"+s+"</td><td style='text-align:right'>"+x[s]+"</td></tr>");
        total += Number(x[s]);
        i++;
        }
document.write("<tr><td colspan=2 style='color:red; text-align:center; font-weight:bold'>Total</td><td style='color:red;font-weight:bold; text-align:right'>"+total+"</td></tr>");
document.write("</table>");
</script>
</body>
</html>
```

20) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/mark.html.
21) Array elements are summed up using for ... in loop, which iterates through each index element of array. Instead of a numeric index, the array uses string (subject name) for key.

## (27) To create a HTML/ Javascript program to display multiplication table using for loop.

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.

2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad table.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title></title>
<script type="text/javascript" language="javascript">
function tableFunc() {
var x = prompt("Which table?");
x = Number(x);
document.write("<table>");
for(var i=1; i<=10; i++) {
        var res = x*i;
        document.write("<tr><td>"+i+"</td><td>x</td><td>"+
x+"</td><td>=</td><td>"+res+"</td></tr>");
        }
document.write("</table>");
}
</script>
</head>
<body>
<center>
<input type="button" value="Table" onClick="tableFunc()">
</center>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/table.html.
7) Table elements are displayed using for loop having an index i which changes from 1 to 10.

## (28) To create a HTML/ Javascript program to display Fibonacci numbers using while loop.

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad fibo.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Fibonacci series</title>
<script type="text/javascript" language="javascript">
function fiboFunc()
{
var i, x=1, y=1, tmp, n=Number(this.fiboFrm.n.value);
var str = "<h1 style='color:green'>";
if(n==1)
        str += x+"<br />";
else if (n>=2)
        str += x+"<br />"+y+"<br />";
i=3;
while(i<n) {
        tmp = x+y;
        x = y;
        y = tmp;
        str += y+"<br />";
        i++;
        }
str += "</h1>";
document.getElementById("res").innerHTML = str;
}
</script>
</head>
<body>
```

```
<form name="fiboFrm" action="#" method="POST">
<center>
<h1 style="color:red">Fibonacci numbers</h1>
<table>
<tr><td>Enter number of terms</td><td>:</td>
<td><input type="text" name="n"></td></tr>
</table>
<input type="button" value="Display"
onClick="fiboFunc()"><br>
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/fibo.html.
7) If the number of elements required is 1 or 2, the if condition displays the result. When the number of elements is more than 2, while loop adds x and y, assigns the result to a temporary variable named tmp. It then assigns value of y to x, value of tmp to y and displays y.

## (29) To create a HTML/ Javascript program for evaluation of expressions (using do … while loop).

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad calc.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
```

```
<title>Calculation of expression</title>
</head>
<body>
<script type="text/javascript" language="javascript">
var oneMore = true;
do {
        var expr = prompt("Enter mathematical expression");
        res = eval(expr);
        alert(res);
        oneMore = confirm("Do you wish to continue
evaluation?");
        } while(oneMore == true);
</script>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/calc.html.
7) This program uses prompt function to get input, alert function to display result and confirm function to get choose whether continuation is required.

## (30) To convert decimal number to binary number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad dec2bin.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Decimal to binary</title>
<script type="text/javascript" language="javascript">
function dec2binFunc() {
```

```
var x = document.dec2binFrm.x.value;
var base=2, rem;
var result = "";
while(x>0) {
        rem = x%base;
        result = ""+rem+result;
        x = (x-rem)/base;
        }
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+document.dec2binFrm.x.value+"<sub>1
0</sub> = "+result+"<sub>2</sub></h1>";
}
</script>
</head>
<body>
<form name="dec2binFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Decimal to binary</h1>
<table>
<tr><td>Enter decimal number</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Convert"
onClick="dec2binFunc()">
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/dec2bin.html.
7) Given decimal number is converted to binary by successive division using 2 (the target base number).

## (31) To convert binary number to decimal number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.

2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad bin2dec.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Binary to decimal</title>
<script type="text/javascript" language="javascript">
function bin2decFunc() {
var x = document.bin2decFrm.x.value;
var base=2, rem;
var result = 0;
var i=0;
while(x>0) {
        rem = x%base;
        result += rem*Math.pow(base,i++);
        x = (x-rem)/10;
        }
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+document.bin2decFrm.x.value+"<sub>2
</sub> = "+result+"<sub>10</sub></h1>";
}
</script>
</head>
<body>
<form name="bin2decFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Binary to decimal</h1>
<table>
<tr><td>Enter binary number</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Convert"
onClick="bin2decFunc()">
```

```
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/bin2dec.html.
7) Given binary number is converted to decimal number by multiplication of the last digit of binary using 2 raised to power place value (0,1,2,3,...).
8) The product is added to result.
9) The integer remainder of division by 2 is used as the new number to apply steps 7 and 8.

## (32) To convert decimal number to octal number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad dec2oct.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Decimal to octal</title>
<script type="text/javascript" language="javascript">
function dec2octFunc() {
var x = document.dec2octFrm.x.value;
var num = x;
var base=8, rem;
var result = "";
while(x>0) {
        rem = x%base;
        result = ""+rem+result;
        x = (x-rem)/base;
        }
```

```
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+num+"<sub>10</sub> =
"+result+"<sub>"+base+"</sub></h1>";
}
</script>
</head>
<body>
<form name="dec2octFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Decimal to octal</h1>
<table>
<tr><td>Enter decimal number</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Convert"
onClick="dec2octFunc()">
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/dec2oct.html.
7) Given decimal number is converted to binary by successive division using 8 (the target base number) and the integer remainder is used for next iteration.

## (33) To convert octal number to decimal number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad oct2dec.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Octal to decimal</title>
<script type="text/javascript" language="javascript">
function oct2decFunc() {
var x = document.oct2decFrm.x.value;
var num = x;
var base=8, rem;
var result = 0;
var i=0;
while(x>0) {
        rem = x%10;
        result += rem*Math.pow(base,i++);
        x = (x-rem)/10;
        }
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+num+"<sub>"+base+"</sub> =
"+result+"<sub>10</sub></h1>";
}
</script>
</head>
<body>
<form name="oct2decFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Octal to decimal</h1>
<table>
<tr><td>Enter binary number</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Convert"
onClick="oct2decFunc()">
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/oct2dec.html.

7) Given octal number is converted to decimal number by multiplication of the last digit of octal using 8 raised to the power of place value (0,1,2,3,...).
8) The product is added to the result.
9) The integer remainder of division using 8 is used as the new number for applying steps 7 and 8.

## (34) To convert decimal number to hexadecimal number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad dec2hex.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Decimal to hexadecimal</title>
<script type="text/javascript" language="javascript">
function dec2hexFunc() {
var hexChar =
['0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'];
var x = document.dec2hexFrm.x.value;
var num = x;
var base=16, rem;
var result = "";
while(x>0) {
        rem = x%base;
        result = ""+hexChar[rem]+result;
        x = (x-rem)/base;
        }
```

```
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+num+"<sub>10</sub> =
"+result+"<sub>"+base+"</sub></h1>";
}
</script>
</head>
<body>
<form name="dec2hexFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Decimal to hexadecimal</h1>
<table>
<tr><td>Enter decimal number</td><td>:</td><td><input
type="number" name="x"></td></tr>
</table>
<input type="button" value="Convert"
onClick="dec2hexFunc()">
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/dec2oct.html.
7) Given decimal number is converted to binary by successive division using 16 (the target base number).
8) An array named hexChar contains the hexadecimal values from 0 to F.
9) The integer remainder of division by 16 (may range from 0 to 15) is placed in the index of hexChar array to get equivalent hexadecimal digit.

## (35) To convert hexadecimal number to decimal number

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.

4) Type **notepad hex2dec.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Hexal to decimal</title>
<script type="text/javascript" language="javascript">
function hex2decFunc() {
var hexChar =
['0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'];
var x = document.hex2decFrm.x.value;
var num = x;
var base=16, rem;
var result = 0;
var i=0;
while(x.length>0) {
        rem = x.charAt(x.length-1);
        rem = hexChar.indexOf(rem);
        result += rem*Math.pow(base,i++);
        x = x.substring(0,x.length-1);
        }
document.getElementById("res").innerHTML = "<h1
style='color:green'>"+num+"<sub>"+base+"</sub> =
"+result+"<sub>10</sub></h1>";
}
</script>
</head>
<body>
<form name="hex2decFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Hexal to decimal</h1>
<table>
<tr><td>Enter binary number</td><td>:</td><td><input
type="text" name="x"></td></tr>
</table>
```

```
<input type="button" value="Convert"
onClick="hex2decFunc()">
<span id="res"></span>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/hex2dec.html.
7) Given hexadecimal number is converted to decimal number by multiplication of the last digit using 16 raised to power of place value (0, 1, 2, ...).
8) The hexadecimal digit (0 ... F) is converted to decimal number by calling indexOf method on the array hexChar which contains hexadecimal digits from 0 to F.
9) The product of multiplication is added to the result.
10) The last digit of the hexadecimal number is removed (using substring function) to get the new number iteration of for steps 7 to 9.

## (36) To create a HTML/ Javascript program for using string functions

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad str.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>String functions, Part 1</title>
<script type="text/javascript" language="javascript">
function strFunc() {
var str = this.strFrm.str.value;
```

```
var option = document.strFrm.strFnOpt.value;
var result = "<h1 style='color:green'>";
switch(option) {
        case "charAt":
                var x = prompt("Enter location for charAt");
                result += str.charAt(x)+"</h1>";
                break;
        case "charCodeAt":
                var x = prompt("Enter location for charCodeAt");
                result += str.charCodeAt(x)+"</h1>";
                break;
        case "concat":
                var x = prompt("Enter second string");
                result += str.concat(x)+"</h1>";
                break;
        case "indexOf":
                var x = prompt("Enter the secondary string for
search index");
                result += str.indexOf(x)+"</h1>";
                break;
        case "lastIndexOf":
                var x = prompt("Enter the secondary string for
search index");
                result += str.lastIndexOf(x)+"</h1>";
                break;
        case "localeCompare":
                var x = prompt("Enter the second string");
                result += str.localeCompare(x)+"</h1>";
                break;
        case "length":
                result += str.length+"</h1>";
                break;
        case "match":
                var x = prompt("What to match?");
                result += str.match(x)+"</h1>";
                break;
        case "replace":
```

```
            var x = prompt("Search string");
            var y = prompt("Replacement string");
            result += str.replace(x, y)+"</h1>";
            break;
        case "replace":
            var x = prompt("Search string");
            var y = prompt("Replacement string");
            result += str.replace(x, y)+"</h1>";
            break;
        case "search":
            var x = prompt("Search string");
            result += str.search(x)+"</h1>";
            break;
        case "slice":
            var x = prompt("Start point of slice");
            var y = prompt("No. of characters to slide");
            result += str.slice(x, y)+"</h1>";
            break;
        case "substr":
            var x = prompt("Start point of substr");
            var y = prompt("No. of characters to substr");
            result += str.substr(x, y)+"</h1>";
            break;
        case "substring":
            var x = prompt("Start point of substring");
            var y = prompt("End point of substring");
            result += str.substring(x, y)+"</h1>";
            break;
        case "toLowerCase":
            result += str.toLowerCase()+"</h1>";
            break;
        case "toUpperCase":
            result += str.toUpperCase()+"</h1>";
            break;
        case "trim":
            result += "::"+str.trim()+"::</h1>";
            break;
```

```
        case "trimLeft":
                result += "::"+str.trimLeft()+"::</h1>";
                break;
        case "trimRight":
                result += "::"+str.trimRight()+"::</h1>";
                break;

        }
document.getElementById("res").innerHTML = result;
}
</script>
</head>
<body>
<form name="strFrm" action="#" method="POST">
<center>
<h1 style="color:red">String functions, Part 1</h1>
<table>
<tr><td>Input   string</td><td>:</td><td><input   type="text"
name="str"></td></tr>
<tr><td>Select function</td><td>:</td><td>
<select name="strFnOpt">
<option value="charAt">charAt</option>
<option value="charCodeAt">charCodeAt</option>
<option value="concat">concat</option>
<option value="indexOf">indexOf</option>
<option value="lastIndexOf">lastIndexOf</option>
<option value="localeCompare">localeCompare</option>
<option value="length">length</option>
<option value="match">match</option>
<option value="replace">replace</option>
<option value="search">search</option>
<option value="slice">slice</option>
<option value="substr">substr</option>
<option value="substring">substring</option>
<option value="toLowerCase">toLowerCase</option>
<option value="toUpperCase">toUpperCase</option>
<option value="trim">trim</option>
```

```
<option value="trimLeft">trimLeft</option>
<option value="trimRight">trimRight</option>
</select>
</td></tr>
</table>
<input type="button" value="Process" onClick="strFunc()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/str.html.

## (37) To control document colors using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad color.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Color selection</title>
<script type="text/javascript" language="javascript">
function setColor()
{
document.bgColor = document.colorFrm.bg.value;
document.getElementById("header").style.color =
document.colorFrm.tc.value;
document.fgColor = document.colorFrm.txt.value;
}
</script>
```

```
</head>
<body>
<form name="colorFrm" action="#" method="POST">
<center>
<span id="header"><h1>Color selection</h1></span>
<table>
<tr><td>Background color</td><td>:</td>
<td><input type="color" name="bg"></td></tr>
<tr><td>Title color</td><td>:</td>
<td><input type="color" name="tc"></td></tr>
<tr><td>Text color</td><td>:</td>
<td><input type="color" name="txt"></td></tr>
</table>
<input type="button" value="Apply" onClick="setColor()">
</center>
</form>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/color.html.
7) Input type of **color** in HTML displays a button on clicking which a color selection dialog.
8) Background color may be set using document.bgColor, foreground color may be set using document.fgColor.
9) Selected colour is accessible through value property of input object.

## (38) To use math functions in Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad math.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Math functions in Javascript</title>
<script type="text/javascript" language="javascript" src="math.js">
</script>
</head>
<body style="background:#CCFFCC; color:red; font-size:150%">
<form name="mathFrm" action="#" method="POST">
<center>
<h1 style="text-align:center;color:blue">Math functions</h1>
<table>
<tr><td>Enter a number</td><td>:</td><td><input type="text" name="x"></td></tr>
</table>
<input type="radio" name="mathOpt" value="abs">abs
<input type="radio" name="mathOpt" value="acos">acos<br />
<input type="radio" name="mathOpt" value="acosh">acosh
<input type="radio" name="mathOpt" value="asin">asin<br />
<input type="radio" name="mathOpt" value="asinh">asinh
<input type="radio" name="mathOpt" value="atan">atan<br />
<input type="radio" name="mathOpt" value="atan2">atan2
<input type="radio" name="mathOpt" value="atanh">atanh<br />
<input type="radio" name="mathOpt" value="cbrt">cbrt
<input type="radio" name="mathOpt" value="ceil">ceil<br />
<input type="radio" name="mathOpt" value="cos">cos
<input type="radio" name="mathOpt" value="cosh">cosh<br />
<input type="radio" name="mathOpt" value="exp">exp
<input type="radio" name="mathOpt" value="floor">floor<br />
<input type="radio" name="mathOpt" value="log">log
```

```
<input type="radio" name="mathOpt" value="max">max<br />
<input type="radio" name="mathOpt" value="min">min
<input type="radio" name="mathOpt" value="pow">pow<br />
<input type="radio" name="mathOpt" value="random">random
<input type="radio" name="mathOpt" value="round">round<br />
<input type="radio" name="mathOpt" value="sin">sin
<input type="radio" name="mathOpt" value="sinh">sinh<br />
<input type="radio" name="mathOpt" value="sqrt">sqrt
<input type="radio" name="mathOpt" value="tan">tan
<input type="radio" name="mathOpt" value="trunc">trunc<br />
<input type="button" value="Calculate" onClick="mathFunc()"><br />
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the HTML content, type **notepad math.js**. Choose YES to create a new file. Type the following code and save:

```
function mathFunc()
{
var choice = document.mathFrm.mathOpt.value;
var x = document.mathFrm.x.value;

switch(choice) {
        case "abs": //No additional parameter
                var r = Math.abs(x);
                document.getElementById("res").innerHTML = "<h1 style='color:red'>Math.abs("+x+") = "+r+"</h1>";
```

```
                break;
        case "acos": //No additional parameter
                var r = Math.acos(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.acos("+x+") = "+r+"</h1>";
                break;
        case "acosh": //No additional parameter
                var r = Math.acosh(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.acosh("+x+") = "+r+"</h1>";
                break;
        case "asin": //No additional parameter
                var r = Math.asin(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.asin("+x+") = "+r+"</h1>";
                break;
        case "asinh": //No additional parameter
                var r = Math.asinh(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.asinh("+x+") = "+r+"</h1>";
                break;
        case "atan": //No additional parameter
                var r = Math.atan(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.atan("+x+") = "+r+"</h1>";
                break;
        case "atan2": //No additional parameter
                var y = prompt("Enter y for atan2");
                var r = Math.atan2(x,y)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.asin("+x+") = "+r+"</h1>";
                break;
        case "atanh": //No additional parameter
                var r = Math.atanh(x)*180/Math.PI;
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.atanh("+x+") = "+r+"</h1>";
                break;
```

```
        case "cbrt": //No additional parameter
                var r = Math.cbrt(x);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.cbrt("+x+") = "+r+"</h1>";
                break;
        case "ceil": //No additional parameter
                var r = Math.ceil(x);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.ceil("+x+") = "+r+"</h1>";
                break;
        case "cos": //No additional parameter
                var r = Math.cos(x*Math.PI/180);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.cos("+x+") = "+r+"</h1>";
                break;
        case "cosh": //No additional parameter
                var r = Math.cosh(x*Math.PI/180);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.cosh("+x+") = "+r+"</h1>";
                break;
        case "exp": //No additional parameter
                var r = Math.exp(x);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.exp("+x+") = "+r+"</h1>";
                break;
        case "floor": //No additional parameter
                var r = Math.floor(x);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.floor("+x+") = "+r+"</h1>";
                break;
        case "log": //No additional parameter
                var r = Math.log(x);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.floor("+x+") = "+r+"</h1>";
                break;
        case "max": //3 additional parameter
                var y = prompt("Number for max"),
```

```
                        z=prompt("Number for max"),
a=prompt("Number for max");
                var r = Math.max(x, y, z, a);
                document.getElementById("res").innerHTML =
                        "<h1
style='color:red'>Math.abs("+x+","+y+","+z+","+a+") =
"+r+"</h1>";
                break;
        case "min": //3 additional parameter
                var y = prompt("Number for min"),
                        z=prompt("Number for min"),
a=prompt("Number for min");
                var r = Math.max(x, y, z, a);
                document.getElementById("res").innerHTML =
                        "<h1
style='color:red'>Math.min("+x+","+y+","+z+","+a+") =
"+r+"</h1>";
                break;
        case "pow": //One additional parameter
                var y = prompt("Enter power");
                var r = Math.pow(x,y);
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.pow("+x+","+y+") = "+r+"</h1>";
                break;
        case "random": //No additional parameter
                var r = Math.random();
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.random() = "+r+"</h1>";
                break;
        case "round": //No additional parameter
                var r = Math.round();
                document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.round() = "+r+"</h1>";
                break;
        case "sin": //No additional parameter
                var r = Math.sin(x*Math.PI/180);
```

```
                    document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.sin("+x+") = "+r+"</h1>";
                    break;
          case "sinh": //No additional parameter
                    var r = Math.sinh(x*Math.PI/180);
                    document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.sinh("+x+") = "+r+"</h1>";
                    break;
          case "sqrt": //No additional parameter
                    var r = Math.sqrt(x);
                    document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.sqrt("+x+") = "+r+"</h1>";
                    break;
          case "tan": //No additional parameter
                    var r = Math.tan(x*Math.PI/180);
                    document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.tan("+x+") = "+r+"</h1>";
                    break;
          case "trunc": //No additional parameter
                    var r = Math.trunc(x);
                    document.getElementById("res").innerHTML =
"<h1 style='color:red'>Math.trunc("+x+") = "+r+"</h1>";
                    break;
          }
}
```

7) The above Javascript file provides Math implementation for just a few functions. Apply your mind to create code for all Math functions.
8) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/math.html.
9) Enter a number in the input text box. Choose a function from radio buttons. Press Calculate.
10) Verify the result displayed against standard results. Make corrections if necessary.

## (39) To calculate sum of squares of series of Integers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad sumsq.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Sum of squares of first N numbers</title>
<script type="text/javascript" language="javascript" src="sumsq.js"></script>
</head>
<body style="background:#FFCCCC; color:blue">
<form name="sqFrm" action="#" method="POST">
<center>
<h1>Sum of squares of first N numbers</h1>
<table>
<tr><td>Enter N</td><td>:</td><td><input type="text" name="n"></td></tr>
</table>
<input type="button" value="Sum of square" onClick="sumSq()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the HTML content, type **notepad math.js**. Choose YES to create a new file. Type the following code and save:

```
function sumSq()
{
var n = Number(document.sqFrm.n.value);
```

```
var sum = 0;
for(var i=1; i<=n; i++)
        sum += Math.pow(i,2);
document.getElementById("res").innerHTML = "<h1 style='color:green'>1<sup>2</sup>+...+"+n+"<sup>2</sup> = "+sum+"</h1>";
}
```

7) The above Javascript file provides code for calculating the sum of squares of first N integers using Math.pow function.
8) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/sumsq.html.
9) Enter a number in the input text box. On pressing Calculate sum of squares button, sumSq function is invoked to calculate the result.
10) Verify the result displayed against standard results.

## (40) To calculate sum of cubes of series of Integers

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad sumcb.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Sum of cubes of first N numbers</title>
<script type="text/javascript" language="javascript" src="sumcb.js"></script>
</head>
<body style="background:#FFCCCC; color:blue">
<form name="cbFrm" action="#" method="POST">
<center>
```

```
<h1>Sum of cubes of first N numbers</h1>
<table>
<tr><td>Enter N</td><td>:</td><td><input type="text" name="n"></td></tr>
</table>
<input type="button" value="Sum of cubes" onClick="sumCb()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) After typing the HTML content, type **notepad subcb.js**. Choose YES to create a new file. Type the following code and save:

```
function sumCb()
{
var n = Number(document.cbFrm.n.value);
var sum = 0;
for(var i=1; i<=n; i++)
        sum += Math.pow(i,3);
document.getElementById("res").innerHTML = "<h1 style='color:green'>1<sup>3</sup>+...+"+n+"<sup>3</sup> = "+sum+"</h1>";
}
```

7) The above Javascript file provides code for calculating the sum of cubes of first N integers using Math.pow function.
8) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/sumcb.html.
9) Enter a number in the input text box. On pressing Calculate sum of cubes button, sumCb function is invoked to calculate the result.
10) Verify the result displayed against standard results.

## (41) To display digital clock

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad digiclock.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Digital clock</title>
<script type="text/javascript" language="javascript">
function digiClock()
{
var dt = new Date();
var h = dt.getHours(), m = dt.getMinutes(), s = dt.getSeconds();
var time = "<h1 style='font-size:400%'><span style='color:red'>"+h+
        "h: </span><span style='color:blue'>"+m+
        "m: </span><span style='color:green'>"+s+"s</span></h1>";
document.getElementById("digi").innerHTML = time;
}
</script>
</head>
<body>
<center>
<span id="digi"></span>
</center>
<script type="text/javascript" language="javascript">
setInterval(digiClock,1000);
</script>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/digiclock.html.
7) The setInterval method in body section invokes digiClock function every 1000 milliseconds (1 second).
8) The digiClock function creates a date object named dt and uses getHours, getMinutes and getSeconds functions to extract hour, minute and seconds of time.

## (42) To display digital stop watch

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad stopwatch.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Stop watch</title>
<script type="text/javascript" language="javascript" src="stopwatch.js">
</script>
</head>
<body>
<center>
<h1 style="color:red">Stop watch</h1>
<span id="time"></span>
<input type="button" value="Start" onClick="start()">
<input type="button" value="Stop" onClick="stop()">
</center>
</body>
</html>
```

6) Then, type notepad stopwatch.js in the command prompt, enter the following script and save the file:

```
var run = null;
var time = 0;

function clock() {
var tm = new Date();
var i = tm.getTime() - time;
var ms = i%1000;
i-=ms;
var s = (i/1000)%60;
i-=s*1000;
var m = (i/1000/60)%60;
i-=m*60*1000;
var h = i/1000/60/60;
document.getElementById("time").innerHTML = "<h1><span
style='color:blue;'>"+h+
        "h: </span><span style='color:green'>"+m+"m:
</span><span style='color:red'>"+
        s+"."+ms+"s</span></h1>";
}

function start()
{
time = new Date().getTime();
run = setInterval(clock, 1);
}

function stop()
{
clearInterval(run);
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/stopwatch.html.
8) The setInterval method in body section invokes clock function every milliseconds (1/1000 of a second).
9) The start function saves the start time in variable named time.

10) The clock function calculates the difference between current time and start time, converts the interval (in milliseconds) to milliseconds, seconds, minutes and hours and displays the same.

## (43) To display results of Date functions in Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad date.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Date functions</title>
<script type="text/javascript" language="javascript" src="date.js">
</script>
</head>
<body style="background:#AAFFAA">
<form name="dtFrm" action="#" method="POST">
<center>
<h1 style="color:red">Time functions</h1>
<select name="dtOpt" size="4">
<option value="getDate">getDate</option>
<option value="getDay">getDay</option>
<option value="getFullYear">getFullYear</option>
<option value="getHours">getHours</option>
<option value="getMilliseconds">getMilliseconds</option>
<option value="getMinutes">getMinutes</option>
<option value="getMonth">getMonth</option>
<option value="getSeconds">getSeconds</option>
<option value="getTime">getTime</option>
```

```
<option
value="getTimezoneOffset">getTimezoneOffset</option>
<option value="getUTCDate">getUTCDate</option>
<option value="getUTCFullYear">getUTCFullYear</option>
<option value="getUTCHours">getUTCHours</option>
<option value="getUTCSeconds">getUTCSeconds</option>
<option value="getYear">getYear</option>
<option value="toDateString">toDateString</option>
<option value="toLocaleString">toLocaleString</option>
<option value="toString">toString</option>
</select><br />
<input type="button" value="Process"
onClick="process()"><br />
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) Then, type **notepad date.js** in the command prompt, enter the following script and save the file:

```
function process()
{
var opt = document.dtFrm.dtOpt.value;
var d = new Date();
var s = "<h1 style='color:red'>";
switch(opt) {
        case "getDate":
                s += d.getDate()+"</h1>";
                break;
        case "getDay":
                s += d.getDay()+"</h1>";
                break;
        case "getFullYear":
                s += d.getFullYear()+"</h1>";
                break;
        }
document.getElementById("res").innerHTML = s;
```

***}***

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/date.html.
8) Select a function from the list of date functions.
9) Click the Process button.
10) Verify that appropriate values are displayed on screen.

## (44) Arithmetic operators in Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad operator.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Operators in Javascript</title>
</head>
<body>
<script type="text/javascript" language="javascript">
var i=5;
alert("Initial value of i: "+i);
alert("i with postfix increment: "+ i++); // i becomes 6 at the end of line
alert("i with prefix increment: "+ ++i); // i becomes 7 at the beginning of line
i+=12;// i becomes 19; because 7+12 = 19
alert("i += 12: "+ i);
i-=4; // i becomes 15; because 19-4 = 15
alert("i -= 4: "+ i);
i*=5; // i becomes 75; because 15*5 = 75
alert("i *= 5: "+ i);
i/=25; // i becomes 3; because 75/25 = 3
```

```
alert("i /= 25: "+ i);
i**=2; // i becomes 9; because 3^2 = 9
alert("i **= 2: "+ i);
var res = i=="9"; // Compare the values and data types of i and "9". It is false.
alert("i=='9': "+res);
res = i=="9"; // Compare just the values of i and "9". It is true.
alert("i==\"9\": "+res);
</script>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/operator.html.
7) A series messages appears to show the current value of variable i after the application of several operators.

## (45) Responding to mouse gestures using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad changer.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>I change as you move</title>
<script type="text/javascript" language="javascript">
function enter() {
document.getElementById("flower").src = "b1.jpg";
}
function exit() {
document.getElementById("flower").src = "b2.jpg";
}
```

```
function click() {
document.getElementById("flower").src = "b3jpg";
}
function dblClick() {
document.getElementById("flower").src = "b4.jpg";
}

</script>
</head>
<body>
<center>
<img width="100%" height="100%" id="flower" src="b5.jpg"
        onDblClick="dblClick()"
        onMouseOver="enter()"
        onMouseOut="exit()"
        onClick="click()"
        >
</center>
</body>
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/changer.html.
7) The image of a garden appears by default. When the mouse enters, click or double clicks, the image changes according to the gesture.

## (46) To display a gallery of images using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad gallery.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<html>
<title>Image gallery</title>
<script>
var i=1;
var interval = 1000;
var tmp = null;

function timing() {
if(tmp != null)
        clearInterval(tmp);
tmp = setInterval(galFunction,
document.getElementById("delay").value);
}

function galFunction() {
document.getElementById("gallery").src = (i++)+".jpg";
i%=13;
if(i==0)
        i=1;
}
</script>
</html>
<body>
<center>
<input type="number" id="delay" value=1000>
<input type="button" value="Change timing"
onClick="timing()">
<img width="100%" height="90%" src="1.jpg" id="gallery">

<script type="text/javascript" language="javascript">
timing();
</script>
</center>
</body>
```

```
</html>
```

6) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/gallery.html.
7) Adjust the time day in milliseconds. Press the Change timing button. Verify that the gallery changes images at specified interval.

## (47) To draw shapes and text using Canvas object

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad draw.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Draw</title>
</head>
<html>
<body>
<center>
<input type="button" value="Circle" onClick="drawCircle()">
<input type="button" value="Filled circle" onClick="fillCircle()">
<input type="button" value="Line" onClick="drawLine()">
<input type="button" value="Text" onClick="drawText()">
<canvas id="canvas">
</canvas>
</center>
<script type="text/javascript" language="javascript" src="draw.js">
</script>
```

```
</body>
</html>
</html>
```

6) Then, type **notepad draw.js** in the command line. Type the following script and save.

```
var can = document.getElementById("canvas");
var ctx = can.getContext("2d");

var w = window.innerWidth, h = window.innerHeight;
can.width = w;
can.height = h;

ctx.font = "24pt Calibri";
ctx.textAlign="center";
ctx.fillStyle = "#660000";
ctx.fillText(w+"x"+h,w/2,24);

function drawCircle()
{
var rad = prompt("Enter radius");
ctx.beginPath();
ctx.arc(w/2, h/2, rad, 0,2*Math.PI);
ctx.stroke();
}

function fillCircle()
{
var rad = prompt("Enter radius"),
        c = prompt("Enter fill color");

ctx.beginPath();
ctx.fillStyle = c;
ctx.arc(w/2, h/2, rad, 0,2*Math.PI);
ctx.fill();
}
```

```
function drawLine()
{
var sx = prompt("Enter start x"),
        sy = prompt("Enter start y"),
        ex = prompt("Enter end x"),
        ey = prompt("Enter end y");
ctx.beginPath();
ctx.moveTo(sx, sy);
ctx.lineTo(ex, ey);
ctx.stroke();
}

function drawText()
{
var txt = prompt("Enter text"),
        x = prompt("Enter x"),
        y = prompt("Enter y"),
        c = prompt("Enter color"),
        s = prompt("Enter font size"),
        n = prompt("Enter font name");
ctx.textAlign="center";
ctx.fillStyle = c;
ctx.font = s+"px "+n;
ctx.fillText(txt,x,y);
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/clock.html. Verify that the clock shows the system time.

## (48) To create analog clock using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.

4) Type **notepad clock.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Analog clock</title>
</head>
<html>
<body>
<center>
<canvas id="clk" width="600" height="600">
</canvas>
</center>
<script type="text/javascript" language="javascript"
src="clock.js">
</script>
<script type="text/javascript" language="javascript">
setInterval(clock,1000);
</script>
</body>
</html>
</html>
```

6) Then, type **notepad clock.js** in the command line. Type the following script and save.

```
var can = document.getElementById("clk");
var ctx = can.getContext("2d");
var w = window.innerWidth*0.45, h =
window.innerHeight*0.45;
var rad = (w<h)?w:h;
can.width = can.height = rad*2;
ctx.translate(rad, rad);
rad *= 0.9;
function clock()
{
drawCircle();
```

```
drawBrim();
drawNumbers();
drawTime();
}
function drawCircle()
{
ctx.beginPath();
ctx.arc(0,0,rad,0,2*Math.PI);
ctx.fillStyle="#FFFFAA";
ctx.fill();
}
function drawBrim() {
var gr = ctx.createRadialGradient(0,0,rad*0.95,0,0,rad*1.05);
gr.addColorStop(0,"#FFAAFF");
gr.addColorStop(0.5,"#FFFFFF");
gr.addColorStop(1,"#FFAAFF");
ctx.strokeStyle = gr;
ctx.lineWidth = rad*0.1;
ctx.stroke();
}
function drawNumbers() {
ctx.fillStyle = "#FF0000"
ctx.font = rad*0.2 + "px calibri";
ctx.setBaseline = "middle";
ctx.textAlign = "center";
for(var i=1; i<=12; i++) {
        var ang = i*Math.PI/6;
        ctx.rotate(ang);
        ctx.translate(0,-rad*(i>=3&&i<=9?0.9:0.8));
        ctx.rotate(-ang);
        ctx.fillText(i.toString(), 0, 0);
        ctx.rotate(ang);
        ctx.translate(0,rad*(i>=3&&i<=9?0.9:0.8));
        ctx.rotate(-ang);
        }
ctx.fillStyle="#0000FF";
ctx.font = rad*0.2 + "px Calibri";
```

```
ctx.setBaseline = "middle";
ctx.textAlign = "center";
ctx.fillText("COPA",0,-rad*0.3);
}
function drawTime()
{
var dt = new Date();
var h = dt.getHours()%12, m = dt.getMinutes(), s =
dt.getSeconds();
s *= Math.PI/30;
m = m*Math.PI/30+s/60;
h = h*Math.PI/6+m/12;
drawHand(m, rad*0.6, rad*0.04, "#00FF00");
drawHand(s, rad*0.75, rad*0.02, "#FF0000");
drawHand(h, rad*0.45, rad*0.08, "#0000FF");
ctx.beginPath();
ctx.arc(0,0,rad*0.05,0,2*Math.PI);
ctx.fillStyle = "#000000";
ctx.fill();
}
function drawHand(s, l, w, c)
{
ctx.beginPath();
ctx.lineWidth = w;
ctx.lineCap = "round";
ctx.moveTo(0,0);
ctx.rotate(s);
ctx.lineTo(0,l);
ctx.strokeStyle = c;
ctx.stroke();
ctx.rotate(-s);
}
```

After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/clock.html. Verify that the clock shows the system time.

## (49) To display an image that moves with the mouse pointer using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad img.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Loading an image</title>
</head>
<html>
<body>
<center>
<canvas id="canvas" onMouseMove="drawImg(event)">
</canvas>
</center>
<script type="text/javascript" language="javascript"
src="img.js">
</script>
</body>
</html>
```

6) Then, type **notepad img.js** in the command line. Type the following script and save:

```
var can = document.getElementById("canvas");
var ctx = can.getContext("2d");

var w = window.innerWidth, h = window.innerHeight;
can.width = w;
can.height = h;
ctx.fillStyle = "#FFFFFF";
ctx.fillRect(0,0,w,h);
ctx.font = "24pt Calibri bold";
```

```
ctx.fillText("VN image test: "+w+"x"+h, w/2, 30);

function drawImg(event)
{
var x = event.clientX, y = event.clientY;
var img = new Image();
img.src="rose1.jpg";
ctx.fillStyle = "#FFFFFF";
ctx.fillRect(0,0,w,h);
ctx.drawImage(img, x, y, img.width*0.25, img.height*0.25);
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/img.html.
8) Move the mouse and watch the image moving with the cursor.

## (50) To display an image that moves with the mouse pointer and leaves a trail using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad img1.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Loading an image</title>
</head>
<html>
<body>
<center>
<canvas id="canvas" onMouseMove="drawImg(event)">
</canvas>
</center>
```

```
<script type="text/javascript" language="javascript"
src="img.js">
</script>
</body>
</html>
</html>
```

6) Then, type **notepad img1.js** in the command line. Type the following script and save:

```
var can = document.getElementById("canvas");
var ctx = can.getContext("2d");
var w = window.innerWidth, h = window.innerHeight;
can.width = w;
can.height = h;
ctx.fillStyle = "#FFFFFF";
ctx.fillRect(0,0,w,h);
ctx.font = "24pt Calibri bold";
ctx.fillText("VN image test: "+w+"x"+h, w/2, 30);
function drawImg(event)
{
var x = event.clientX, y = event.clientY;
var img = new Image();
img.src="rose1.jpg";
ctx.drawImage(img, x, y, img.width*0.25, img.height*0.25);
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/img1.html.
8) Move the mouse and watch the image moving with the cursor. The image leaves a trail.

## (51) To calculate age using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad age.html**. Choose YES when notepad seeks confirmation to create a new file.

5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Age Calculation</title>
<script type="text/javascript" language="javascript" src="age.js">
</script>
</head>
<body style = " background-color: #66FFFF; color: red">
<form name="ageForm" action="#" method="post">
<center>
<h1>Age Calculation</h1>
<table>
<tr><td>Enter DOB</td><td>:</td><td><input type="text" name="x"></td></tr>

</table>
<input type="button" value="Get age" onClick="ageFunc()">

<span id = "res"></span>
</center>
</form>
</body>
</html>
```

6) Then, type **notepad age.js** in the command line. Type the following script and save:

```
function ageFunc() {
var x = document.ageForm.x.value;
var dob = new Date(x);
var today = new Date();
var duration = today.getTime() - dob.getTime();
var age = new Date(duration);
var y = age.getFullYear()-1970, m = age.getMonth(), d = age.getDate()-1*;
var str = y+" Year "+m+" Month "+d+" Day ";
```

```
document.getElementById("res").innerHTML = "<h1 style= 'color:red'>"+str+"</h1>";
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/age.html. Enter date of birth and verify that the correct age is displayed.

## (52) To create a calculator using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad calc.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
<head>
<title>Calculator</title>
<script type="text/javascript" language="javascript" src="calc.js">
</script>
</head>

<body style='background-color:#DDFFAA'>
<form name="calcFrm" action="#" method="POST">
<center>
<h1 style='color:red'>Calculator</h1>

<div align="right">
<input style="text-align:right;color:blue;font-size:120%" type="text" name="mem">
</div>
```

```
<input style="font-size:200%;color:red;text-align:right;overflow:auto" type="text" name="exp"> <br />
<input style="font-size:200%;color:green;text-align:right" type="text" name="res">

<table>
<tr style='background-color:blue;text-align:center'>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="7" onClick="exp.value = exp.value+'7'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="8" onClick="exp.value = exp.value+'8'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="9" onClick="exp.value = exp.value+'9'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="+" onClick="exp.value = exp.value+'+'"></td>
</tr>

<tr style='background-color:blue;text-align:center'>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="4" onClick="exp.value = exp.value+'4'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="5" onClick="exp.value = exp.value+'5'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="6" onClick="exp.value = exp.value+'6'"></td>
<td><input style="background-color:blue;font-size:300%;color:white" type="button" value="-" onClick="exp.value = exp.value+'-'"></td>
</tr>

<tr style='background-color:blue;text-align:center'>
```

```
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="1"
onClick="exp.value = exp.value+'1'"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="2"
onClick="exp.value = exp.value+'2'"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="3"
onClick="exp.value = exp.value+'3'"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="*"
onClick="exp.value = exp.value+'*'"></td>
</tr>

<tr style='background-color:blue;text-align:center'>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="."
onClick="exp.value = exp.value+'.'"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="0"
onClick="exp.value = exp.value+'0'"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="="
onClick="evalFunc()"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="/"
onClick="exp.value = exp.value+'/'"></td>
</tr>

<tr style='background-color:blue;text-align:center'>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="A"
onClick="exp.value = exp.value+ansVal()"></td>
<td><input style="background-color:blue;font-
size:300%;color:white" type="button" value="M"
onClick="memPlace()"></td>
```

```
<td><input style="background-color:blue;font-
size:100%;color:white" type="button" value="MR"
onClick="exp.value = exp.value+memVal()"></td>
<td><input style="background-color:blue;font-
size:100%;color:white" type="button" value="DEL"
onClick="exp.value = backSpace()"></td>
</tr>

</table>
</center>
</form>
</body>
</html>
```

6) Then, type **notepad calc.js** in the command line. Type the following script and save:

```
var mem = 0, ans = 0;

function evalFunc()
{
var input = document.calcFrm.exp.value;
ans = eval(input);
document.calcFrm.res.value = ans;
document.calcFrm.exp.value = "";
dispMem();
}

function memPlace() {
mem = Number(document.calcFrm.res.value);
dispMem();
}

function memVal() {
return mem;
}

function memClr() {
mem = 0;
```

```
dispMem();
}

function ansVal()
{
return ans;
}

function dispMem()
{
document.calcFrm.mem.value = "Memory: "+mem;
}

function backSpace()
{
var txt = document.calcFrm.exp.value;
var len = txt.length;
var sub = txt.substring(0, len-1);
return sub;
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/calc.html.
8) Make input and verify whether the calculator displays the right result.

## (53) To create objects using Javascript

**PROCEDURE:**

1) Start XAMPP control panel. Start Apache server.
2) Open command prompt (Press Windows+R, type **cmd** and press Enter).
3) Type cd \xampp\htdocs\<your folder>.
4) Type **notepad student.html**. Choose YES when notepad seeks confirmation to create a new file.
5) Enter the following HTML code in notepad and save the file:

```
<html>
```

```
<head>
<title>OOPS using Javascript - Student</title>
<script type="text/javascript" language="javascript"
src="student.js">
</script>
</head>

<body>
<form name="studentFrm" action="#" method="GET">
<center>
<input type="button" value="Add student"
onClick="addStud()">
<input type="button" value="Display" onClick="dispStud()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

6) Then, type **notepad student.js** in the command line. Type the following script and save:

```
function Student()
{
this.name = "";
this.dob = null;
this.mark = 0;

this.setName = function(n) {
this.name = n;
}

this.setDOB = function(d) {
this.dob = d;
}

this.setMark = function(m) {
this.mark = m;
}
```

```
this.getName = function() {
return this.name;
}

this.getDOB = function() {
return this.dob;
}

this.getMark = function() {
return this.mark;
}

this.getAge = function() {
return new Date(Date.now() - new
Date(this.dob).getTime()).getFullYear()-1970;
}
}

var studArray = [];
var index = 0;

function addStud()
{
var n = prompt("Name"), d = prompt("DOB"), m =
prompt("Mark");
var st = new Student();
st.setName(n);
st.setDOB(d);
st.setMark(m);
studArray[index] = st;
index++;
}
function dispStud() {
var str = "<table border=1>";
for(var i=0; i<index; i++) {
```

```
        str += "<tr style=font-size:300%;color:green><td>"+(i+1)+")</td>";
        str += "<td>Name: "+studArray[i].getName()+"</td>";
        str += "<td>DOB: "+studArray[i].getDOB()+"</td>";
        str += "<td>Mark: "+studArray[i].getMark()+"</td>";
        str += "<td>Age: "+studArray[i].getAge()+"</td>";
        str += "</tr>"
        }
str += "</table>";
document.getElementById("res").innerHTML = str;
}
```

7) After typing the code, open FireFox browser. Enter the URL http://127.0.0.1/<name>/student.html.
8) Click Add student button add new student.
9) Click display button to view the result. Verify whether all values are displayed correctly by the script.

## (54) To check whether given number is a prime number

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Start MySQL server.
4) Open command prompt (Press Windows+R, type **cmd** and press Enter).
5) Type cd \xampp\htdocs\<your folder>.
6) Type **notepad prime.html** in the command line. Type the following script and save:

```
<html>
<head>
<title>Check for prime</title>
<script type="text/javascript" language="javascript">
function checkPrime()
{
var prime = true;
```

```
var x = parseInt(document.primeFrm.x.value);

if(x>3) {
        for(var i=3,n=x/2; i<=n && prime; i++)
                if(x%i == 0) prime = false;
        }
document.getElementById("res").innerHTML = "<h1 style='color:green;text-align:center'>" +(prime?"Prime":"Not a prime")+ "</h1>";
}
</script>
</head>
<body>
<form name="primeFrm">
<center>
<h1 style="text-align:center;color:red">Prime number</h1>
<table>
<tr><td>Enter number</td><td><input type="text" name="x"></td></tr>
</table>
<input type="button" value="Check prime" onClick="checkPrime()">
<span id="res"> </span>
</center>
</form>
</body>
</html>
```

7) Enter the URL http://127.0.0.1/prime.html in the address bar of browser.
8) Enter a number and press check prime button.
9) The result is displayed either as Prime or as Not a prime.

## (55) To find a prime number just above the given non-prime number

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.

3) Start MySQL server.
4) Open command prompt (Press Windows+R, type **cmd** and press Enter).
5) Type cd \xampp\htdocs\<your folder>.
6) Type **notepad nextprime.html** in the command line. Type the following script and save:

```
<html>
<head>
<title>Next prime</title>
<script type="text/javascript" language="javascript">
function nextPrime()
{
var n = parseInt(document.primeFrm.x.value);
while(!checkPrime(n))
        n++;
document.getElementById("res").innerHTML = "<h1 style='color:green;text-align:center'>" +n+ "</h1>";
}

function checkPrime(x)
{
var prime = true;
if(x>3) {
        for(var i=3,n=x/2; i<=n && prime; i++)
                if(x%i == 0) prime = false;
        }
return prime;
}
</script>
</head>
<body>
<form name="primeFrm">
<center>
<h1 style="text-align:center;color:red">Find next prime number</h1>
<table>
```

```
<tr><td>Enter number</td><td><input type="text" name="x"></td></tr>
</table>
<input type="button" value="Next prime" onClick="nextPrime()">
<span id="res"> </span>
</center>
</form>
</body>
</html>
```

7) Enter the URL http://127.0.0.1/nextprime.html in the address bar of browser.
8) Enter a number and press next prime button.
9) If the input number itself is a prime, the same number is displayed. If not, the next prime number is displayed.

## (56) To display a number in words

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Start MySQL server.
4) Open command prompt (Press Windows+R, type **cmd** and press Enter).
5) Type cd \xampp\htdocs\<your folder>.
6) Type **notepad readnum.html** in the command line. Type the following script and save:

```
<html>
<head>
<title>Number in words</title>
<script type="text/javascript" language="javascript">
function numberInWords()
{
var x = parseInt(document.primeFrm.x.value);
var one, ten, hundred, thousand, lakh, crore;
var words = "";
one = x%10;
x = (x-one)/10;
ten = x%10;
x = (x-ten)/10;
```

```
hundred = x%10;
x = (x-hundred)/10;
thousand = x%100;
x = (x-thousand)/100;
lakh = x%100;
crore = (x-lakh)/100;
words += readDigits(crore,
"Crore") + readDigits(lakh,
"Lakh")+readDigits(thousa
nd, "Thousand")+
        readDigits(hundred,
"Hundred")+readDigits(ten
*10+one,"");
document.getElementById(
"res").innerHTML = "<h1
style='color:green;text-
align:center'>" +words+
"</h1>";
}

function readDigits(x, des)
{
if(x == 0)
        return "";
var num = "";
if(x == 1)
        num = " One ";
else if(x == 2)
        num = " Two ";
else if(x == 3)
        num = " Three ";
else if(x == 4)
        num = " Four ";
else if(x == 5)
        num = " Five ";
else if(x == 6)
        num = " Six ";
else if(x == 7)
        num = " Seven ";
else if(x == 8)
        num = " Eight ";
else if(x == 9)
        num = " Nine ";
else if(x == 10)
        num = " Ten ";
else if(x == 11)
        num = " Eleven ";
else if(x == 12)
        num = " Twelve ";
else if(x == 13)
        num = " Thirteen ";
else if(x == 14)
        num = " Fourteen ";
else if(x == 15)
        num = " Fifteen ";
else if(x == 16)
        num = " Sixteen ";
else if(x == 17)
        num = " Seventeen
";
else if(x == 18)
        num = " Eighteen ";
else if(x == 19)
        num = " Nineteen ";
else if(x == 20)
        num = " Twenty ";
else if(x == 30)
        num = " Thirty ";
else if(x == 40)
        num = " Forty ";
else if(x == 50)
        num = " Fifty ";
else if(x == 60)
        num = " Sixty ";
```

```
else if(x == 70)
        num = " Seventy ";
else if(x == 80)
        num = " Eighty ";
else if(x == 90)
        num = " Ninety ";
else if(x<100)
        num = readDigits((x-
x%10)," ")+"
"+readDigits(x%10," ");
return num+" "+des;
}

</script>
</head>
<body>
<form name="primeFrm">
<center>
<h1 style="text-
align:center;color:red">Nu
mber to words</h1>
<table>
<tr><td>Enter
number</td><td><input
type="text"
name="x"></td></tr>
</table>
<input type="button"
value="In words"
onClick="numberInWords()
">
<span id="res"> </span>
</center>
</form>
</body>
</html>
```

7) Enter the URL http://127.0.0.1/readnum.html in the address bar of browser.
8) Enter a number and press next prime button.
9) Verify that the given number is correctly displayed in words.

---

## (57) To calculate sum of digits of given number

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Open command prompt (Press Windows+R, type cmd and press Enter).
4) Type cd \xampp\htdocs\<your folder>.
5) Type notepad sumofdigits.html in the command line. Type the following script and save:

```
<html>
<head>
<title>Sum of digits</title>
<script type="text/javascript" language="javascript">
function sum()
{
var sum = 0;
var tmp=0;
var x = document.getElementById("x").value;

while(x>0) {
        tmp = x%10;
        sum += tmp;
        x = (x-tmp)/10;
        if(x == 0 && sum > 9) {
                x = sum;
                sum = 0;
                }
        }
document.getElementById("res").innerHTML = "<h1
style='color:green'>" + sum + "</h1>";
```

```
}
</script>
</head>
<body style='content-align:center;background-
color:#AACCAA;font-weight:bold'>
<h1 style='color:red;text-align:center'>Sum of digits</h1>
<center>
<table>
<tr><td>Enter a number</td><td>:</td>
<td><input type="number" id="x"></td></tr>
</table>
<input type="button" value="Sum of digits" onClick="sum()">
<span id="res"></span>
</center>
</body>
</html>
```

6) Enter the URL http://127.0.0.1/sumofdigits.html in the address bar of browser.
7) Enter a number.
8) Verify that the result is correct.

## (58) To convert temperature from Celsius to Fahrenheit

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Open command prompt. Type **cd \xampp\htdocs\<your name>**.
4) Type **notepad c2f.html** in the command prompt and type the following script and save the file:

```
<html>
<head>
<title>Temperature conversion: Celsius to Fahrenheit </title>
<script type="text/javascript" language="javascript">
function c2f()
```

```
{
var c = Number(f2cFrm.x.value);
var f = 9/5*c+32;
var str = "<h1 style='color:green'>"+c+"<sup>o</sup>C = "+
        f+"<sup>o</sup>F</h1>";
document.getElementById("res").innerHTML=str;
}
</script>
</head>

<body style='background:#AACCFF;color:red;text-
align:center'>
<h1>Convert temperature from  Celsius to Fahrenheit</h1>
<form name="f2cFrm" action="#" method="POST">
<center>
<table>
<tr><td>Enter temperature in Celsisus</td><td><input
type="text" name="x"></td></tr>
</table>
<input type="button" value="Convert" onClick="c2f()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

5) Type http://127.0.0.1/<yourname>/c2f.html in the address bar of browser. Enter sample Fahrenheit values (0, -40, 40) and verify whether the resulting Celsius values are correctly displayed (32, -40, 86).

## (59) To convert temperature from Fahrenheit to Celsius

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.

3) Open command prompt. Type **cd \xampp\htdocs\<your name>**.
4) Type **notepad f2c.html** in the command prompt and type the following script and save the file:

```
<html>
<head>
<title>Temperature conversion: Fahrenheit to Celsius</title>
<script type="text/javascript" language="javascript">
function f2c()
{
var f = Number(f2cFrm.x.value);
var c = (f-32)*5/9;
var str = "<h1 style='color:green'>"+f+"<sup>o</sup>F = "+
        c+"<sup>o</sup>C</h1>";
document.getElementById("res").innerHTML=str;
}
</script>
</head>

<body style='background:#AACCFF;color:red;text-
align:center'>
<h1>Convert temperature from Fahrenheit to Celsius</h1>
<form name="f2cFrm" action="#" method="POST">
<center>
<table>
<tr><td>Enter temperature in Fahrenheit</td><td><input
type="text" name="x"></td></tr>
</table>
<input type="button" value="Convert" onClick="f2c()">
<span id="res"></span>
</center>
</form>
</body>
</html>
```

5) Type http://127.0.0.1/<yourname>/f2c.html in the address bar of browser. Enter sample Fahrenheit values

(32, -40, 42) and verify whether the resulting Celsius values are correctly displayed (0, -40, 18).

## (60) To convert temperature from Celsius to Fahrenheit and vice-versa

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Open command prompt. Type **cd \xampp\htdocs\<your name>**.
4) Type **notepad temp.html** in the command prompt and type the following script and save the file:

```
<html>
<head>
<title>Temperature conversion</title>
<script type="text/javascript" language="javascript">
function convert()
{
var opt = tempFrm.opt.value;
var str = "";
if(opt == "f2c") {
        var f = Number(tempFrm.x.value);
        var c = (f-32)*5/9;
        str = "<h1 style='color:green'>"+f+"<sup>o</sup>F = "+
                c+"<sup>o</sup>C</h1>";
        }
else {
        var c = Number(tempFrm.x.value);
        var f = 9/5*c+32;
        str = "<h1 style='color:green'>"+c+"<sup>o</sup>C =
"+
        f+"<sup>o</sup>F</h1>";
        }
document.getElementById("res").innerHTML=str;
}
```

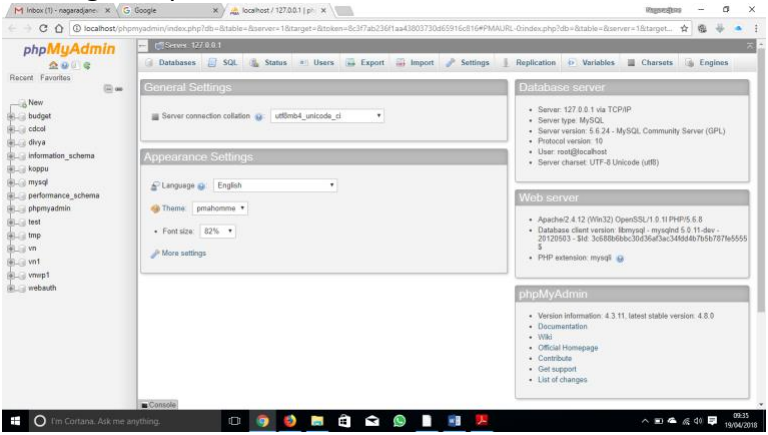
```
</script>
</head>

<body style='background:#AACCFF;color:red;text-
align:center'>
<h1>Convert temperature from Fahrenheit to Celsius</h1>
<form name="tempFrm" action="#" method="POST">
<center>
<table>
<tr><td>Enter temperature in Fahrenheit</td><td><input
type="text" name="x"></td></tr>
<tr><td>Choose conversion</td>
<td>
<select name="opt">
<option value="f2c">Fahrenheit to Celsius</option>
<option value="c2f">Celsius to Fahrenheit</option>
</select>
</td></tr>
</table>

<input type="button" value="Convert" onClick="convert()">

<span id="res"></span>
</center>
</form>

</body>
</html>
```

5) Type http://127.0.0.1/<yourname>/temp.html in the address bar of browser. Enter sample Fahrenheit values (0, -40, 40) and verify whether the resulting Celsius values are correctly displayed (32, -40, 86) and try the results vice-versa.

## (61) To create website using WordPress CMS (Content Management System)

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Start MySQL server.
4) Press **Admin** button of MySQL. The webpage shown in figure opens:




5) If you wish to create a new database for CMS (Content Management System), create new database (say <name>cms), by clicking the New link in the left side panel.
6) Click on the newly created database.
7) Choose **Privileges** tab. Press New user link to create new user.
8) Enter user name (<name>cms). Choose **localhost** for login. Enter and reenter password. Memorize the user name and password (or keep it safely written).
9) Extract the zip file containing WordPress. Copy the contents to your web directory (c:\xampp\htdocs\<yourname>).
10) Navigate the the folder c:\xampp\htdocs\<yourname>\wordpress\. Open the wp-config-sample.php. Enter the database name, user name and password in the appropriate fields. Choose

File->Save As, enter the name wp-config.php, set file type to All files and press Save button.

11) Open the URL http://127.0.0.1/<yourname>/wordpress/wp-admin/install.php.
12) Welcome screen appears. Enter user name, password and email ID. On clicking Submit button, the new configuration is applied.
13) Login screen appears. Enter your wordpress user name and password to login (http://127.0.0.1/<name>/wordpress/wp-login.php).
14) You may customize the website by pressing the pencil icon to edit images and text.
15) After completing the editing process, press Publish button to get the changes published.
16) Type the URL http://127.0.0.1/<yourname>/wordpress/index.php to view the website created by you.

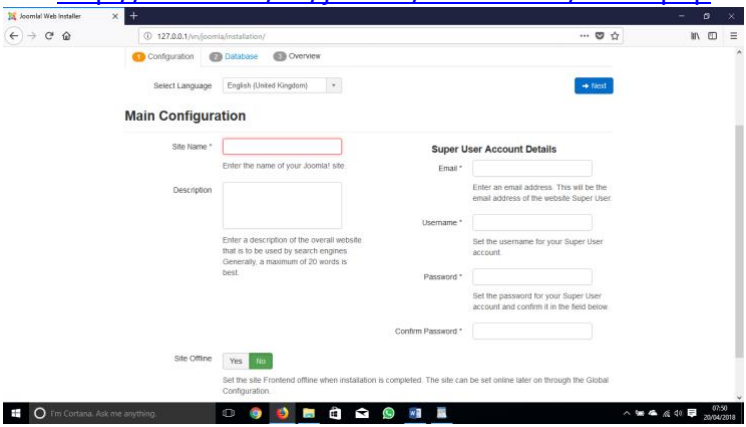
## (62) To create website using Joomla CMS (Content Management System)

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Start MySQL server.
4) Press **Admin** button of MySQL. The webpage shown in figure opens:
5) If you wish to create a new database for CMS (Content Management System), create new database (say <name>cms), by clicking the New link in the left side panel.
6) Click on the newly created database.
7) Choose **Privileges** tab. Press New user link to create new user.
8) Enter user name (<name>cms). Choose **localhost** for login. Enter and reenter password. Memorize the user name and password (or keep it safely written).

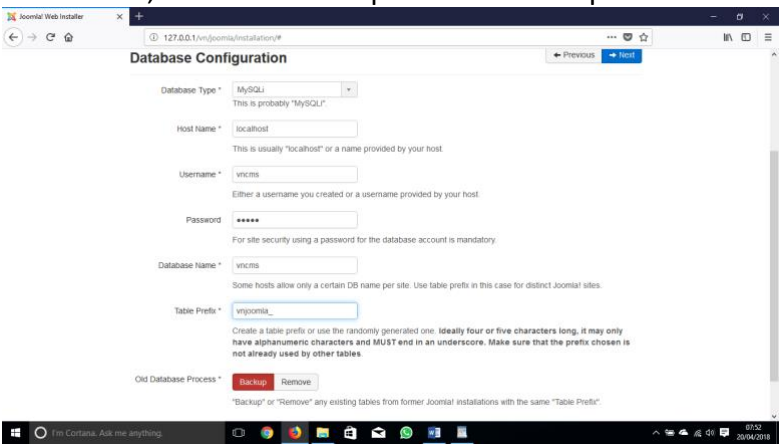
9) Extract the zip file containing Joomla. Copy the contents to your web directory (c:\xampp\htdocs\<yourname>).

10) Open the URL http://127.0.0.1/vn/joomla/installation/index.php.




11) Configuration screen appears. Enter name of website, description, email ID, user name, password.

12) On clicking Next button, the details of MySQL database name, user name and password are requested.




13) Fill the details and press Next button.

14) Choose the type of website (say Default English (GB)). Press Install button and wait till the installation is completed.

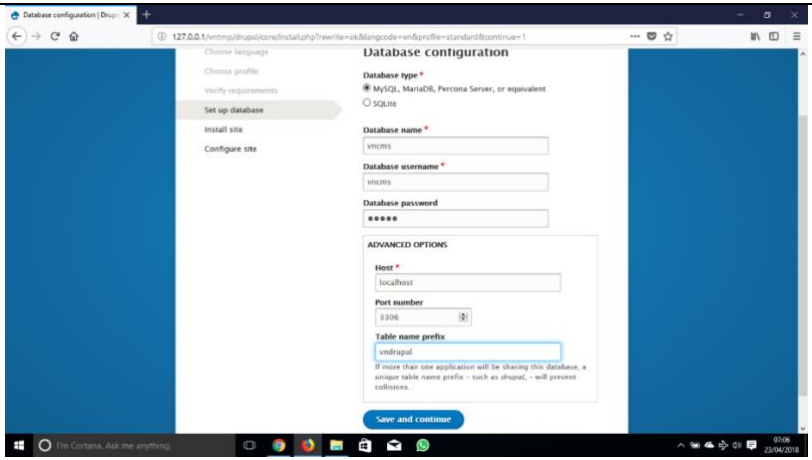
15) The message showing successful installation appears. Press Remove installation folder button.

16) Click Site button. When the site loads, login using user ID and password.
17) All links become editable as the mouse pointer moves over them.
18) Edit the contents to suit your taste.
19) Type the URL http://127.0.0.1/name/joomla/ to view the website created by you.

## (63) To create website using Drupal CMS (Content Management System)

**PROCEDURE:**

1) Start XAMPP control panel.
2) Start Apache server.
3) Start MySQL server.
4) Press **Admin** button of MySQL. The webpage shown in figure opens:
5) If you wish to create a new database for CMS (Content Management System), create new database (say <name>cms), by clicking the New link in the left side panel.
6) Click on the newly created database.
7) Choose **Privileges** tab. Press New user link to create new user.
8) Enter user name (<name>cms). Choose **localhost** for login. Enter and reenter password. Memorize the user name and password (or keep it safely written).
9) Extract the zip file containing Joomla. Copy the contents to your web directory (c:\xampp\htdocs\<yourname>).
10) Open the URL http://127.0.0.1/<name>/Drupal/index.php.
11) Configuration screen appears. Choose English language, press Save and continue.
12) Database configuration screen appears. Press Advanced settings. Enter database name, user name, password. Enter <name>drupal_ against the table prefix.




13) Choose India for country, Kolkata for time zone.
14) Allow Drupal to complete installation of the website.
15) Website configuration screen appears. Create a default page for your website from available choices of page design.
16) Create new page save and close the details and preview the page for possible corrections.

## (64) To create worksheets for data entry using VBA

**PROCEDURE**

1) Open MS Excel (press Windows+R, type “Excel” and press Enter).
2) Choose Blank Workbook.
3) Rename Sheet1 to *Income.*
4) Create Sheet2. Rename Sheet2 to *Expense*.
5) Enter the following values in first row of Income sheet:

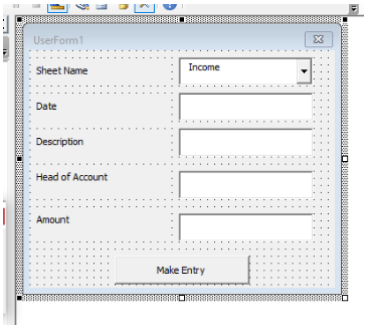
| Date | Description | Head of Account | Amount |
|---|---|---|---|

6) Apply bold font style, centre/ middle alignment and wrap text styles. Apply all borders to range A1 to D1.
7) Create columns A1 to D1 as given in steps 5 and 6.
8) Save the workbook with the name <copa>-data-entry.xlsm.
9) In the save Dialog, choose “Excel Macro Enabled Workbook (*.xlsm)” as the file type.

## (65) To create a VBA form for data entry in MS Excel

**PROCEDURE**

1) Open MS Excel (press Windows+R, type “Excel” and press Enter).
2) Choose <copa>-data-entry.xlsm Workbook.
3) Press Alt+F11 or go to Developer Tab, choose VBA.
4) If Developer Tab is not visible, choose File->Options->Customize Ribbon->Main Tabs and place a tick mark against *Developer*.
5) The Integrated Development Environment (IDE) for VBA opens.
6) Choose Insert->User Form from VBA IDE menu.
7) A form appears along with Toolbox.
8) Use Label tool and create the following labels vertically: Sheet Name, Date, Description, Head of Account, Amount.
9) Insert ComboBox tool (with name ComboBox1) against Sheet Name.
10) While keeping ComboBox1 in focus, open properties (F4 or View->Properties Window) and set Value to Income.
11) Insert TextBoxes against Date, Description, Head of Account and Amount Labels (TextBox1, TextBox2, TextBox3 and TextBox4).




12) Insert CommandButton1 and change it Caption property to *Make Entry.*
13) The form should look like the one shown here.
14) Enter the following code in Code Window (F7 or View->Code Window):

***Private Sub CommandButton1_Click()***

```
Worksheets(ComboBox1.Value).Activate
Dim row, col
row = ActiveSheet.UsedRange.Rows.Count + 1
col = ActiveSheet.UsedRange.Columns.Count

For i = 1 To 4 Step 1
   Range(Cells(row, i), Cells(row, 1)).BorderAround
(XlLineStyle.xlContinuous)
Next i


Cells(row, 1) = TextBox1.Text
Cells(row, 2) = TextBox2.Text
Cells(row, 3) = TextBox3.Text
Cells(row, 4) = TextBox4.Text

TextBox1.Text = ""
TextBox2.Text = ""
TextBox3.Text = ""
TextBox4.Text = ""

End Sub

Private Sub UserForm_Activate()
With ComboBox1
.AddItem ("Income")
.AddItem ("Expense")
End With
End Sub
```

15) The form is now ready for inserting records in the Sheets Income or Expense.
16) After typing the code, Run the code or the UserForm (F5 or Run->Run Sub/User Form).
17) Choose Income against Sheet Name and enter the following data:

| Date | Description | Head of Account | Amount |
|---|---|---|---|
| 27-03-2023 | Salary from vision tech | Salary | 1200 |
| 27-03-2023 | Pocket money | Home | 80 |
| 02-04-2023 | Expected salary | Salary | 1200 |

18) Choose Expense against Sheet Name and Enter the following records through the form:

| Date | Description | Head of Account | Amount |
|---|---|---|---|
| 26-03-2023 | Bus fare | Travel | 25 |
| 26-03-2023 | Fancy items | Personal | 34 |

19) Take a screenshot of the form, print the source code and print both Income and expense sheets.

## (66) Creating macro launcher using Developer Tab in Excel

**PROCEDURE**

1) Open MS Excel (press Windows+R, type “Excel” and press Enter).
2) Choose <copa>-data-entry.xlsm Workbook.
3) Press Alt+F11 or go to Developer Tab, choose VBA.
4) If Developer Tab is not visible, choose File->Options->Customize Ribbon->Main Tabs and place a tick mark against *Developer*.
5) In VBA IDE, choose Insert->Module. A code window appears. Type the following code:

```
Sub AccountForm()
Load UserForm1
UserForm1.Show
End Sub
```

6) Save the code and close VBA IDE. Now, AccountForm is ready for invocation through Button or other controls.
7) Choose Developer->Insert->Form Controls->Command Button.
8) Draw a button on the spreadsheet.
9) A dialog appears to assign macro to CommandButton1. Choose AccountForm against macro. Press Ok.
10) Right click upon the button and choose Rename. Edit the text and change it to ***Make Entry***.
11) On Clicking the button, the data entry form should open. Take a screenshot showing the command button and data entry form.
12) Enter at least 3 more rows of data to each worksheet (Income and Expense).

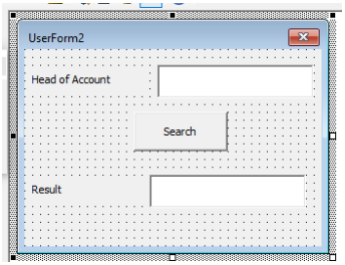
## (67) Lookup function in VBA

**PROCEDURE**

1) Open MS Excel (press Windows+R, type "Excel" and press Enter).
2) Choose <copa>-data-entry.xlsm Workbook.
3) Press Alt+F11 or go to Developer Tab, choose VBA.
4) If Developer Tab is not visible, choose File->Options->Customize Ribbon->Main Tabs and place a tick mark against *Developer*.
5) Create a form using labels, textboxes and commandbutton as shown here.
6) Enter the following code in code window:

```
Private Sub CommandButton1_Click()
Dim row, res
row = ActiveSheet.UsedRange.Rows.Count
res = WorksheetFunction.Lookup(TextBox1.Text, _
   Range(Cells(1, 3), Cells(row, 3)), _
   Range(Cells(1, 4), Cells(row, 4)))
```

***TextBox2.Text = res***
***End Sub***

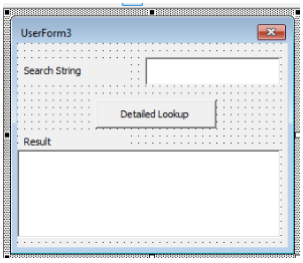



7) On Entering a search string (pertaining to column 3 – head of account), the form should display result from column 4 (amount). Note that lookup works only when the search column is sorted.

## (68) Creating customized lookup function using VBA

**PROCEDURE**

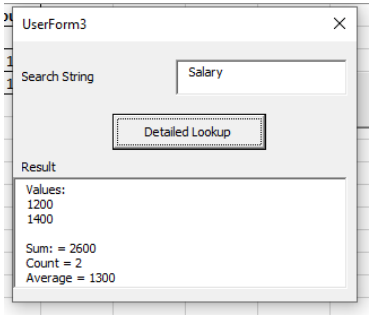
1) Open MS Excel (press Windows+R, type "Excel" and press Enter).
2) Choose <copa>-data-entry.xlsm Workbook.
3) Press Alt+F11 or go to Developer Tab, choose VBA.
4) If Developer Tab is not visible, choose File->Options->Customize Ribbon->Main Tabs and place a tick mark against *Developer*.




5) Create a form using labels, textboxes and commandbutton as shown here.
6) For TextBox2, set the property MultiLine to True and 3 – frmScrollBarsBoth against Scrollbars.
7) Enter the following code in code window:

***Private Sub CommandButton1_Click()***
***Dim txt, res, sum, cnt, average***
***txt = TextBox1.Text***
***res = getValues(txt)***
***sum = getSum(txt)***
***cnt = getCount(txt)***
***average = sum / cnt***

```
TextBox2.Text = _
   "Values: " & vbCrLf & res & vbCrLf & _
   "Sum: = " & sum & vbCrLf & _
   "Count = " & cnt & vbCrLf & _
   "Average = " & average
End Sub

Function getValues(t)
getValues = ""
For i = 2 To ActiveSheet.UsedRange.Rows.Count
If (Cells(i, 3) = t) Then
   getValues = getValues & Cells(i, 4) & vbCrLf
End If
Next i
End Function

Function getSum(t)
getSum = 0
For i = 2 To ActiveSheet.UsedRange.Rows.Count
If (Cells(i, 3) = t) Then
   getSum = getSum + CDbl(Cells(i, 4))
End If
Next i
End Function

Function getCount(t)
getCount = 0
For i = 2 To ActiveSheet.UsedRange.Rows.Count
If (Cells(i, 3) = t) Then
   getCount = getCount + 1
End If
Next i
End Function
```




8) Run the above code. A detailed search report

similar to the one shown in figure should be obtained.

9) Print screenshot of the UserForm result and print the source code.

## (69) Advanced charting with filters and macros using VBA

**PROCEDURE**

1) Open MS Excel (press Windows+R, type "Excel" and press Enter).
2) Choose new Workbook.
3) Copy and paste the historical BSE Sensex closing values for 2022 from given text file to cells A1:B249 of Excel spreadsheet.
4) Enter Date and BSE in cells D1 and E1.
5) Enter the following formula in cell D2:

**=FILTER(A2:B249,MONTH(A2:A249)=F1)**

6) Open VBA IDE (Alt+F11).
7) Choose Insert->Module. Enter the code similar to the following for 12 months of the year:

```
Sub Jan()
Range("F1").Value = "1"
Range("E1").Value = "BSE Closing - January 2022"
End Sub

Sub Feb()
Range("F1").Value = "2"
Range("E1").Value = "BSE Closing - February 2022"
End Sub

Sub Mar()
Range("F1").Value = "3"
Range("E1").Value = "BSE Closing - March 2022"
End Sub
```

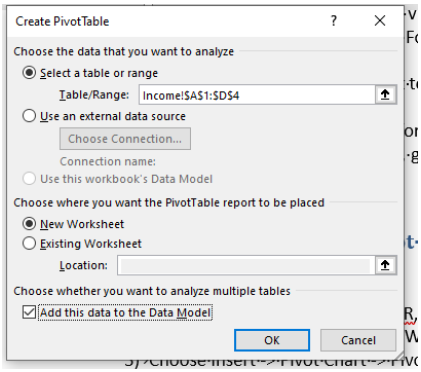
```
Sub Apr()
Range("F1").Value = "4"
Range("E1").Value = "BSE Closing - April 2022"
End Sub
```

8) Save the VBA code and close the VBA IDE.
9) Choose Developer Tab. Insert -> Form Controls -> Button. Choose Assign Macro and Jan for the button.
10) Insert another button. Edit text to make it Feb. Assign macro Feb to the button.
11) Repeat the same process for other months of year.
12) When a button is pressed, graph pertaining to particular month is displayed.

## (70) Analysing data using Pivot chart

**PROCEDURE**

1) Open MS Excel (press Windows+R, type "Excel" and press Enter).
2) Choose <copa>-data-entry.xlsm Workbook.
3) Choose Insert -> Pivot Chart -> Pivot Chart and Pivot Table.
4) Place a tick mark against ***Add this data to the data model*** box.
5) Press Ok.
6) Choose Head of Account and Amount or Date and Amount in the column option.
7) Take screenshot of the Pivot chart and Pivot table.




## (71) Installing Power BI Desktop

**PROCEDURE**

1) Right Click upon Power BI installer. Choose Run As Administrator.
2) Choose Yes when Windows seeks confirmation.
3) Choose Next when Power BI Installer opens. Click Finish when installation is completed.
4) Take a screenshot of Power BI Opening Window.

## (72) Simple Power BI Visualization of Data

**PROCEDURE**

1) Open Power BI.
2) Copy the file BSE.csv to Documents folder.
3) Choose Home -> Get Data -> CSV Data source. Choose BSE.csv file.
4) Wait till importing is completed.
5) Choose line chart. Place tick marks against BSE and date columns in data tab which appears at the right extreme.
6) Choose column chart. Place tick marks against BSE and date columns in data tab which appears at the right extreme.
7) Choose Slicer. Place one tick mark against BSE. Expand date value by pressing the > symbol. Choose month.
8) Now, placing tick mark against any given month draws the graph for that particular month.
9) Save the PowerBI dashboard with the name <copa>-bse-data.pbix
10) Choose File->Export->Export to PDF or press Ctrl+P.
11) The data is shown in the system PDF viewer. Choose Save As (in case of Adobe PDF) or press Ctrl+P and print the same to PDF or on paper.

## (73) Working with Power Query editor in Power BI

**PROCEDURE**

1) Open Power BI.
2) Copy the file sales-order.xlsx to Downloads folder.

3) Choose Home->Get Data->Excel Workbook. Choose sales-order.xlsx file.
4) The Navigator opens the data. Choose Sales Order table by placing a tick mark.
5) At the bottom of Navigator, Transform Data appears (You may choose Save and then choose Home->Transform Data as an alternative).
6) Choose the column named Customer Name Index. Choose Home->Delete Column in Power Query Editor.
7) Choose the column named Sales Region Index. Choose Home->Delete Column in Power Query Editor.
8) Choose the column named Product Description Index. Choose Home->Delete Column in Power Query Editor.
9) Choose Home->Apply and Quit to save the data and close power query editor.
10) Create a Pie chart for Channel and Total Revenue.
11) Create line chart for Order Data and Total Revenue.
12) Choose Clustered Column Chart. Choose Currency Code and Total Revenue.
13) Choose Slicer. Choose Channel.
14) Choose Slicer. Choose Currency code.
15) Choose Slicer. Choose Quarter from order date.

## (74) Creating Excel Dashboard for Sales Data

**PROCEDURE**

1) Open sales-order.xlsx in MS Excel.
2) Insert Pivot chart for sales data. Change Chart type to Column. Choose Currency Code against axis and Total Revenue against value.
3) Insert Pivot chart for sales data. Change chart type to line. Choose Order Date against axis, Total Revenue against value and Quarter against filter.
4) Insert Pivot chart for sales data. Choose chart type to donut. Choose Order Date against axis, Total Revenue against value and Quarter against filter.

5) Create a blank sheet. Go to Page Layout menu. Remove tick marks against gridlines and headings.
6) Insert a text field. Enter Sales Dashboard in the text field.
7) Copy and paste all the pivot charts. Customize the colours and backgrounds. Take a print.

## (75) Installing Python

**PROCEDURE**

1) Python interpreter is free software available for download from the URL https://www.python.org/.
2) Right click on Python installer. Choose Run as Administrator.
3) Press Install for installation of Python. Wait till the installation is completed.
4) Open Start menu. Go to Python. Right click on Python.
5) Choose More->Open file location.
6) Right click on IDLE (the built-in Python IDE). Choose Send to->Desktop (create shortcut).
7) Right click on Python (the built-in Python IDE). Choose Send to->Desktop (create shortcut).
8) Launch IDLE. Choose Help->Turtle tutorial. Run any example program (clock) and take a screenshot.
9) Install Spyder IDE for Python.

## (76) To create welcome script in Python

**PROCEDURE**

1) Open IDLE (the IDE for Python).
2) An interactive shell opens. Type the following command in the IDLE prompt:

**Print("Hello COPA! Welcome to Python!!")**

3) The python shell will display the result **Hello COPA! Welcome to Python!!**.
4) Take a screenshot of the result.

## (77) Addition of numbers using Python (IDLE version)

**PROCEDURE**

1) Open IDLE (the IDE for Python).
2) An interactive shell opens. Type the following command in the IDLE prompt:

**x=input("Enter x: ")**

3) On pressing Enter key, Python prompts for the entry of an input. Type any number (say 45).

**y=input("Enter y: ")**

4) On pressing Enter key, Python prompts for the entry of another input. Type any number (say 27).
5) Enter the following lines of command in the interactive shell:

**z = int(x) + int(y)**
**print(z)**

6) The above lines convert x and y to integer data type, add the numbers and assign the result to z (simply typing z = x+y would consider both x and y as strings and return 4527 as the result).
7) The statement print(z) displays the result (which is 72 in the present case).
8) Take a screenshot of the IDLE window and print the same.

## (78) Multiplication of numbers using Python (Spyder IDE version)

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in code window:

**x = input("Enter x: ")**
**y = input("Enter y: ")**
**z = float(x) * float(y)**
**print(x,"*",y,"=",z)**

3) Save the source code in a directory (c:\users\copa\Documents\python) with the name mult.py.

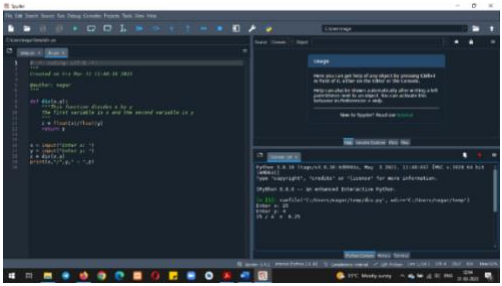
4) Press F5 from keyboard or choose Run->Run from the menu.
5) The console seeks two inputs for x and y. The result is displayed after entering the variables.
6) Take a screenshot and print the same.

## (79) Division of numbers using function in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
def div(x,y):
    """This function divides x by y
    The first variable is x and the second variable is y
    """
    z = float(x)/float(y)
    return z

x = input("Enter x: ")
y = input("Enter y: ")
z = div(x,y)
print(x,"/",y," = ",z)
```



3) Save the source code in a file named div.py.
4) To run the program, press F5 or choose Run->Run or press the triangle icon in the toolbar.
5) Enter numbers when prompted by the IDE (say 25 for x and 4 for y).
6) The console displays the result.
7) The above code defines a new function named div using def keyword. The argument values are enclosed in brackets. A colon (:) is placed at the end of function definition line to start a new block of code.

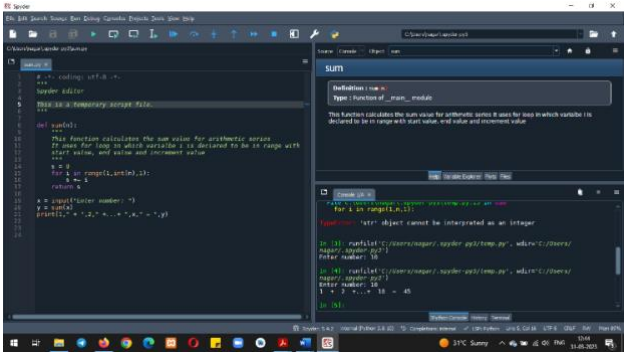
8) The source code inside the function should be indented by (at least) one tab space to denote the function code block.
9) Take a screenshot and print the same.

## (80) Making Documentation comments and viewing comments in Python (sum of series)

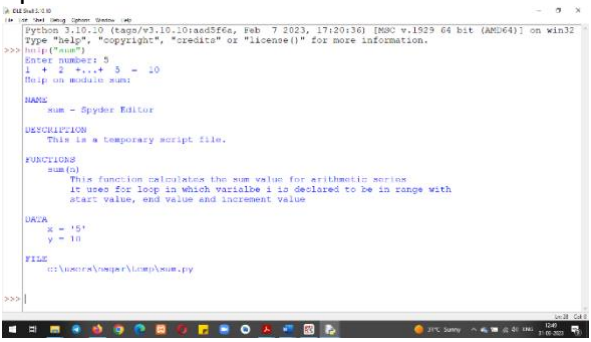
**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
def sum(n):
    """
    This function calculates the sum value for arithmetic series
    It uses for loop in which varialbe i is declared to be in range with
    start value, end value and increment value
    """
    s = 0
    for i in range(1,int(n),1):
        s += i
    return s

x = input("Enter number: ")
y = sum(x)
print(1," + ",2," +...+ ",x," = ",y)
```



3) Take a look at the second line in which “”” (triple double quotes) open documentation comments for the function named sum. The same symbol (“”””) placed on the sixth line ends the documentation comment.
4) Documentation comments are displayed when the word **sum** is typed in the help search box of Spyder IDE.
5) Comments may also be displayed by issuing the command help(“sum”) is typed in IDLE or Python shell after loading div.py script.
6) Take a screenshot and print the Spyder window.
7) Open the script using IDLE, type help(“sum”) and press enter. Take screenshot of the IDLE window displaying help.




## (81) Python program to demonstrate operator precedence

**PROCEDURE**

1) Open IDLE IDE.
2) Type the following code in IDLE IDE:

**x=12+3*2-1/5**
**print(x)**

3) The above code would display 17.8 as the result.
4) This is because the above line is executed in the following sequence due to operator precedence:
    a. 1/5 (0.5)
    b. 3*2 (6)
    c. 6-0.5 (5.8)
    d. 12+5.8 (17.8)

5) Among the values occupying the same line of source code, precedence is in the order of power, division, multiplication, subtraction and addition.

## (82) Use of if condition in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
def fact(n):
  if(n<=1):
    return 1
  return n * fact(n-1)

n = int(input("Enter a number: "))
f = fact(n)
print(n,"! = ",f)
```

3) Line 2 shows the use of if condition. The block of code belonging to if condition should begin with a colon (:) and maintain the indent level.
4) The above program calculates factorial of given number using recursion (the function makes a call to itself).
5) Take a screenshot and print the same.

## (83) Marks and grades using if-else in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
x = int(input("Enter percentage mark: "))
gr = ""
if(x>=80):
  gr = "O"
elif(x>=75):
  gr = "A"
elif(x>=70):
```

```
    gr = "B"
elif(x>=60):
    gr = "C"
elif(x>=50):
    gr = "D"
elif(x>=35):
    gr = "P"
else:
    gr = "F"
print(gr)
```

3) Run the program and offer input in the range of 0 to 100.
4) The program should display proper grade for given mark.

## (84) Sum of squares of a series using while loop in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import math

def sumsq(n):
    i=1; ss=0
    while(i<=n):
        ss += math.pow(i,2)
        i+=1
    return ss

x = int(input("Enter number: "))
res = sumsq(x)
print(res)
```

3) Run the script. Provide a number (say 10) as the input.
4) Verify that the result represents sum of squares (say 385).

## (85) Working with lists in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
x = [1,3,"one","three","five"]
print(x)
x.append("seven")
print("x: ",x)
y = x.copy()
print("y: ",y)
y.extend(["nine","eleven"])
print("Extended y: ",y)
print("Count of five: ",y.count("five"))
print("index of three: ",y.index("three"))
y.insert(2,5)
y.insert(3,7)
y.insert(4,9)
y.insert(5,11)
print("y: ",y)
y.pop()
print("After Pop",y)
y.remove(11)
print("y after remove",y)
y.reverse()
print("Reverse: ",y)
x.remove(1)
x.remove(3)
x.sort()
print("x after sorting",x)
"""This is list comprehension"""
z = [k for k in x if "i" in k]
print("x after comprehension for i: ",z)
```

3) Save the script with the name <copa>list.py.
4) Run the script and watch the list functions and producing results.

## (86) Working with tuples in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
x = ("one","two","three","four","one")
print(x)
print("count of one: ",x.count("one"))
print(x.index("four"))
```

3) Save the script with the name <copa>tuple.py.
4) Run the script and watch the tuple functions and producing results.
5) Just 2 functions are supported by tuples, viz., count and index.

## (87) Working with sets in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
x = {"one","three","five","seven"}
y={"three","five","eleven"}
print(x)
x.add("seven")
print("x: ",x)
print("y: ",y)

z = x.copy()
z = z.difference(y)
print("Difference between: ",x," and ", y," is ",z)

z = x.copy()
z.difference_update(y)
print("After difference update",z)

z = x.copy()
z.discard("one")
```

```
print("After discarding one ",z)

z = x.copy()
z = z.intersection(y)
print("x intersection y ",z)

z = x.copy()
z.intersection_update(y)
print("Interesection update ",z)

print("Whether x and y are disjoints: ",x.isdisjoint(y))
print("Whether x is subset of y: ",x.issubset(y))
print("Whether y is subset of x: ",y.issubset(x))
print("Whether x is superset of y: ",x.issuperset(y))
print("Whether y is superset of x: ",y.issuperset(x))

z = x.copy()
print(z," set after pop: ",z.pop())
print(z," set after pop: ",z.pop())

z = x.copy()
print("Symmetric difference: ",x.symmetric_difference(y))
z = x.symmetric_difference_update(y)
print("Symmetric difference update: ",z)

z = x.union(y)
print("x union y is: ",z)
x.update(y)
print("x after update: ",x)
```

3) Save the script with the name <copa>set.py.
4) Run the program to see the set functions and their results.

## (88) Working with Dictionaries in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.

2) Type the following code in Spyder IDE:

```
x = {
   "1":"one",
   "2":"two",
   "3":"three",
   "4":"four"
   }
print("x: ",x)
y = x.copy()
print("y: ",y)
print("3 from keys: ",x.fromkeys("3"))

print("Value for key 4: ",x.get("4"))
print("items: ",x.items())
print("keys: ",x.keys())
print("values: ",x.values())
print("pop: ",y.pop("1"))
print("After pop: ",y)
y = x.setdefault("4")
print("x printed with default: ",y)
x.update({"1":"zero"})
print("x updated with wrong value: ",x)
x.update({"1":"one"})
x.update({"0":"zero"})
print("x updated: ",x)
```

3) Save the script with the name <copa>dict.py.
4) Run the script to watch the functions and their results.

## (89) Formatting results in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
x=float(input("Enter a decimal number: "))
print("Float formatted with %%f: %f %.3f %6.2f" % (x,x,x))
print("x printed as integer: %8d %5d %d" % (x,x,x))
print("Exponential format: %6.3e %.2e %e" % (x,x,x))
```

3) Save the script with the name *<copa>fmt.py*.
4) Run the script. Provide an input and see the formatted results.

## (90) Working with dates in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import datetime

x = datetime.datetime.now()
print(x)

x = datetime.datetime(2023,4,20)
print("%4d-%d-%d" % (x.year,x.month,x.day))

x = datetime.datetime.now()
print(x.strftime("%Y-%m-%d"))
```

3) Save the script with the name *<copa>dt.py*.
4) Run the script. See the current date and time.
5) Result is shown for 20-Apr-2023 with the usual formatting notations.

## (91) Creating a GUI to display welcome message using Python

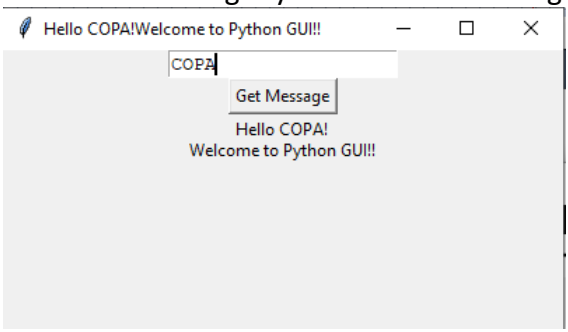
**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import tkinter as tk
frame = tk.Tk()
frame.title("Welcome to Python")
frame.geometry("400x200")

def printMess():
  inp = txt.get(1.0,"end-1c")
```

```
    lbl.config(text="Hello "+inp+"!\nWelcome to Python GUI!!")
    frame.title("Hello "+inp+"!\nWelcome to Python GUI!!")

txt = tk.Text(frame,height=1, width=20)
txt.pack()

button = tk.Button(frame, text="Get Message",
command=printMess)
button.pack()

lbl = tk.Label(frame,text="")
lbl.pack()

frame.mainloop()
```

3) Save the script with the name *<copa>welcome.py*.
4) Enter your name in the Textbox.
5) Press the button to get your welcome message.



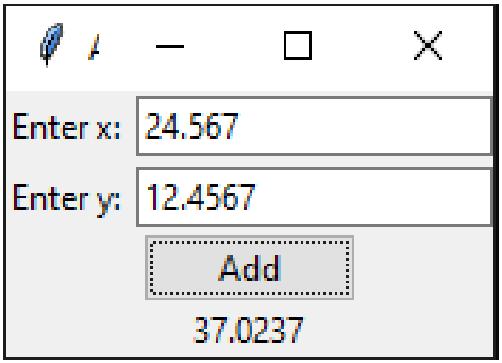

## (92) Creating a GUI to add numbers using Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
from tkinter import *
from tkinter.ttk import *

win = Tk()
win.title("Add numbers")
l1 = Label(win,text="Enter x: ")
```

```
l2 = Label(win,text="Enter y:")
l1.grid(row=0,column=0,sticky=W,pady=2)
l2.grid(row=1,column=0,sticky=W,pady=2)

t1 = Entry(win)
t2 = Entry(win)
t1.grid(row=0,column=1,sticky=W,pady=2)
t2.grid(row=1,column=1,sticky=W,pady=2)

def addnum():
    x = float(t1.get())
    y = float(t2.get())
    z = x+y
    l3.config(text=str(z))

b = Button(win,text="Add",command=addnum)
b.grid(row=2,column=0,rowspan=1,columnspan=2)

l3 = Label(win)
l3.grid(row=3,column=0,columnspan=2)

mainloop()
```




3) Save the script with the name *<copa>add.py*.
4) Enter your numbers for x and y values.
5) Press the button to get the sum of the numbers.

## (93) Creating a GUI to work with string functions in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

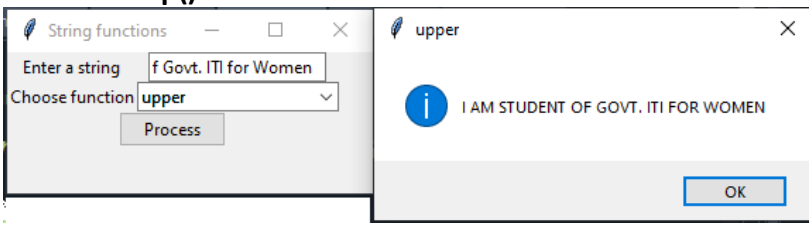
```
from tkinter import *
from tkinter.ttk import *
from tkinter import messagebox
from tkinter import simpledialog

def strfun():
   val = cb.get()
   txt = t.get()
   if(val=="capitalize"):
      messagebox.showinfo(val,txt.capitalize())
   elif(val=="casefold"):
      messagebox.showinfo(val,txt.casefold())
   elif(val=="center"):
      messagebox.showinfo(val,txt.center(10))
   elif(val=="count"):
      x = simpledialog.askstring("Input","Search string")
      messagebox.showinfo(val,str(txt.count(x)))
   elif(val=="encode"):
      messagebox.showinfo(val,txt.encode())
   elif(val=="endswith"):
      x = simpledialog.askstring("Input","Enter string")
      messagebox.showinfo(val,txt.endswith(x))
   elif(val=="expandtabs"):
      x = simpledialog.askinteger("Input","Enter number of
spaces")
      messagebox.showinfo(val,txt.expandtabs(x))
   elif(val=="find"):
      x = simpledialog.askstring("Input","Enter search string")
      messagebox.showinfo(val,txt.find(x))
   elif(val == "format"):
      x = simpledialog.askfloat("Input","Enter a number")
```

```
    s = "This is a float. It is formatted here: {num:.3f}"
    messagebox.showinfo(val,s.format(num=x))
elif(val == "format_map"):
    x = simpledialog.askstring("Input","Enter your name")
    s = "Hello {x}! How are you?"
    messagebox.showinfo(val,s.format_map({"x":x}))
elif(val == "isalnum"):
    messagebox.showinfo(val,txt.isalnum())
elif(val == "isalpha"):
    messagebox.showinfo(val,txt.isalpha())
elif(val == "isascii"):
    messagebox.showinfo(val,txt.isascii())
elif(val == "isdecimal"):
    messagebox.showinfo(val,txt.isdecimal())
elif(val == "isdigit"):
    messagebox.showinfo(val,txt.isdigit())
elif(val == "isidentifier"):
    messagebox.showinfo(val,txt.isidentifier())
elif(val == "islower"):
    messagebox.showinfo(val,txt.islower())
elif(val == "isnumeric"):
    messagebox.showinfo(val,txt.isnumeric())
elif(val == "isprintable"):
    messagebox.showinfo(val,txt.isprintable())
elif(val == "isspace"):
    messagebox.showinfo(val,txt.isspace())
elif(val == "istitle"):
    messagebox.showinfo(val,txt.istitle())
elif(val == "isupper"):
    messagebox.showinfo(val,txt.isupper())
elif(val == "join"):
    x = ("one","two","three")
    messagebox.showinfo(val," ### ".join(x))
elif(val == "ljust"):
    messagebox.showinfo(val,txt.ljust(20))
elif(val == "lower"):
    messagebox.showinfo(val,txt.lower())
```

```
   elif(val == "lstrip"):
      x = simpledialog.askstring("Input","Enter a string with
many spaces at the beginning")
      messagebox.showinfo(val,x.lstrip())
   elif(val == "maketrans" or val == "translate"):
      x = simpledialog.askstring("Input","Enter search string")
      y = simpledialog.askstring("Input","Enter replacement
string")

messagebox.showinfo(val,txt.translate(str.maketrans(x,y)))
   elif(val == "partition"):
      messagebox.showinfo(val,txt.partition("ITI"))
   elif(val == "replace"):
      x = simpledialog.askstring("Input","Enter search string")
      y = simpledialog.askstring("Input","Enter replacement
string")
      messagebox.showinfo(val,txt.replace(x,y))
   elif(val == "rfind"):
      x = simpledialog.askstring("Input","Enter search string")
      messagebox.showinfo(val,txt.rfind(x))
   elif(val == "rindex"):
      x = simpledialog.askstring("Input","Enter search string")
      messagebox.showinfo(val,txt.rindex(x))
   elif(val == "rjust"):
      messagebox.showinfo(val,txt.rjust(30))
   elif(val == "rpartition"):
      messagebox.showinfo(val,txt.rpartition("CO"))
   elif(val == "rsplit"):
      messagebox.showinfo(val,txt.rsplit(" "))
   elif(val == "rstrip"):
      x = simpledialog.askstring("Input","Enter a string with
many spaces to the right")
      messagebox.showinfo(val,x.rstrip())
   elif(val == "split"):
      messagebox.showinfo(val,txt.split(" "))
   elif(val == "splitlines"):
      x = txt.replace(" ","\n")
```

```
        l3.config(text=txt.splitlines())
    elif(val == "startswith"):
        x = simpledialog.askstring("Input","Enter search start
string")
        messagebox.showinfo(val,txt.startswith(x))
    elif(val == "swapcase"):
        messagebox.showinfo(val,txt.swapcase())
    elif(val == "title"):
        messagebox.showinfo(val,txt.title())
    elif(val == "upper"):
        messagebox.showinfo(val,txt.upper())
    elif(val == "zfill"):
        messagebox.showinfo(val,"5".zfill(10))

win = Tk()
win.title("String functions")
l1 = Label(win,text="Enter a string")
l1.grid(row=0,column=0)
t = Entry(win)
t.grid(row=0,column=1)
l2 = Label(win,text="Choose function")
l2.grid(row=1,column=0)
cb = Combobox(win)
cb.grid(row=1,column=1)
cb["values"] = (
    "capitalize","casefold","center","count",
    "encode","endswith","expandtabs","find",
    "format","format_map","index","isalnum",
    "isalpha","isascii","isdecimal","isdigit",
    "isidentifier","islower","isnumeric","isprintable",
    "isspace","istitle","isupper","join",
    "lstrip","maketrans","partition","replace",
    "rfind","rindex","rjust","rpartition",
    "rsplit","rstrip","split",
    "splitlines","startswith","strip","swapcase",
    "title","translate","upper","zfill"
     )
```

```
cb.set("capitalize")
b = Button(win,text="Process",command=strfun)
b.grid(row=2,column=0,columnspan=2)
l3 = Label(win)
l3.grid(row=3,column=0,columnspan=2)
win.mainloop()
```




3) Save the script with the name *<copa>str.py*.
4) Enter some text (your name, etc.) I the text box.
5) Choose a string function.
6) Press Process button to get the result.

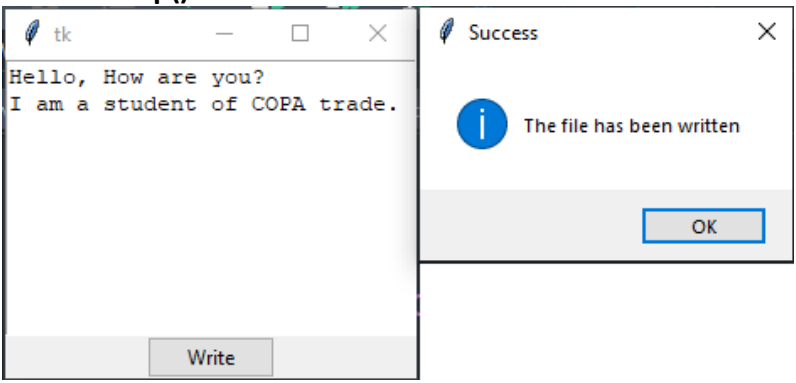
## (94) Creating and writing to files using Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
from tkinter import *
from tkinter.ttk import *
from tkinter import messagebox

def writefl():
   f = open("copa.txt","w")
   txt = t.get("1.0","end-1c")
   f.write(txt)
   f.close()
   messagebox.showinfo("Success","The file has been written")

win = Tk();
t = Text(win,width=30,height=10)
t.pack();
b = Button(win,text="Write",command=writefl)
```

```
b.pack()
win.mainloop()
```



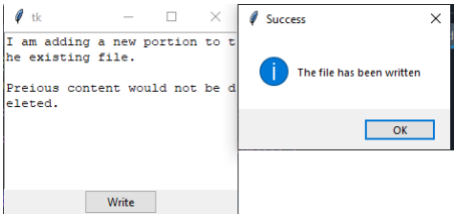

3) Save the script with the name *<copa>flw.py*.
4) Enter some text in the Textbox.
5) Press the button to write the content of the textbox to a file named copa.txt (change the name of file as you wish in the open statement).

## (95) Reading files using Python

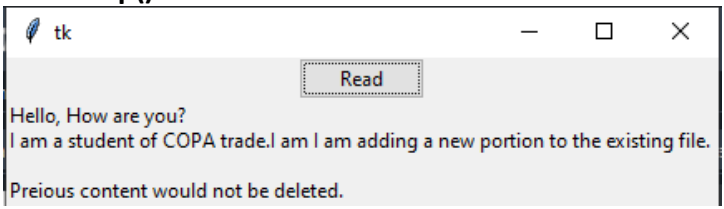
**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
from tkinter import *
from tkinter.ttk import *
from tkinter import messagebox

def readfl():
    f = open("copa.txt","r")
    t = f.read()
    f.close()
    l.config(text=t)

win=Tk()
b = Button(win,text="Read",command=readfl)
b.pack()
l = Label(win)
l.pack()
```



**win.mainloop()**




3) Save the script with the name *<copa>flr.py*.
4) Look at the "r" (for read) provided as the second argument to open function.
5) Press the Read button (replace the file name with the one your provided in the file writing script).
6) The label shows the file contents.

## (96) Appending to a file using Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
from tkinter import *
from tkinter.ttk import *
from tkinter import messagebox

def writefl():
   f = open("copa.txt","a")
   txt = t.get("1.0","end-1c")
   f.write(txt)
   f.close()
   messagebox.showinfo("Success","The file has been written")

win = Tk();
t = Text(win,width=30,height=10)
t.pack();
b = Button(win,text="Write",command=writefl)
b.pack()
win.mainloop()
```

3) Save the script with the name *<copa>fla.py*.
4) File name should remain the same (as provided in the previous 2 exercises).
5) Look at the "a" (for append) provided as the second argument to open function.
6) Enter some text in the text box.
7) Press the Write button. The content gets appended to the file (previous content is preserved).
8) Run the file reading program created in the previous exercise to see the contents of the file.

## (97) Working with numpy module in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import numpy as np

x=[3,9,27]
y=[4,16,64]
print(x)
print(y)
z = np.average(x)
print(z)
z = np.add(x,y)
print(z)
z = np.sin(x)
print(z)
```

3) Save the script with the name *<copa>npy.py*.
4) Run the program and see the results of numpy operation.

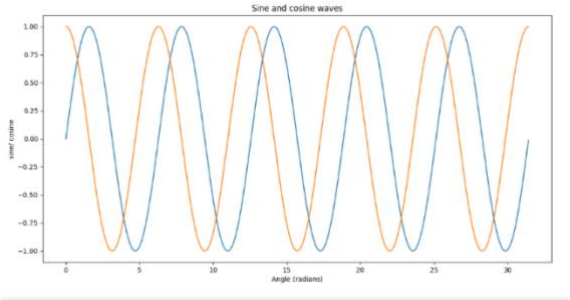
## (98) Drawing sine wave using numpy and matplotlib modules in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.

2) Type the following code in Spyder IDE:

```
import numpy as np
import matplotlib
import matplotlib.pyplot as plt

matplotlib.use('TkAgg')
n=0
i=0
x = []
while(i<31.42):
   x.append(i)
   i += 0.1
   n+=1
y=np.sin(x)
z= np.cos(x)
```




```
plt.plot(x,y,x,z)
plt.xlabel("Angle (radians)")
plt.ylabel("sine/ cosine")
plt.title("Sine and cosine waves")
plt.show()
```

3) Save the script with the name *<copa>sincos.py*.
4) Open Tools->Preferences in Spyder IDE. Click on iPython Console. Open Graphics in the right side tab. Choose Tkinter against Backend.
5) Run the script and see the sine wave and cosine wave appearing in window.

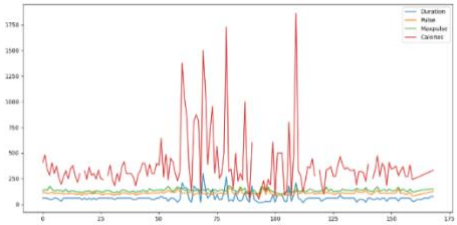
## (99) Reading csv files using pandas module in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import matplotlib
import matplotlib.pyplot as plt
import pandas as pd
```

```
matplotlib.use('TkAgg')
d = pd.read_csv("data.csv")
d.plot()
plt.show()
```




3) Save the script with the name *<copa>panda.py*.
4) Copy the file named data.csv in the same folder as the python script.
5) Run the script to see the graphical results.

## (100) Creating classes and objects in Python

**PROCEDURE**

1) Open Spyder IDE. The IDE shows code window, help window and console window.
2) Type the following code in Spyder IDE:

```
import math
class Series:
#   def __init__(self):


  def sum(self,n):
    s=0
    for i in range(1,n+1,1):
      s+=i
    return s
  def sumsq(self,n):
    s=0
    for i in range(1,n+1,1):
      s+=math.pow(i,2)
    return s
  def fact(self,n):
    f=1
    for i in range(1,n+1,1):
```

```
        f*=i
    return f
  def rev(self,n):
    r = 0
    i=0
    while(n>0):
      r = (n%10)+(r*10)
      n = int(n/10)
      i+=1
    return r
n=int(input("Enter an integer: "))
s = Series()
print("Sum 1+2+...%d = %d" %(n,s.sum(n)))
print("Sum of squares = %d" %(s.sumsq(n)))
print("Factorial of %d = %d" %(n,s.fact(n)))
print("Reverse of %d = %d" %(n,s.rev(n)))
```

3) Run the above program.
4) Provide an integer and get the results for sum of series, sum of squares of series, factorial and reverse.

## (101) Installing Standar Development Kit (SDK) for Java

**PROCEDURE**

1) A compiler called javac is required to convert Java source code to byte code or intermediate code. An interpreter named java is needed to execute the byte code.


2) Standard Development Kit (SDK) for Java is available for free from https://www.oracle.com/ under products section. The exact URL for download would be like https://download.oracle.com/java/20/latest/jdk-20_windows-x64_bin.exe (varies from one version to another).
3) After downloading the executable for the chosen platform (Windows), right click upon the installer and choose Run as Administrator.
4) Press Next for installation note and Next for installation directory (no need to change the default directory).
5) Press Finish after completing the installation of the Java Development Kit (JDK).
6) Note the location of the installation folder in the file system.

## (102) Setting classpath variable in windows

**PROCEDURE**

1) In order to enable compilation of Java programs, a special variable named CLASSPATH needs to be set.
2) Open Control Panel (or Settings). Search for environment variables.
3) The result shows two links. One for editing system environment variables (if you are the administrator) or the User environment variables.
4) Choose to edit System/ User environment variables.
5) System Properties dialog opens. Choose Environment Variables.

6) If a variable named CLASSPATH is already defined, choose Edit.
7) If CLASSPATH is not already defined, choose New and Enter CLASSPATH against variable name.
8) This variable will specify the extra classes and libraries needed where Java should look for class files.
9) Set the value to . (if no other library is needed for Java).
10) Choose PATH variable. Choose Edit. Choose Browse.
11) Select C:\Program Files\Java\jdk-20\bin to enable compilation Java programs.

## (103) Creating a Hello program in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type notepad Hello.java. Choose Yes to create new file.
5) Type the following code:

```
public class Hello
{
public static void main(String arg[]) {
        System.out.println("Hello COPA!\nWelcome to Java programming!");
        }
}
```

6) Save the code and close notepad.
7) Issue the following command in command prompt: *javac Hello,java*
8) If any message is displayed, look at the line number and correct the errors listed therein by invoking notepad Hello.java.
9) When the command javac Hello.java exits silently, the compilation is successful.

10) Issue DIR command to note that a new file named Hello.class has been created by the Java compiler.
11) To run the Hello.class file, issue the command *java Hello.*
12) The result is displayed in the command prompt.

## (104) Use of Java operators

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad Ops.java**. Choose Yes to create new file.
5) Type the following code:

```
public class Ops
{
public static void main(String arg[]) {
        if(arg.length ==0) {
                System.out.println("Usage:        java        Ops
<number>");
                System.exit(1);
                }
        int x = Integer.parseInt(arg[0]);
        System.out.println("Given number: "+x);
        x++;
        System.out.println("++ Operator: "+x);
        x+=5;
        System.out.println("+=5 Operator: "+x);
        x*=3;
        System.out.println("*=3 Operator: "+x);
        x-=3;
        System.out.println("-=3 Operator: "+x);
        x/=2;
        System.out.println("/=2 Operator: "+x);
        x--;
        System.out.println("-- Operator: "+x);
        }
}
```

6) Compile the program using the command **javac Ops.java.**
7) After successful compilation, run the program using the command **java Ops**. The program would display a message for command line argument.
8) Run the same program with a command line argument as follows: **java Ops <number>**.
9) The program will display the working of various operators on given argument.

## (105) Use of data types and Scanner class in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type notepad DataTypes.java. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;
public class DataTypes
{
public int add(int x, int y) {
        return x+y;
        }
public long sub(long x, long y) {
        return x-y;
        }
public double mult(double x, double y) {
        return x*y;
        }
public float div(float x, float y) {
        return x/y;
        }
public String greet(String x) {
```

```
        return "Hello "+x+"!\nWelcome to Java programming!!";
        }
public static void main(String arg[]) {
        Scanner s = new Scanner(System.in);
        int a,b;
        long c,d;
        double e,f;
        float g,h;
        String n;
        DataTypes dt = new DataTypes();
        //Addition of int numbers
        System.out.print("Enter a: ");
        a = s.nextInt();
        System.out.print("Enter b: ");
        b = s.nextInt();
        System.out.println(a+"+"+b+" = "+dt.add(a,b));
        //Subtraction of long numbers
        System.out.print("Enter c: ");
        c = s.nextLong();
        System.out.print("Enter c: ");
        d = s.nextLong();
        System.out.println(c+"-"+d+" = "+dt.sub(c,d));
        //Multiplication of double numbers
        System.out.print("Enter e: ");
        e = s.nextDouble();
        System.out.print("Enter f: ");
        f = s.nextDouble();
        System.out.println(e+"*"+f+" = "+dt.mult(e,f));
        //Division of float numbers
        System.out.print("Enter g: ");
        g = s.nextFloat();
        System.out.print("Enter h: ");
        h = s.nextFloat();
        System.out.println(g+"/"+h+" = "+dt.div(g,h));
        //Getting String input
        System.out.print("Enter your name: ");
```

```
        s.nextLine();
        n = s.nextLine();
        System.out.println(dt.greet(n));
        }
}
```

6) Save the code and close notepad.
7) Issue the following command in command prompt: *javac DataTypes.java*
8) Run the program using the command *java DataTypes*
9) Provide inputs and verify the results.

## (106) Use of Class variables (static), instance variables, local variables and Constructor and methods in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad Student.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.GregorianCalendar;

public class Student
{
static String course = "COPA"; //class variable (static)
String name=null; //instance variable
GregorianCalendar dateOfJoining = null; //instance variable

public Student(String n, GregorianCalendar d) {
        name = n;
        dateOfJoining = d;
        }
private int getMark() {
        java.util.Random r = new java.util.Random();//loal
variable
```

```
        float f = r.nextFloat();
        int mark = Math.round(f*100);
        return mark;
        }
public String toString() {
        return "Hi,\nI am "+name+".\nI joined "+course+"
course on "+
                dateOfJoining.get(GregorianCalendar.YEAR)+"-
"+

        (1+dateOfJoining.get(GregorianCalendar.MONTH))+"-
"+
                dateOfJoining.get(GregorianCalendar.DATE)+
                "\nI scored "+getMark()+" marks through
random luck.";
        }
public static void main(String arg[]) {
        Student s1 = new Student("COPA",new
GregorianCalendar(2022,07,21)),
                s2 = new Student("Pavithra",new
GregorianCalendar(2022,07,30));
        System.out.println(s1.toString());
        System.out.println(s2);
        }
}
```

6) Compile (**javac Student.java)** and run the program (**java Student).**
7) Observer the static class variable (course), instance variables (name, dateOfJoining) and local vriables (r,f,mark).

## (107) Using If … else if … else condition in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).

4) Type **notepad IfTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class IfTest {
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      System.out.print("Enter  mark: ");
      int mark = s.nextInt();
      String grade = "";
      if(mark>=90)
         grade = "S";
      else if(mark >= 80)
         grade = "A";
      else if(mark >= 70)
         grade = "B";
      else if(mark>=60)
         grade = "C";
      else if(mark >= 35)
         grade = "E";
      else
         grade = "F";
      System.out.println("Grade for "+mark+" mark is "+grade);
   }
}
```

6) Compile the code using the command **javac IfTest.java**.
7) Run the program using the command **java IfTest.**

## (108) Using switch … case .. default condition in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).

4) Type **notepad SwitchTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class SwitchTest {
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      System.out.print("Enter  colour name: ");
      String colour = s.nextLine().toLowerCase();
      String code = "";
      switch(colour) {
         case "red":
            code = "#FF0000";
            break;
         case "blue":
            code = "#0000FF";
            break;
         case "green":
            code = "#00FF00";
            break;
         case "while":
            code = "#FFFFFF";
            break;
         case "black":
            code = "#000000";
            break;
         case "purple":
            code = "#FF00FF";
            break;
         default:
            code = "Unknown!!";
         }
      System.out.println("Code for "+colour+" is "+code);
   }
}
```

6) Compile the code using the command **javac SwitchTest.java**.
7) Run the program using the command **java SwitchTest.**

## (109) Using Do loop in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad DoTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class DoTest {
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      double x,y,z;
      int choice = 0;
      String cont = "";
      do {
         System.out.print("Enter x: ");
         x = s.nextInt();
         System.out.print("Enter y: ");
         y = s.nextInt();
         System.out.print("Enter operation\n1 - Add\n2 - 
Subtract\n3 - Multiply\n4-Divide\nEnter your choice: ");
         choice = s.nextInt();
         if(choice == 1)
            z = x+y;
         else if(choice == 2)
            z = x-y;
         else if (choice == 3)
            z = x*y;
```

```
        else if(choice == 4)
            z = x/y;
        else
            z = Double.NaN;
    System.out.println(z);
    s.nextLine();
    System.out.print("\nDo you wish to keep working (y/n): ");
    cont = s.nextLine().toLowerCase();
    } while(cont.startsWith("y"));
  System.out.println("Bye from do ... while loop in java!");
  }
}
```

6) Compile the code using the command **javac DoTest.java**.
7) Run the program using the command **java DoTest.**

## (110) Using While loop in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad WhileTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class WhileTest {
  public static void main(String[] args) {
    Scanner s = new Scanner(System.in);
    long fact = 1;
    int n = 0,i=1;
    System.out.print("Enter number: ");
    n = s.nextInt();
    while(i<=n) {
```

```
        fact *= i;
        i++;
      }
   System.out.println(n+"! = "+fact);
   }
}
```

6) Compile the code using the command **javac WhileTest.java**.
7) Run the program using the command **java WhileTest.**

## (111) Using For loop in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad ForTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class ForTest {
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      long sum = 0;
      int n = 0;
      System.out.print("Enter number: ");
      n = s.nextInt();
      for(int i=1;i<=n;i++)
         sum += i;
   System.out.println("1+...+"+n+" = "+sum);
   }
}
```

6) Compile the code using the command **javac ForTest.java**.
7) Run the program using the command **java ForTest.**

## (112) Using subclasses of Number class in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad NumberClass.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;


public class NumberClass extends JFrame implements ActionListener
{
JTextField tf = new JTextField();
JLabel l = new JLabel("Enter a number");
JButton b = new JButton("Number");
JTextArea ta = new JTextArea(5,30);
JScrollPane sp = new JScrollPane(ta);

public NumberClass() {
        super("Number class");
        JPanel p = new JPanel(new GridLayout(1,2));
        p.add(l);
        p.add(tf);
        JPanel p1 = new JPanel(new FlowLayout());
        p1.add(b);
        b.addActionListener(this);
```

```
        this.add(p,"North");
        this.add(p1,"Center");
        this.add(sp,"South");
        this.pack();
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOS
E);
        this.setVisible(true);
        }
public void actionPerformed(ActionEvent ae) {
        String t = tf.getText().trim();
        if(t.length() == 0) {
                JOptionPane.showMessageDialog(this,"Empty
input","Error",JOptionPane.ERROR_MESSAGE);
                return;
                }
        Number b = new Byte(t), i = new Integer(t), l = new
Long(t), f = new Float(t),
                d = new Double(t);
        String s = "Byte: "+b.toString()+"\n";
        s+= "Integer: "+i.toString()+"\n";
        s+="Long: "+l.toString()+"\n";
        s+="Float: "+f.toString()+"\n";
        s+="Double: "+d.toString()+"\n";
        ta.setText(s);
        }

public static void main(String arg[]) {
        new NumberClass();
        }
}
```

6) Compile the code using the command **javac NumberClass.java**.
7) Run the program using the command **java NumberClass.**
8) JFrame is the main window, JTextField is a single line input element, JLabel is prompt element for input/ message, JButton is a clickable control and JTextArea is a

multiline text element. JScrollPane handles large scrollable elements.

## (113) Character class in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad CharacterClass.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class CharacterClass{
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
         char c;
         System.out.print("Enter a character: ");
         c = s.nextLine().charAt(0);
         System.out.println("Alphabetic:
"+Character.isAlphabetic(c));
         System.out.println("Digit: "+Character.isDigit(c));
         System.out.println("Letter: "+Character.isLetter(c));
         System.out.println("Letter or digit:
"+Character.isLetterOrDigit(c));
         System.out.println("Lowercase:
"+Character.isLowerCase(c));
         System.out.println("Uppercase:
"+Character.isUpperCase(c));
         System.out.println("Space: "+Character.isSpace(c));
         System.out.println("Alphabetic:
"+Character.isAlphabetic(c));
   }
}
```

6) Compile the code using the command **javac CharacterClass.java**.
7) Run the program using the command **java CharacterClass.**

## (114) String class in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad StringClass.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class StringClass
{
   public static void main(String arg[]) {
   Scanner s = new Scanner(System.in);
   System.out.print("Enter a strig: ");
   String x = s.nextLine();
   System.out.print("Enter search string: ");
   String y = s.nextLine();
   System.out.print("Enter replacement string: ");
   String z = s.nextLine();
   System.out.println("Methods of string class at work:");
   System.out.println("Given string: "+x);
   System.out.println("Char at location 2: "+x.charAt(2));
   System.out.println(x+" compared to "+y+":
"+x.compareTo(y));
   System.out.println(x+" starts with "+y+ ":
"+x.startsWith(y));
   System.out.println(x+" ends with "+y+ ": "+x.endsWith(y));
```

```
   System.out.println(x+" starts with "+y+ ":
"+x.startsWith(y));
   System.out.println(x+" index of "+y+ ": "+x.indexOf(y));
   System.out.println(x+" last index of "+y+ ":
"+x.lastIndexOf(y));
   System.out.println(x+" equals "+y+ ": "+x.equals(y));
   System.out.println(x+" equals ignore case "+y+ ":
"+x.equalsIgnoreCase(y));
   System.out.println(x+" cast to lower case
"+x.toLowerCase());
   System.out.println(x+" cast to upper case
"+x.toUpperCase());
   System.out.println(x+" cast to lower case
"+x.toLowerCase());
   System.out.println(x+" length: "+x.length());
   System.out.println(x+" repeated 3 times: : "+x.repeat(5));
   System.out.println(x+" replacing "+y+ " with "+z+":
"+x.replace(y,z));
   System.out.println(x+" split at space : "+x.split(" "));
   System.out.println(x+" substring from location 2 to 6:
"+x.substring(2,6));
   System.out.println(x+" after triming: "+x.trim());
   }
}
```

6) Compile the code using the command **javac StringClass.java**.
7) Run the program using the command **java StringClass.**

## (115) Working with arrays in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).

4) Type **notepad ArrayTest.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class ArrayTest
{
   public static void main(String arg[]) {
   Scanner s = new Scanner(System.in);
   int x[] = {2,5,2,8};
   printArray(x);
   int y[] = new int[5];
   for(int i=0;i<y.length; i++) {
      System.out.print("Enter number for location "+i+": ");
      y[i] = s.nextInt();
      }
   printArray(y);
   }

public static void printArray(int []a) {
   for(int i=0;i<a.length;i++)
      System.out.print("Element at location "+i+": "+a[i]+"\n");
   }
}
```

6) Compile the code using the command **javac ArrayTest.java**.
7) Run the program using the command **java ArrayTest.**

## (116) Method overloading in Java

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).

4) Type **notepad OverLoad.java**. Choose Yes to create new file.
5) Type the following code:

```
import java.util.Scanner;

public class OverLoad
{
   public int add(int x, int y) {
      System.out.println("Integer addition");
      int z = x+y;
      return z;
   }
   public long add(long x, long y) {
      System.out.println("Long addition");
      long z = x+y;
      return z;
   }
   public float add(float x, float y) {
      System.out.println("Float addition");
      float z = x+y;
      return z;
   }
   public double add(double x, double y) {
      System.out.println("Double addition");
      double z = x+y;
      return z;
   }
   public static void main(String arg[]) {
   Scanner s = new Scanner(System.in);
   OverLoad ol = new OverLoad();
   int a,b;
   long c,d;
   float e,f;
   double g,h;
   System.out.print("Enter two integers: ");
   a = s.nextInt();
```

```
   b = s.nextInt();
   System.out.println(ol.add(a,b));
      System.out.print("Enter two long numbers: ");
   c = s.nextLong();
   d = s.nextLong();
   System.out.println(ol.add(c,d));
      System.out.print("Enter two floats: ");
   e = s.nextFloat();
   f = s.nextFloat();
   System.out.println(ol.add(e,f));

   System.out.print("Enter two doubles: ");
   g = s.nextDouble();
   h = s.nextDouble();
   System.out.println(ol.add(g,h));
   }
}
```

6) Compile the code using the command **javac OverLoad.java**.
7) Run the program using the command **java OverLoad.**

## (117) Inheritance in Java (parent class and child class)

**PROCEDURE**

1) Open command prompt (Windows+R, cmd, enter).
2) Create a folder for yourself (md <copa>) if not already creted.
3) Change to the folder of your choice (cd <copa>).
4) Type **notepad ParentChild.java**. Choose Yes to create new file.
5) Type the following code:

```
class Parent
{
String name="", relation = "";

public Parent(String n, String r) {
name = n;
```

```
relation = r;
}
public String getName() {
return name;
}
public String getRelation() {
return relation;
}
}

class Child extends Parent
{
public Child(String n, String r) {
super(n, r);
}
public String getRelation() {
return " in the child class. I am their "+super.getRelation();
}
}

public class ParentChild
{
public static void main(String arg[]) {
Parent p1 = new Parent("Sam","Father"),
p2 = new Parent("Maria", "Mother");

Child c1 = new Child("Peter","Son"), c2 = new
Child("Angel","Daughter"),
c3 = new Child("Jack","Son"), c4 = new
Child("Rose","Daughter");

System.out.println("Hello, I am "+p1.getName()+". I am
"+p1.getRelation());
System.out.println("Hello, I am "+p2.getName()+". I am
"+p2.getRelation());
System.out.println("Hello, I am "+c1.getName()+". I am
"+c1.getRelation());
```

```
System.out.println("Hello, I am "+c2.getName()+". I am
"+c2.getRelation());
System.out.println("Hello, I am "+c3.getName()+". I am
"+c3.getRelation());
System.out.println("Hello, I am "+c4.getName()+". I am
"+c4.getRelation());
}
}
```

6) Compile the code using the command **javac ParentChild.java**.
7) Run the program using the command **java ParentChild.**

## (118) Creating abstract classes and packages in Java

**PROCEDURE**

1) Open command prompt and navigate to your folder.
2) Type the following command to create a directory named series:

   **md series**

3) Open note pad using the command **notepad series\Series.java**, type the following code and compile the code using the command **javac series\Series.java**:

```
package series;

public abstract class Series
{
int n;
public Series(int n) {
        this.n = n;
        }
public int getNum() {
        return n;
        }
public abstract long getResult();
}
```

4) Open note pad using the command **notepad series\Sum.java**, type the following code and compile the code using the command **javac series\Sum.java**:

```
package series;

public class Sum extends Series
{
public Sum(int n) {
        super(n);
        }
public long getResult() {
        long sum = 0;
        for(int i=1; i<=n; i++)
                sum += i;
        return sum;
        }
}
```

5) Open note pad using the command notepad **series\SumSq.java**, type the following code and compile the code using the command **javac series\SumSq.java**:

```
package series;

public class SumSq extends Series
{
public SumSq(int n) {
        super(n);
        }
public long getResult() {
        long sum = 0;
        for(int i=1; i<=n; i++)
                sum += (long)Math.pow(i,2);
        return sum;
        }
}
```

6) Open note pad using the command **notepad AbstractPackage.java**, type the following code and compile the code using the command **javac AbstractPackage.java**:

```
import series.*;
import java.util.Scanner;

public class AbstractPackages
{
public static void main(String arg[]) {
        int n;
        long res1=0, res2=0;
        Scanner s = new Scanner(System.in);
        System.out.print("Enter n: ");
        n = s.nextInt();

        Series s1 = new Sum(n), s2 = new SumSq(n);
        res1 = s1.getResult();
        res2 = s2.getResult();
        System.out.println("Sum for "+n+": "+res1);
        System.out.println("Sum of squares for "+n+": "+res2);
        }
}
```

7) Run the above program using the command **java AbstractPackage.** Enter an input (say 30) and verify the result (that 465 and 9455 are displayed).

## (119) Creating, extending and implementing interfaces in Java

**PROCEDURE**

1) Open command prompt and navigate to your folder.
2) Open notepad using the command **notepad Interface.java**, type the following code:

```
interface Student
{
public String studying();
}

interface SchoolStudent extends Student
{
public String playing();
}

interface CollegeStudent extends SchoolStudent
{
public String labWork();
public String projectWork();
}

class SchoolStud implements SchoolStudent
{
String name = "", subject="", game="";
public SchoolStud(String n, String s, String g) {
        name = n;
        subject = s;
        game = g;
        }
public String studying() {
        return name+": I am studying "+subject;
        }
public String playing() {
        return  ". I am playing "+game;
        }
}

class CollegeStud implements CollegeStudent
{
String name="", subject = "", game="", lab="", project="";
public CollegeStud(String n, String s, String g, String l, String p)
{
```

```
        name=n;
        subject = s;
        game = g;
        lab = l;
        project = p;
        }
public String studying() {
        return name+": I am studying "+subject;
        }
public String playing() {
        return ". I am playing "+game;
        }
public String labWork() {
        return ". I am doing lab work in "+lab;
        }
public String projectWork() {
        return ". I am doing a project on "+project;
        }
}

public class Interface
{
public static void main(String arg[]) {
        SchoolStudent s1 = new
SchoolStud("Asvini","12th","Khokho"),
        s2 = new SchoolStud("Saritha","11th","Volley Ball");
        CollegeStud s3 = new CollegeStud("Gowthami","B.A.
(Tamil)","Football",
                "Linguistics Lab","Ancient Tamil Culcture"),
        s4 = new CollegeStud("Rigana Begam","B.Sc.(Home
Science)","Chess",
                "Food & Hiegiene lab", "Health of impact of
tinned food on young kids");
        System.out.println(s1.studying()+s1.playing());
        System.out.println(s2.studying()+s2.playing());
        System.out.println(s3.studying()+s3.playing()+s3.labW
ork()+s3.projectWork());
```

```
        System.out.println(s4.studying()+s4.playing()+s4.labWork()+s4.projectWork());
        }
}
```

3) Compile the code using the command **javac Interface.java**
4) Run the above program using the command **java Interface.**

## (120) Use Graphics in Java to create a Digital clock in Java

**PROCEDURE**

1) Open command prompt and navigate to your folder.
2) Open notepad using the command **notepad Clock.java**, type the following code:

```
import java.awt.*;
import java.awt.image.*;
import javax.swing.*;
import java.util.*;

public class Clock extends JFrame implements Runnable
{
Canvas c = new Canvas();
BufferedImage bi = null;

public Clock() {
        super("Clock");
        this.add(c);
        Rectangle bound = GraphicsEnvironment.getLocalGraphicsEnvironment().getMaximumWindowBounds();
        this.setBounds(bound);
        bi = new BufferedImage(bound.width,bound.height,BufferedImage.TYPE_INT_RGB);
        this.add(c,"Center");
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        this.add(c,"Center");
        this.setVisible(true);
```

9: 30: 6

```
        new Thread(this).start();
        }
public void run() {
        while(true) {
                java.util.GregorianCalendar tm = new
java.util.GregorianCalendar();
                Dimension dim = this.getSize();
                int w = dim.width, h = dim.height;
                Font f = new Font("Arial Black",Font.BOLD,h/5);
                Graphics g = bi.getGraphics();
                g.setColor(Color.white);
                g.setFont(f);
                g.fillRect(0,0,w,h);
                String s = tm.get(GregorianCalendar.HOUR)+":
"+tm.get(GregorianCalendar.MINUTE)+": "+

        tm.get(GregorianCalendar.SECOND);
                int sw = g.getFontMetrics().stringWidth(s);
                g.setColor(Color.red);
                g.drawString(s,(w-sw)/2,h/2);
                c.getGraphics().drawImage(bi,0,0, this);
                this.repaint();
                System.out.println("Running "+w+", "+h);
                try {Thread.currentThread().sleep(1000);}
                catch(Exception ex) {ex.toString();}
                }
        }
public static void main(String arg[]) {
        new Clock();
        }
}
```

3) Compile the program using the command **javac Clock.java.**
4) Run the above program using the command **java Clock.**

## (121) Creating analog clock in Java

**PROCEDURE**

1) Open command prompt and navigate to your folder.
2) Open notepad using the command **notepad AnalogClock.java**, type the code:

```
import java.awt.*;
import java.awt.image.*;
import javax.swing.*;
import java.util.*;

public class AnalogClock extends JFrame implements Runnable
{
Canvas c = new Canvas();
BufferedImage bi = null;

public AnalogClock() {
	super("Clock");
	this.add(c);
	Rectangle bound =
```


```
GraphicsEnvironment.getLocalGraphicsEnvironment().getMaximu
mWindowBounds();
	this.setBounds(bound);
	bi = new
BufferedImage(bound.width,bound.height,BufferedImage.TYPE_IN
T_RGB);
	this.add(c,"Center");
	this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
	this.add(c,"Center");
	this.setVisible(true);
	new Thread(this).start();
	}
public void run() {
	while(true) {
		java.util.GregorianCalendar tm = new
java.util.GregorianCalendar();
		Dimension dim = this.getSize();
		int w = dim.width, h = dim.height;
		Graphics2D g = (Graphics2D)bi.getGraphics();
		g.setColor(Color.white);
		g.fillRect(0,0,w,h);
		int h1 = tm.get(GregorianCalendar.HOUR), m =
tm.get(GregorianCalendar.MINUTE),
```

```
                                        s =
tm.get(GregorianCalendar.SECOND);

                g.setColor(new Color(200,255,255));
                int rad = h*90/100;
                g.fillOval(w/2-rad/2,h/2-rad/2,rad,rad);

                g.setColor(Color.white);
                rad = h*80/100;
                g.fillOval(w/2-rad/2,h/2-rad/2,rad,rad);

                g.setColor(new Color(250,180,250));
                rad = h*75/100;
                g.fillOval(w/2-rad/2,h/2-rad/2,rad,rad);

                String str = (h1==0?12:h1)+" : "+m+" : "+s;
                Font f = new Font("Times New
Roman",Font.BOLD,h/20);
                g.setFont(f);
                g.setColor(Color.black);
                int sw = g.getFontMetrics().stringWidth(str);
                g.drawString(str,w/2-sw/2,h/4);

                str = "COPA";
                g.setFont(new Font("Times New
Roman",Font.BOLD,h/10));
                sw = g.getFontMetrics().stringWidth(str);
                g.drawString(str,w/2-sw/2,h*4/10);

                double angle = ((45+s)*Math.PI*2.0/60.0);
                int x1 = (int)(w/2+(h*0.4)*Math.cos(angle));
                int y1 = (int)(h/2+(h*0.4)*Math.sin(angle));
                g.setStroke(new BasicStroke(5));
                g.setColor(Color.blue);
                g.drawLine(w/2,h/2,x1,y1);

                angle = ((45+m+s/60.0)*Math.PI*2.0/60 +
angle/60);
                x1 = (int)(w/2+(h*0.3)*Math.cos(angle));
                y1 = (int)(h/2+(h*0.3)*Math.sin(angle));
```

```
                g.setStroke(new BasicStroke(8));
                g.setColor(Color.green);
                g.drawLine(w/2,h/2,x1,y1);

                h1 %= 12;
                angle =
((9+h1+m/60.0+s/60.0/60.0)*Math.PI*2/12);
                x1 = (int)(w/2+(h*0.25)*Math.cos(angle));
                y1 = (int)(h/2+(h*0.25)*Math.sin(angle));
                g.setStroke(new BasicStroke(12));
                g.setColor(Color.red);
                g.drawLine(w/2,h/2,x1,y1);

                g.setColor(Color.black);
                g.setFont(new Font("Times New
Roman",Font.BOLD,h/20));
                FontMetrics fm = g.getFontMetrics();
                int fh = fm.getHeight(), ascent = fm.getAscent();

                for(int i=1; i<=12;i++) {
                        str = ""+i;
                        angle = (9+i)*Math.PI*2.0/12;
                        x1 = (int)(w/2+(h*0.42)*Math.cos(angle));
                        y1 = (int)(h/2+(h*0.42)*Math.sin(angle));
                        sw = fm.stringWidth(str);
                        g.drawString(str,x1-sw/2,y1-fh/2+ascent);
                        }

                g.fillOval(w/2-10,h/2-10,20,20);
                c.getGraphics().drawImage(bi,0,0, this);
                this.repaint();
                try {Thread.currentThread().sleep(1000);}
                catch(Exception ex) {ex.toString();}
                }
        }
public static void main(String arg[]) {
        new AnalogClock();
        }
}
```

3) Compile the program using the command **javac AnalogClock.java.**
4) Fine tune the above program to draw the clock hands and time markers for clock.
5) Run the program using the command **java AnalogClock.**

## (122) Creating offline testing and preparation program using Java

**PROCEDURE**

1) Open ProgEd. Create a new file named **QuestionBank.java**. Type the following content:

```
package copatest;

public class QuestionBank
{
public int getQuestionCount() {
        return q.length;
        }
public String getQuestion(int i) {
        if(i<q.length) {
                String arr[] = q[i].split("#@#@#@");
                return arr[0];
                }
        return null;
        }
public String getA(int i) {
        if(i<q.length)
                return q[i].split("#@#@#@")[1];
        return null;
        }
public String getB(int i) {
        if(i<q.length)
                return q[i].split("#@#@#@")[2];
        return null;
        }
public String getC(int i) {
        if(i<q.length)
                return q[i].split("#@#@#@")[3];
        return null;
```

```
        }
public String getD(int i) {
        if(i<q.length)
                return q[i].split("#@#@#@")[4];
        return null;
        }
public char getAns(int i) {
        if(i<q.length)
                return (q[i].split("#@#@#@")[5]).trim().charAt(0);
        return ' ';
        }
private final String q[]  =  {
        "What is the sequence, in which computer
operates?#@#@#@Input, output, process#@#@#@Input, process,
output#@#@#@Process, input, output#@#@#@Output, process,
input#@#@#@b" ,
        "Which is the first general purpose programmable
electronic
computer?#@#@#@ENIAC#@#@#@EDVAC#@#@#@EDSAC#@#@
#@UNIVAC#@#@#@a" ,
        "What type of device is computer?#@#@#@Electrical
device#@#@#@Electronic device#@#@#@Electro
magnetic#@#@#@Electro mechanical#@#@#@b" ,
        "Who is considered as father of
computer?#@#@#@Charles Babbage#@#@#@John
Lickert#@#@#@John Mauchly#@#@#@M.V Wilkes#@#@#@a" ,
        "Who invented Analytical engine?#@#@#@Charles
Babbage#@#@#@John Lickert#@#@#@John
Mauchly#@#@#@M.V Wilkes#@#@#@a" ,
        "What is the main electronic component of the first
generation computer?#@#@#@Integrated
circuit#@#@#@Microprocessor#@#@#@Transistors#@#@#@Vac
uum tubes#@#@#@d" ,
        "How does the parallel port transfer a byte?#@#@#@Bit
by bit#@#@#@2 bits at a time#@#@#@4 bits at a time#@#@#@8
bits at a time#@#@#@d" ,
        "Which is an internal power supply units of
CPU?#@#@#@CVT#@#@#@UPS#@#@#@SMPS#@#@#@Stabilize
r#@#@#@c" ,
```

```
        "What is the purpose of expansion slot in mother
board?#@#@#@To insert the RAM#@#@#@To insert the
mouse#@#@#@To insert the keyboard#@#@#@To insert the
additional peripherals#@#@#@d",
        "What is the purpose of memory unit in a
computer?#@#@#@Accepts data#@#@#@Displays
data#@#@#@Process data#@#@#@Stores data#@#@#@d" ,
        "How many pins are there in SDR
DIMM?#@#@#@138#@#@#@148#@#@#@158#@#@#@168#@#
@#@d" ,
        "How many pins are there in SIMMs?#@#@#@30 -
72#@#@#@42 - 82#@#@#@52 - 92#@#@#@62 -102#@#@#@a"
        };
}
```

2) Compile the above program using the shortcut Ctrl+K.
3) Create new file named **ReadQuestions.java.** Enter the following code and compile it using the shortcut Ctrl+K:

```
package copatest;
import javax.swing.*;

public class ReadQuestions
{
int st = 0, en=0;
int fontSize=100;
QuestionBank qb = new QuestionBank();
char ans[];

public ReadQuestions() {
        }

public ReadQuestions(int s, int e) {
        setLimits(s,e);
        }
public void setLimits(int s, int e) {
        st = s-1;
        en = e<=qb.getQuestionCount()?e:qb.getQuestionCount();
        ans = new char[en];
        for(int i=0;i<en;i++)
```

```
                    ans[i] = ' ';
          }
public void setFontSize(int x) {
          fontSize = x;
          }
public int getQuestionCount() {
          return qb.getQuestionCount();
          }
public String getQuestion(int n) {
          return "<h1 style='color:red;font-
size:"+fontSize+"%'>"+qb.getQuestion(n)+"</h1>";
          }
public String getA(int n) {
          return "<h2 style='color:black;font-
size:"+fontSize+"%'>"+qb.getA(n)+"</h2>";
          }
public String getB(int n) {
          return "<h2 style='color:black;font-
size:"+fontSize+"%'>"+qb.getB(n)+"</h2>";
          }
public String getC(int n) {
          return "<h2 style='color:black;font-
size:"+fontSize+"%'>"+qb.getC(n)+"</h2>";
          }
public String getD(int n) {
          return "<h2 style='color:black;font-
size:"+fontSize+"%'>"+qb.getD(n)+"</h2>";
          }
public void setGivenAns(char a,int n) {
          ans[n] = a;
          }
public char getGivenAns(int n) {
          return ans[n];
          }
public char getAns(int n) {
          return qb.getAns(n);
          }
public boolean isCorrectAns(int n) {
          return ans[n] != ' '  && ans[n]==qb.getAns(n);
          }
```

```
public String getWrongAnswerList() {
	StringBuilder sb = new StringBuilder("<table>\n");
	for(int i=0;i<en; i++) {
		if(ans[i] != qb.getAns(i))
			sb.append(assembleQuestion(i,i));
		}
	sb.append("</table>");
	return sb.toString();
	}
public String assembleQuestion(int i, int n) {
	String str = "<tr><td style='color:red;font-
size:"+fontSize+"%'>("+(n+1)+")</td><td></td><td>"+getQuestion(
i)+"</td></tr>\n"+
		"<tr><td></td><td style='font-
size:"+fontSize+"%'>(a)</td><td>"+getA(i)+"</td></tr>\n"+
		"<tr><td></td><td style='font-
size:"+fontSize+"%'>(b)</td><td>"+getB(i)+"</td></tr>\n"+
		"<tr><td></td><td style='font-
size:"+fontSize+"%'>(c)</td><td>"+getC(i)+"</td></tr>\n"+
		"<tr><td></td><td style='font-
size:"+fontSize+"%'>(d)</td><td>"+getD(i)+"</td></tr>\n";
	if(isCorrectAns(i))
		str += getAnswer(i,ans[i],"Given answer: ");
	str += getAnswer(i,qb.getAns(i),"Correct answer: ");
	return str;
	}
private String getAnswer(int i,char a, String s) {
	String t1 = "<tr><td></td><td></td><td
style='color:#006600;font-size:"+fontSize+"%;font-weight:bold'>",
		t2 = "</td></tr>\n";
	if(a == ' ')
		return t1+s+t2;
	if(a == 'a')
		return t1+s+" (a) "+qb.getA(i)+t2;
	if(a == 'b')
		return t1+s+" (b) "+qb.getB(i)+t2;
	if(a=='c')
		return t1+s+" (c) "+qb.getC(i)+t2;
	if(a=='d')
		return t1+s+" (d) "+qb.getD(i)+t2;
```

```
        return null;
        }
}
```

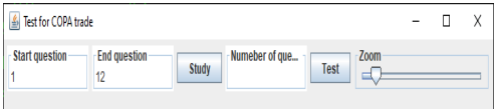
4) Create a file named **QuestionPanel.java**. Enter the following code and compile it using the menu Program->Compile/Make or the shortcut Ctrl+K:

```
package copatest;

import javax.swing.*;
import java.awt.event.*;

public class QuestionPanel extends JPanel implements ItemListener
{
JTextPane qp = new JTextPane();
JRadioButton rba = new JRadioButton(),
        rbb = new JRadioButton(),
        rbc = new JRadioButton(),
        rbd = new JRadioButton();
ReadQuestions rq = null;
int qn = 0;
ButtonGroup bg = new ButtonGroup();

QuestionPanel() {
        qp.setContentType("text/html");
        qp.setEditable(false);

        bg.add(rba);
        bg.add(rbb);
        bg.add(rbc);
        bg.add(rbd);
        rba.addItemListener(this);
        rbb.addItemListener(this);
        rbc.addItemListener(this);
        rbd.addItemListener(this);

        this.setLayout(new BoxLayout(this,BoxLayout.Y_AXIS));
        this.add(qp);
        this.add(rba);
        this.add(rbb);
```

```
        this.add(rbc);
        this.add(rbd);
        }

public void setQuestionReader(ReadQuestions r) {
        rq = r;
        }

public void setQuestion(int n) {
        if(n>= rq.getQuestionCount())
                return;
        qn = n;

        qp.setText(rq.getQuestion(n));
        rba.setText("<html>"+rq.getA(n)+"</html>");
        rbb.setText("<html>"+rq.getB(n)+"</html>");
        rbc.setText("<html>"+rq.getC(n)+"</html>");
        rbd.setText("<html>"+rq.getD(n)+"</html>");
        bg.clearSelection();
        char ga = rq.getGivenAns(n);
        if(ga == 'a')
                rba.setSelected(true);
        else if(ga == 'b')
                rbb.setSelected(true);
        else if(ga == 'c')
                rbc.setSelected(true);
        else if(ga == 'd')
                rbd.setSelected(true);
        }
public void itemStateChanged(ItemEvent ae) {
        if(qn<0)
                return;
        if(rba.isSelected())
                rq.setGivenAns('a',qn);
        else if(rbb.isSelected())
                rq.setGivenAns('b',qn);
        else if(rbc.isSelected())
                rq.setGivenAns('c',qn);
        else if(rbd.isSelected())
                rq.setGivenAns('d',qn);
```

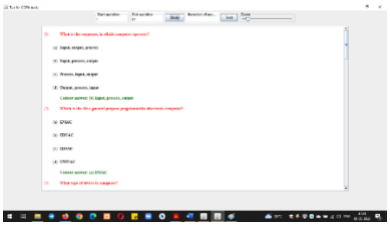
```
        }

public boolean isAnswered(int n) {
        char a = rq.getGivenAns(n);
        return a=='a' || a=='b' || a=='c' || a=='d';
        }
}
```

5) Create a file named **TestMaker.java**. Enter the following code and compile it.




```
package copatest;
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;

public class TestMaker extends JFrame implements ActionListener,
javax.swing.event.ChangeListener
{
ReadQuestions rq = new ReadQuestions();
java.util.ArrayList<Integer> selected = new
java.util.ArrayList<Integer>();
JTextField st = new JTextField(10), en = new JTextField(10), nq =
new JTextField(10);
JButton test = new JButton("Test"), study = new JButton("Study");
JPanel displayPanel = new JPanel(),
        numberPanel = new JPanel();
int b,e,n;
final QuestionPanel qp = new QuestionPanel();
int fontSize = 100;
JSlider slider = new JSlider(JSlider.HORIZONTAL,50,500,100);
JTextPane tp = new JTextPane();
final java.util.ArrayList<Integer> currentQuestion = new
java.util.ArrayList<Integer>();
java.util.ArrayList<JButton> buttonList = new
java.util.ArrayList<JButton>();
String name = "";
JButton prev = new JButton("<<Previous"), nxt = new
JButton("Next>>"), done = new JButton("Done");
JPanel buttonPanel = new JPanel(new GridLayout(1,2));
```

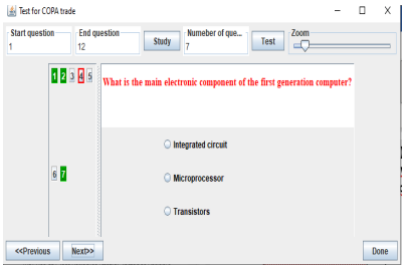
```
public TestMaker() {
        super("Test for COPA trade");
        tp.setContentType("text/html");
        tp.setEditable(false);
        st.setBorder(BorderFactory.createTitledBorder("Start
question"));
        en.setBorder(BorderFactory.createTitledBorder("End
question"));
        slider.setBorder(BorderFactory.createTitledBorder("Zoom"
));
        slider.setPaintLabels(true);
        en.setText(""+rq.getQuestionCount());
        nq.setBorder(BorderFactory.createTitledBorder("Numeber
of questions"));
        study.addActionListener(this);
        test.addActionListener(this);
        slider.addChangeListener(this);
        JPanel p = new JPanel(new FlowLayout());
        p.add(st);
        p.add(en);
        p.add(study);
        p.add(nq);
        p.add(test);
        p.add(slider);
        this.add(p, "North");
        this.add(displayPanel, "Center");
        JPanel p1 = new JPanel(new FlowLayout(FlowLayout.LEFT)),
                p2 = new JPanel(new
FlowLayout(FlowLayout.RIGHT));
        p1.add(prev);
        p1.add(nxt);
        p2.add(done);
        prev.addActionListener(this);
        nxt.addActionListener(this);
        done.addActionListener(this);
        buttonPanel.add(p1);
        buttonPanel.add(p2);
        this.pack();
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
```



```
        this.setVisible(true);
        }
public void actionPerformed(ActionEvent ae) {
        String com = ae.getActionCommand();
        b = Integer.parseInt(st.getText().trim());
        e = Integer.parseInt(en.getText().trim());
        Rectangle r =
GraphicsEnvironment.getLocalGraphicsEnvironment().getMaximu
mWindowBounds();
        if(com.equals("Study")) {
                rq.setLimits(b,e);
                displayPanel.removeAll();
                tp.setText(rq.getWrongAnswerList());
                JScrollPane sp = new JScrollPane(tp);
                sp.setPreferredSize(new
Dimension(r.width*8/10,r.height*8/10));
                displayPanel.add(sp);
                sp.revalidate();
                this.remove(buttonPanel);
                displayPanel.revalidate();
                this.revalidate();
                this.pack();
                return;
                }
        else if(com.equals("Test"))
                startTest();
        else if(com.equals("<<Previous"))
                moveQuestion(-1);
        else if(com.equals("Next>>"))
                moveQuestion(1);
        else if(com.equals("Done")) {
                displayPanel.removeAll();
                this.remove(buttonPanel);
                tp.setText(getAnswerList());
                JScrollPane sp = new JScrollPane(tp);
                tp.revalidate();
                sp.setPreferredSize(new
Dimension(r.width*8/10,r.height*8/10));
                displayPanel.add(sp);
                this.revalidate();
```

```
                this.pack();
                this.revalidate();
                }
        }
private void moveQuestion(int n) {
        int qn = currentQuestion.get(0);
        if(qn == 0 && n<0)
                qn = selected.size()-1;
        else if(qn == selected.size()-1 && n > 0)
                qn = 0;
        else
                qn+=n;
        currentQuestion.clear();
        currentQuestion.add(qn);
        qp.setQuestion(selected.get(qn));
        this.revalidate();
        setButtonColors();
        }
private void startTest() {
        n = Integer.parseInt(nq.getText().trim());
        name = JOptionPane.showInputDialog(this, "Enter your
name","Name please",JOptionPane.OK_OPTION);
        populateQuestions();
        rq.setLimits(b,e);
        qp.setQuestionReader(rq);
        JSplitPane sp = new
JSplitPane(JSplitPane.HORIZONTAL_SPLIT);
        sp.setDividerLocation(0.2);
        sp.setLeftComponent(prepareNumberPanel());
        currentQuestion.clear();
        currentQuestion.add(0);
        qp.setQuestion(selected.get(0));
        setButtonColors();
        JScrollPane scrPane = new JScrollPane(qp);
        sp.setRightComponent(qp);
        displayPanel.removeAll();
        displayPanel.add(sp,"Center");
        this.add(buttonPanel,"South");
        setButtonColors();
        displayPanel.revalidate();
```

```
        this.pack();
        this.revalidate();
        }
private JPanel prepareNumberPanel() {
        numberPanel.removeAll();
        numberPanel.setLayout(new
GridLayout(selected.size()/5+1,1));
        JPanel p = new JPanel(new FlowLayout(FlowLayout.LEFT));
        buttonList.clear();
        for(int i=0;i<selected.size(); i++) {
                int qn = selected.get(i);
                JButton b = new JButton(""+(i+1));
                p.add(b);
                buttonList.add(b);
                b.addActionListener(new ActionListener() {
                        public void actionPerformed(ActionEvent
ae) {
                                currentQuestion.clear();

        currentQuestion.add(selected.indexOf(qp));
                                qp.setQuestion(qn);
                                setButtonColors();
                                }
                        });
                if((i+1)%5==0) {
                        numberPanel.add(p);
                        p = new JPanel(new
FlowLayout(FlowLayout.LEFT));
                        }
                }
        if(selected.size()%5 !=0)

        numberPanel.add(p);
        this.revalidate();
        this.pack();
        return numberPanel;
        }
public  void stateChanged(javax.swing.event.ChangeEvent ce) {
        int val = slider.getValue();
        rq.setFontSize(val);
```



```
        tp.setText(rq.getWrongAnswerList());
        if(currentQuestion.size() > 0)
                qp.setQuestion(currentQuestion.get(0));
        qp.revalidate();
        this.revalidate();
        this.pack();
        }
private boolean checkCondition() {
        if(b < e && n<=(e-b-1))
                return true;
        JOptionPane.showMessageDialog(this,"Please check start,
end and number of questions","Error",
                JOptionPane.ERROR_MESSAGE);
        return false;
        }
public void setButtonColors() {
        Color c = new Color(0,150,0);
        int qn = currentQuestion.get(0);
        JButton b = null;
        for(int i=0;i<selected.size(); i++) {
                int n = selected.get(i);
                b = buttonList.get(i);
                if(qp.isAnswered(n)) {
                        b.setBackground(c);
                        b.setForeground(Color.white);
                        }
                if(qn == i)

        b.setBorder(BorderFactory.createLineBorder(Color.red,2));
                else

        b.setBorder(BorderFactory.createEtchedBorder());
                }
        }
private void populateQuestions() {
        java.util.Random ran = new
java.util.Random(System.currentTimeMillis());
        selected.clear();
        for(int i=0;selected.size() < n; i++) {
```

```
                int r = b+(int)Math.round(ran.nextDouble()*(e-b-
1));
                if(!selected.contains(r))
                        selected.add(r);
                }
        }
public String getAnswerList() {
        int nq = selected.size(),nc=0;
        StringBuilder sb = new StringBuilder("<table>\n");
        for(int i=0;i<nq; i++) {
                int qn = selected.get(i);
                sb.append(rq.assembleQuestion(qn,i));
                if(rq.isCorrectAns(qn))
                        nc++;
                }
        sb.append("</table>");
        String mark = "<center><h1 style='font-size:300%'>Name:
"+name+"<br />Mark: "+Math.round(nc*100.0/nq)+" /
100</h1></center>\n";
        return mark+sb.toString();
        }
public static void main(String arg[]) {
        new TestMaker();
        }
}
```

6) Run the above program using the menu Program->Run Program or the shortcut Ctrl+R.

## (123) Installing GIMP

**PROCEURE**

1) GIMP (GNU Image Manipulation Program) is a free software available for download from the website https://www.gimp.org/.
2) Right click on the installer, choose the language, accept the license agreement and complete the installation.
3) Complete the installation and press Finish button.

## (124) Correcting low-light photo using GIMP

**PROCEDURE**

1) Open the low-light photo using GIMP.

2) Choose Colors->Levels. Drag the input pointer to the area having most pixels (probably left). (Colors->Curves may do the same when dragged upwards).
3) Adjust output levels if necessary.

## (125) Correcting over-exposed photos using GIMP

**PROCEDURE**

1) Open the low-light photo using GIMP.
2) Choose Colors->Levels. Drag the input pointer to the area having most pixels (probably right). (Colors->Curves may do the same when dragged downwards).
3) Adjust the output levels if necessary.

## (126) Creating passport size photo layout using GIMP

**PROCEDURE**

1) Open given photo in GIMP. Crop the photo and adjust colours if necessary. Copy the photo.
2) Create a new canvas (File-New) with size 1.5”x2” and white background.
3) Paste the copied photo and adjust the location.
4) Choose Edit->Copy Visible.
5) Choose File->New. Create a canvas with size 12”x8” and white background.
6) Choose Bucket Fill. Select Pattern fill and Clipboard options.
7) Click upon the new canvas (12”x8”). Passport size photos are laid out properly. Print the photos.

## (127) Creating post-card size photos using GIMP

**PROCEDURE**

1) Open the photos and correct the photos if necessary.
2) Crop and scale the photos to 6”x4” size (postcard size).
3) Create a new canvas having 12”x8” size.
4) Drag the top ruler down and place it as 4” distance. Drag the left side ruler to the right and place the divider at 6” distance.
5) Place 4 photos per page of 12”x8” size.
6) Export the photos to JPG format.

## (128) Creating album layout using GIMP

**PROCEDURE**

1) Open GIMP. Choose File->New.
2) Set unit to inch. Set the size to 18”x11” and background colour to white and create a canvas.
3) Open each photo. Copy the photo and paste it on the new album pager.
4) If one photo is laid over another photo, use blur tool, dodge tool to make the intersection lines less prominent.
5) Export the resulting album pages to JPEG format.

## (129) Restoration of damaged photos using GIMP

**PROCEDURE**

1) Open damaged photo in GIMP.
2) Assess the damages.
3) Use clone stamp tool. Press Ctrl key and click using the mouse to take sample.
4) Click upon required area to apply the sample.
5) Repeat the process of taking sample and applying the same.
6) Care should be taken while restoring eyes, eyebrows, nose, lips, chin and ear.
7) Place the damaged photo and restored photo side by side and print them.

## (130) Colouring of black and white photo using GIMP

**PROCEDURE**

1) Open black and white photo using GIMP.
2) Open the sample colour photo (for grabbing coulours).
3) Go to Window->Dockable Dialogs->Palettes and open palettes toolbox.
4) Right click upon the source layer and choose Duplicate Layer.
5) Press the new palette button. Create a blank palette. Name it skin.
6) Choose ink picker tool with sample average option and Foreground as the target.
7) Take sample of skin colour from the darkest skin tone area. Click add colour button at the bottom of palette toolbox.
8) Pick a lighter skin tone and add it to palatte. Take at least four sample from darkest colour to lightest colour.

9) Go to Colours->Mask->Palette Mask. Choose a suitable mode (LCh color or normal or LCh Chroma).
10) Go to Layers->Mask->Add Layer Mask. Choose Black Full Transparency.
11) Choose paint brush tool with appropriate hardness. Choose white in the foreground color. Apply the chosen colour to all skin areas.
12) Repeat steps 4 to 11 for applying colours to various areas (like hair, lips, dress).
13) Place the source image and coloured image side by side and print the result.

## (131) Donning cap, spectacles and ornaments to a photo

**PROCEDURE**

1) Open the target image using GIMP.
2) Open the ornaments like cap, chain etc.
3) Remove unwanted portions. Resize the objects. Scale the objects to appropriate size to suit the target image.
4) The ornament should have transparent background. Copy the ornament.
5) Paste the ornament as a new layer using Edit->Paste as->New layer.
6) Reposition and resize the ornament to suit the target image.
7) While preparing spectacles, remove all unwanted portions and use bucket fill with any colour and 50% (or auitable) opacity to fill both the rims of the spectacle.
8) Place the original and the decorated images side by side and print the result.

## (132) Creating posters using Inkscape

**PROCEDURE**

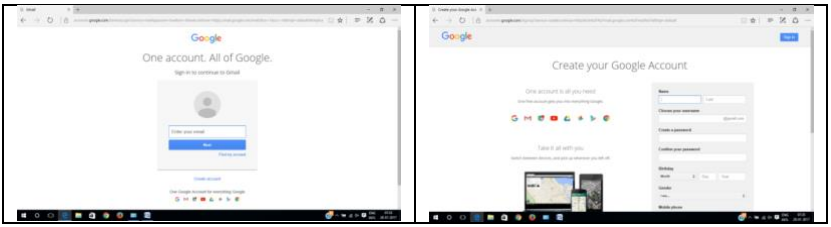
1) Open Inkscape. Choose new project. Go to File->Document Properties. Choose A3 paper with Landscape layout.
2) Insert a background colour map.
3) Type the given text and place the images appropriately.
4) Text and images can be resized by dragging the corners.
5) Save the document as Scalable Vector Graphics (SVG) notation.

6) Export the document to JPG format (or any other suitable format) for printing.

## (133) To create an email ID.

**PROCEDURE**

1) Open browser. Enter the address of the email server (e.g. mail.google.com, mail.yahoo.com, rediffmail.com, fastmail.fm, www.hotmail.com, etc.).
2) When the login screen appears, choose create new account.




3) Enter your name in the first name field. Enter family name in the last name field. If there is a middle name field, enter your father name.
4) Enter a tentative user ID. If this ID is not available, change it to a new ID till it is accepted.
5) Enter a password (at least 6 characters in length). Re-enter the password. Usually, a strong password contains at least 1 capital letter, 1 small letter and 1 symbol.
6) Enter date of birth. Choose your gender (e.g. female).
7) Enter alternate email ID.
8) If it asks for mobile verification, enter your mobile number and confirm the code.
9) Go to your inbox and open the welcome messages.

## (134) Sending email with attachment

**PROCEDURE**

1) Open your browser. Enter your email server address (e.g. mail.google.com) in the address bar.
2) Click compose (or write).

3) Enter email ID of the recipient in the To address. Enter visible copy recipient in the CC field. Enter invisible recipient in the BCC field.
4) Enter a subject (one line description of your email message).
5) Type the email message.
6) Click the **A** icon or clip icon to select any file that should be attached to your email. Attachment for an email is optional.
7) Click send button.

## (135) Search the web for information

**PROCEDURE:**

1) Open browser (Press Windows+R, type iexplore and press enter).
2) Enter the URL www.google.com in the address bar of the browse and press enter.
3) Enter any keyword in the search box (like generations of computer, UNIX, Windows 10, etc.).
4) Press the search button and find the results.
5) Click some of the results based on summary and read the information.
6) Change the result type from web to image or video or news or book. Look at the change in results.
7) Change the search language and do the search in local language.
8) Do not click to open sites that promise offer money, music or video unless you are sure about their authenticity. The sites may lead to great scandals and implant viruses in computer.
9) While entering keywords, follow the advices given below:

a. Keep it short: The fewer words you use, the more accurate your search will be. Every time you add a new word to the mix, you limit your results.
b. Use quotes: Double quotes around a set of words tells Google to consider the exact words in that exact order without any change.
c. Search a web site: Google allows you to specify that your search results must come from a given website. For example, try alyssa site:sitepoint.com to get your Alyssa fix.
d. Search a domain extension: Use the “site” operator above to search a whole class of sites. Try elearning site:.edu to find online learning tools provided by an educational institution.
e. Tell it what you don’t want: Use a minus sign (-) to signify words you do not want to appear in your results. The minus sign should appear immediately before the word and should be preceded with a space (so it’s not confused with a hyphen).
f. Be picky about what you don’t want: You can exclude as many words as you want by using the minus sign in front of each one. You can also exclude more than just words. For example, place a hyphen before the “site” operator to exclude a specific site from your search results. Try this: web developer forum -site:sitepoint.com.
g. Search for this or that: Use OR between words (in all CAPS) or the pipe symbol (|) to allow either one of several words.
h. Use the wildcard: The asterisk (*) tells Google to treat the star as a placeholder for any unknown

term(s) and then find the best matches. Try: w3c founded *

i. Avoid synonyms: Force Google to skip their synonym suggestions by using a plus sign (+). This works just like using double quotes around your search terms. Try a search using both methods and compare the results.
j. Do a specialty search: Using certain syntax can turn Google Search into an even more powerful tool.
k. Sports scores: Type the team or league name.
l. Track packages: Type your tracking number for UPS, Fedex or USPS packages.
m. Weather: Type “weather” followed by the name of the city or zipcode.
n. Unit conversion: Enter your desired conversion for height, weight and volume measurements (i.e. 5 cups in ounces).

10) Calculator: Enter the calculation you’d like the answer to.