LAB CYCLE –II

//style.css(same style file for every program)

```
body
{
	background-color: #505050;
	text-align: center;
	font-family: Calibri;
}
input
{
	width: 25%;
	padding: 10px;
	padding-right: 10px;
	margin-top: 5px;
	margin-bottom: 15px;
	border: 3px solid gray;
	border-radius: 20px;
	box-sizing: border-box;
	font-size: 16px;
}
input[type="submit"],input[type="reset"], button
{
	background-color: #FF9500;
	color: #fff;
	padding: 10px;
	border: none;
	border-radius: 4px;
	cursor: pointer;
	font-size: 16px;
	margin-top: 10px;
```

```
        margin-bottom: 15px;
        width: auto;
}
input[type="submit"]:hover, input[type="reset"]:hover, button:hover
{
   transform: scale(1.2);
   transition:all 300ms ease;
        background-color: #fff;
   color:#FF9500
}
div
{
        margin-top: 50px;
        margin-bottom: 50px;
}
.output
{
        border:3px solid #D4D4D2;
   border-radius: 10px;
   background-color:  #1C1C1C;
   color: white;
        width:max-content;
   padding:10px;
}
.output:hover{
   transform: scale(1.2);
   transition:all 300ms ease;
}
span
{
```

```
        font-size: 25px;
        font-weight:bold;
}
label{
        color:#D4D4D2;
        font-size: 25px;
        font-weight:bold;
}
img
{
        width: 45%;
        border: 3px solid black;
}
td{
    text-align: center;
    height: 30px;
    width:30px;
}
```

1. Write a java scripts to

a) find the given year is leap year or not

Source-Code:

```
<html>
   <head>
      <title>leap or not</title>
      <link rel="stylesheet" href="style.css">
      <script>
         function isleapyear(y)
         {
            if(y%4==0 && y%100!=0 || y%400==0){
               return true;
            }
            else{
               return false;
            }
         }

         function getYear()
         {
            let year = parseInt(document.getElementById("year").value);
            let answer = '';

            if(year>0 && year<=9999)
            {
               if(isleapyear(year))
                  answer = year + " is a Leap Year";
               else
                  answer = year + " is not a Leap Year";
            }
```

```
                else
                    answer = "Invalid Year!";

                document.getElementById("output").innerHTML = answer;
            }
        </script>
    </head>
    <body>
        <div>
            <center>
                <label for="year">Enter a year:</label>
                <input type="number" id="year"><br>
                <input type="submit" value="SUBMIT"
onclick="getYear();"><br><br>
                <span id="output" class="output"></span>
            </center>
        </div>
    </body>
</html>
```

b) compute the biggest of three numbers

Source-Code:

c) perform the arithmetic operations using switch statement

Source-Code:

2. Write a java script to

a) calculate the sum of the digits of a give number

Source-Code:

```
<html>
```

```
        <head>
            <title>sum of digits</title>
            <link rel="stylesheet" href="style.css">
            <script>
                function nsum(){
                    let n=document.getElementById("n").value;
                    let num=n;
                    let s=0;
                    s=parseInt(s);
                    let r=0;
                    r=parseInt(r);
                    while(n){
                        r=n%10;
                        s=s+r;
                        n=Math.floor(n/10);
                    }
                    document.getElementById("sout").innerHTML="Sum of the digits of
"+num+" is "+s;
                }


            </script>
        </head>
        <body>
            <center>
                <label for="n">Enter a Number:</label><br>
                <input type="number" id="n" required><br>
                <input type="submit" value="OK" onclick="nsum()" required><br><br>
                <span id="sout" class="output"></span>
            </center>
        </body>
    </html>
```

b) reverse of a given number

Source-Code:

```
<html>
   <head>
      <title>palindrome</title>
      <link rel="stylesheet" href="style.css">
      <script>
         function REV(){
            let n=document.getElementById("rev").value;
            let num=n;
            let r=0;
            while(n!=0){
               r=r*10+(n%10);
               n=Math.floor(n/10);
            }
            document.getElementById("revout").innerHTML="The reverse of number "+num+" is "+r;
         }
      </script>
   </head>
   <body>
      <center>
         <label for="rev">Enter a number:</label><br>
         <input type="number" id="rev" required><br>
         <input type="submit" value="OK" onclick="REV()"><br><br>
         <span id="revout" class="output"></span>
      </center>
   </body>
</html>
```

c) print the first 10 natural numbers except 5

Source-Code:

```
<html>
   <head>
      <title>first 10 natural numbers except 5</title>
      <link rel="stylesheet" href="style.css">
   </head>
   <body>
      <center>
         <label>First 10 natural numbers except 5 are:</label><br><br><br>
         <span id="nn" class="output"></span>
      </center>
      <script>
         let a=new Array();
         for(i=1;i<=10;i++){
            if(i!=5)
            {
               a.push(i);
            }
         }
         document.getElementById("nn").innerHTML=a;
      </script>
   </body>
</html>
```

3. Write a java script to

a) functions (GCD, reverse, random numbers)

Source-Code:

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

```
<title>GCD Reverse Random</title>
<link rel="stylesheet" href="style.css">
<script>
   function GCD(){
   let n1=document.getElementById("n1").value;
   let n2=document.getElementById("n2").value;
   let max=0,d=0,b=0,s=0;
   if(n1>n2){
      b=n1;
      s=n2;
   }
   else{
      b=n2;
      s=n1;
   }
   for(i=1;i<=b;i++){
      if((b%i==0) && (s%i==0)){
         d=i;
         if(max<d){
            max=d;
         }     s
      }
   }
   document.getElementById("gcdout").innerHTML="The GCD of "+n1+" and
"+n2+" is "+max;
}

function REV(){
   let n=document.getElementById("rev").value;
   let num=n;
   let r=0;
```

```
            while(n!=0){
                r=r*10+(n%10);
                n=Math.floor(n/10);
            }
            document.getElementById("revout").innerHTML="The reverse of number
"+num+" is "+r;
        }

        function RAN()
        {
            let n=Math.floor(Math.random()*10);
            document.getElementById("ranout").innerHTML="The random number is:
"+n;
        }
        </script>
    </head>
    <body>
        <center>
            <label for="n1">Enter 1st Number:</label><br>
            <input type="number" id="n1" required><br>
            <label for="n2">Enter 2nd Number:</label> <br>
            <input type="number" id="n2" required><br>
            <input type="submit" value="OK" onclick="GCD()" equired><br><br>
            <span id="gcdout" class="output"></span><br><br><br>

            <label for="rev">Enter a Number:</label> <br>
            <input type="number" id="rev" required><br>
            <input type="submit" value="OK" onclick="REV()" required><br><br>
            <span id="revout" class="output"></span><br><br>

            <label>Click Below to Generate Random Number</label><br>
```

```
            <input type="submit" value="OK" onclick="RAN()"><br><br>
            <span id="ranout" class="output"></span><br>
        </center>
    </body>
</html>
```

b)recursive function(factorial, Fibonacci , power)

Source-Code:

```
<html>
    <head>
        <title>factorial fibonacci power</title>
        <link rel="stylesheet" href="style.css">
        <script>
            function FACT(){
                let n=document.getElementById("fact").value;
                let num=n;
                function myfact(n){
                    if(n==0){
                        return 1;
                    }
                    else if(n==1){
                        return 1;
                    }
                    else{
                        return n*myfact(n-1);
                    }
                }
                document.getElementById("factout").innerHTML="The Factorial of
"+n+" is "+myfact(n);
            }
```

```
            function FIBO(){
                let fn=document.getElementById("fibo").value;
                function myfibo(fn){
                    if(fn==0){
                        return 0;
                    }
                    if(fn==1 || fn==2){
                        return 1;
                    }
                    return (myfibo(fn-1)+myfibo(fn-2));
                }
                document.getElementById("fiboout").innerText= fn+" th Fibonacci
number is: "+myfibo(fn);
            }

            function POW(){
                let b=document.getElementById("num").value;
                let p=document.getElementById("pow").value;
                function mypow(b,p){
                    if(p==0){
                        return 1;
                    }
                    else{
                        return (b*mypow(b,p-1));
                    }
                }
                document.getElementById("powout").innerHTML= b+" power "+p+" is:
"+mypow(b,p);
            }
        </script>
    </head>
```

```
    <body align="center">
        <label for="func">Enter a number to find it's factorial:</label>
        <input type="number" id="fact"><br>
        <input type="submit" value="OK" onclick="FACT()"><br>
        <br><span id="factout" class="output"></span><br>

        <br><label for="fibo">Enter a number</label>
        <input type="number" id="fibo"><br>
        <input type="submit" value="OK" onclick="FIBO()">
        <br><br><span id="fiboout" class="output"></span><br>

        <br><label for="num">Enter a number:</label>
        <input type="number" id="num"><br>
        <label for="pow">Enter a power:</label>
        <input type="number" id="pow"><br>
        <input type="submit" value="OK" onclick="POW()"><br>
        <br><span id="powout" class="output"></span>
    </body>
</html>
```

c) image generator

Source-Code:

```
<html>
    <head>
        <title>Random Image Generator</title>
        <link rel="stylesheet" type="text/css" href="style.css">
    </head>
     <body>
        <div>
            <input type="submit" value="Generate Image" onclick="imgGen()">
```

```
            <center id="output"></center>
        </div>
        <script>
          let Img = new Array(9);

          Img[0]="image1.jpeg";
          Img[1]="image2.jpeg";
          Img[2]="image3.jpeg";
          Img[3]="image4.jpeg";
          Img[4]="image5.jpeg";
          Img[5]="image6.jpeg";
          Img[6]="image7.jpeg";
          Img[7]="image8.jpeg";
          Img[8]="image9.jpeg";
          function imgGen(){
              let number=Math.floor(Math.random()*(Img.length-1));
              document.getElementById("output").innerHTML='<img
src="'+Img[number]+'" alt="Error">';
          }
          function numGen(){
              let number=Math.floor(Math.random()*10);
              document.getElementById("output1").innerHTML=number;
          }
        </script>
      </body>
    </html>
```

4. Write a java script to

a) sort the array element using bubble sort technique

Source-Code:

```
<html>
```

```
<head>
    <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>
    <input type="submit" value="Show Initial elements in the Array" onclick="disArr()"><br><br>
    <span id="arrayoutput" class="output"></span>
    <br><br><input type="submit" value="Show the Array after Bubble Sort" onclick="sortArr(arr)"><br><br>
    <span id="sortedarrayoutput" class="output"></span>
    <script>
        let arr=new Array(8,4,1,34,23,45,12,6);


        function disArr(){
            document.getElementById("arrayoutput").innerHTML="Elements before sorting are: ["+arr+"]";
        }


        function sortArr(arr) {
            var n = arr.length;
            for (var i = 0; i < n - 1; i++) {
            for (var j = 0; j < n - i - 1; j++) {
                if (arr[j] > arr[j + 1]) {
                var temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
                }
            }
            }
            document.getElementById("sortedarrayoutput").innerHTML="Array Elements after sorting are: ["+arr+"]";
        }
```

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

b) search a given element in the given set of given elements using binary search technique.

Source-Code:

```
<html>
  <head>
    <link rel="stylesheet" href="style.css">
  </head>
  <body>
    <input type="submit" value="Show Initial elements in the Array" onclick="disArr()"><br><br>
    <span id="arrayoutput" class="output"></span><br><br><br>
    <label for="num">Enter a number to search in the array:</label>
    <input type="number" id="num" ><br>
    <input type="submit" value="Search the number" onclick="numSearch()"><br><br>
    <span id="binsearchoutput" class="output"></span><br>
    <script>
      let a=new Array(0,1,2,3,4,5,6,7,8,9);

      function disArr(){
        document.getElementById("arrayoutput").innerHTML="Elements in the array are: ["+a+"]";
      }

      function binSearch(a,e){
        let low=0;
        let high=a.length-1;
        let mid;
```

```
            while(low<=high){
                mid=Math.floor((low+high)/2);
                if(e==a[mid]){
                    return mid;
                }else if(e<a[mid]){
                    high=mid-1;
                }else{
                    low=mid+1;
                }
            }
            return 0;
        }

        function numSearch(){
            let e=parseInt(document.getElementById("num").value);
            let i=binSearch(a,e);
            if(i==0){
                document.getElementById("binsearchoutput").innerHTML="Number not found in the array";
            }
            else{
                document.getElementById("binsearchoutput").innerHTML="Number is found at the index:"+i;
            }
        }
    </script>
  </body>
</html>
```

c) compute i) addition of two matrices ii) multiplication of two matrices

Source-Code:

```
<html>
   <head>
      <link rel="stylesheet"  href="style.css">
      <style>
         .container {
            display: flex;
            justify-content: space-around;
         }
      </style>
   </head>
   <body>
         <div class="container">
            <div class="left">
               <button onclick="showMatri()">Show the Matrices</button><br>
               <table id="output1" class="output"></table><br>
               <table id="output2" class="output"></table>
            </div>

            <div class="middle">
               <button onclick="addMatri(m1,m2)"> Click to ADD the
Matrices</button>
               <table id="addout" class="output"></table>
            </div>

            <div class="right">
               <button onclick="mulMatri(m1,m2)"> Click to Multiply the
Matrices</button>
               <table id="mulout" class="output" ></table>
            </div>
         </div>
      <script>
```

```
let m1=[
   [1,2,3],
   [4,5,6],
   [7,8,9]
]
let m2=[
   [1,0,0],
   [0,1,0],
   [0,0,1]
]

function printMatri(a){
   let output="";
   for(i=0;i<a.length;i++){
      output+="<tr>";
         for(j=0;j<a.length;j++){
            output+="<td>"+a[i][j]+"</td>";
         }
      output+="</tr>";
   }
   return output;
}

function showMatri(){
   let matrix1=printMatri(m1);
   let matrix2=printMatri(m2);
   document.getElementById("output1").innerHTML=matrix1;
   document.getElementById("output2").innerHTML=matrix2;
}
```

```
        function addMatri(a,b){
            let c=[];
            for(i=0;i<a.length;i++){
                let str=[];
                for(j=0;j<a.length;j++){
                    str.push(a[i][j]+b[i][j]);
                }
                c.push(str);
            }
            let ao=printMatri(c);
            document.getElementById("addout").innerHTML=ao;
        }

        function mulMatri(a,b){
            let c=[];
            for(i=0;i<a.length;i++){
                let str=[];
                for(j=0;j<a.length;j++){
                    str.push(a[i][j]*b[j][i]);
                }
                c.push(str);
            }
            let mo=printMatri(c);
            document.getElementById("mulout").innerHTML=mo;
        }

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

5. Write a java script to

a) implement string operations using String object

Source-Code:

```
<html>
   <head>
      <title>string object</title>
      <link rel="stylesheet" href="style.css">
      <style>
         div
         {
            background-color: #1C1C1C;
            border: 3px solid #D4D4D2;
            width: max-content;
            height: max-content;
            padding: 25px;
            text-align: left;
         }
         #StringOutput{
            color:#fff;
         }
      </style>
   </head>
   <body>
      <center>
         <div>
            <span>
               <center>
                  <u class="output">String Object</u><br><br>
               </center>
            </span>
```

```
                <br>
                <span id="StringOutput" ></span>
            </div>
        </center>
        <script>

            let Output = document.getElementById("StringOutput");

            let str = new String("Hello, My Name is Shreyas.");

            Output.innerHTML = "<u>Original String:</u> " + str +
"<br><br><br><u>String Operations:<u><br>";

            Output.innerHTML += "<br>1. String Length: " + str.length + "<br>";
            Output.innerHTML += "<br>2. Character at index 18: " + str.charAt(18)
+ "<br>";
            Output.innerHTML += "<br>3. Substring from index 0 to 4: " +
str.substring(0, 5) + "<br>";

            let newStr = str.concat("I am a CS Under Grad");
            Output.innerHTML += "<br>4. Concatenated string: " + newStr +
"<br>";

            Output.innerHTML += "<br>5. Uppercase: " + str.toUpperCase() +
"<br>";
            Output.innerHTML += "<br>6. Lowercase: " + str.toLowerCase() +
"<br>";

            Output.innerHTML += "<br>7. Starts with 'Hello': " +
str.startsWith("Hello") + "<br>";
            Output.innerHTML += "<br>8. Ends with 'Tayyab.': " +
str.endsWith("Tayyab.") + "<br>";
```

```
            Output.innerHTML += "<br>9. Index of 'Tayyab': " +
str.indexOf("Tayyab") + "<br>";


            let replacedStr = str.replace("Hello", "Hi");
            Output.innerHTML += "<br>10. Replaced string: " + replacedStr +
"<br>";


            let splitStr = str.split(",");
            Output.innerHTML += "<br>11. Split string: " + splitStr + "<br>";
        </script>
    </body>
</html>
```

b) implement the mathematical operations using Math object

Source-Code:

```
<html>
    <head>
        <title>Math Object</title>
        <link rel="stylesheet" href="style.css">
        <style>
            div
            {
                background-color: #1C1C1C;
                border: 3px solid #D4D4D2;
                width: max-content;
                height: max-content;
                padding: 25px;
                text-align: left;
            }
            #MathOutput{
                color:#fff;
```

```
            }
        </style>
    </head>
    <body>
        <center>
            <div>
                <span>
                    <center>
                        <u  class="output">Math Object</u>
                    </center>
                </span>
                <br>
                <span id="MathOutput"></span>
            </div>
        </center>
        <script>
            let Output = document.getElementById("MathOutput");

            Output.innerHTML = "<u>Math Properties:</u><br>";
            Output.innerHTML += "1. Pi Value: " + Math.PI + "<br>";
            Output.innerHTML += "2. Eulers Number(E): " + Math.E + "<br>";
            Output.innerHTML += "3. Natural Logarithm of 2: " + Math.LN2 +
"<br>";
            Output.innerHTML += "4. Natural Logarithm of 10: " + Math.LN10 +
"<br>";
            Output.innerHTML += "5. Base 2 Logarithm of e: " + Math.LOG2E +
"<br>";
            Output.innerHTML += "6. Base 10 Logarithm of e: " + Math.LOG10E +
"<br><br>";

            Output.innerHTML += "<u>Math Methods:</u><br>";
```

```
            Output.innerHTML += "1. Round off value of 3.454: " +
Math.round(3.454) + "<br>";
            Output.innerHTML += "2. Ceil of 4.3: " + Math.ceil(4.3) + "<br>";
            Output.innerHTML += "3. Floor of 4.3: " + Math.floor(4.3) + "<br>";
            Output.innerHTML += "4. Absolute value of -3.24: " + Math.abs(-3.24) +
"<br>";

            Output.innerHTML += "5. Maximum of (8,12,23): " + Math.max(8,12,23)
+ "<br>";
            Output.innerHTML += "6. Minimum of (8,12,23): " + Math.min(8,12,23)
+ "<br>";

            Output.innerHTML += "7. 2 to the power 3: " + Math.pow(2, 3) +
"<br>";
            Output.innerHTML += "8. Square root of 16: " + Math.sqrt(16) + "<br>";

            Output.innerHTML += "9. Sine of 30 degrees: " + Math.sin(Math.PI / 6) +
"<br>";
            Output.innerHTML += "10. Cosine of 60 degrees: " + Math.cos(Math.PI /
3) + "<br>";
            Output.innerHTML += "11. Tangent of 45 degrees: " + Math.tan(Math.PI /
4) + "<br>";

            Output.innerHTML += "12. Random number between 0 and 1: " +
Math.random() + "<br>";
            Output.innerHTML += "13. Random integer from 1 and 10: " +
Math.floor(Math.random()*10 + 1) + "<br>";
        </script>
    </body>
</html>
```

c) display Greeting messages using Date object

Source-Code:

```
<html>
```

```
<head>
   <title>Date Object</title>
   <link rel="stylesheet" href="style.css">

</head>
<body>
   <center>
      <div class="output">
         <span id="output"></span>
         <br><br>
         <span id="curdate"></span>
      </div>
   </center>
</body>
<script>
   let d=new Date();
   let h=d.getHours();
   let m=d.getMinutes();
   let gm="Good Night";
   if(h<21){
      gm="Good Evening";
   }
   if(h<16){
      gm="Good AfterNoon";
   }
   if(h<12){
      gm="Good Morning";
   }
   document.getElementById("output").innerHTML=gm;
   document.getElementById("curdate").innerHTML="The Time is "+h+":"+m;
```

```
    </script>
</html>
```

6. Demonstrate event model

a) Form events(onchange, onfocus ,onblur)

Source-Code:

```
<html>
    <head>
        <title>Form Events</title>
        <link rel="stylesheet" href="style.css">
        <script>
            function mf(){
                let mn=document.getElementById("in").value;
                document.getElementById("oncout").innerHTML="Your Favorite Movie is: "+mn;
            }
            function chanColor(a){
                a.style.changeColor="black";
                a.style.background="#33FFBD";
            }
            function displayText(){
                document.getElementById("onbout").innerHTML="Your Cursor is out of input's bounds."
            }
        </script>
    </head>
    <body>
        <center>
            <label for="in">Enter your favorite movie:</label>
            <input type="text" id="in" onchange="mf()" onfocus="chanColor(this)" onblur="displayText()"><br><br>
```

```
        <span id="oncout" class="output"></span><br><br><br><br>
        <span id="onbout" class="output"></span>
      </center>
   </body>
</html>
```

b) Mouse events (onclick, onmouesedown, onmoueseup, onmouesemove, onmoueseover)

Source-Code:

```
<html>
   <head>
      <title>Mouse Events</title>
      <link rel="stylesheet" href="style.css">
      <script>
         function displayText(){
            document.getElementById("oncout").innerHTML="This Text is
displayed by using onclick event"
         }
         function cColor(a){
            a.style.changeColor="black";
            a.style.background="#33FFBD";
         }
         function chColor(b){
            b.style.changeColor="#33FFBD";
            b.style.background="black";
         }
      </script>
   </head>
   <body>
      <input type="submit" value="Click Here"
onclick="displayText()"><br><br>
```

```
        <span id="oncout" class="output"></span><br><br>
        <input type="submit" value="Click and hold to change Color"
onmousedown="cColor(this)" onmouseup="chColor(this)"><br>
        <input type="submit" value="Hover to change Color"
onmouseover="cColor(this)" onmousemove="chColor(this)">
    </body>
</html>
```

c) Event bubbling

Source-Code: