

## Javascript Programming

**Program 1:** Write a javascript with a loop that prints out 1-10.

**Solution:**

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript Loops</h2>

<p id="demo"></p>

<script>

var text = "";
var i;
for (i = 0; i < 10; i++)
    text += i+1 + "<br>";
document.getElementById("demo").innerHTML = text;
</script>

</body>
</html>
```

**Output:**

### Script Printing from 1 to 10

```
1
2
3
4
5
6
7
8
9
10
```

**Program 2:** Write a javascript with a loop that prints out 10-1.

**Solution:**

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript Loops</h2>

<p id="demo"></p>

<script>

var text = "";
var i;
for (i = 0; i < 10; i++)
    text += 10-i + "<br>";
document.getElementById("demo").innerHTML = text;
</script>
</body>
</html>
```

**Output:**

## Script Printing from 10 to 1

```
10
9
8
7
6
5
4
3
2
1
```

**Program 3:** Write a javascript that generates a new Date object (remember date objects?), and gets the minutes, seconds, and milliseconds and prints it out. It then runs a loop that prints numbers 1-10000 to the screen. And then it generates another new Date object and gets the current minutes, seconds, and milliseconds and prints it out. How long did the loop take?

**Solution:**

```
<!DOCTYPE html>
<html>
<body>
<h2>JavaScript new Date()</h2>

<p id="demo"></p>

<script>
    var d = new Date();
    document.write(d + "<br>");
    //document.getElementById("demo").innerHTML = d;

    var text = "";
    var i;
    for (i = 0; i < 1000 ; i++)
        text += i+1 + "<br>";
    document.write(text)
    //document.getElementById("demo").innerHTML = text;

    var d2 = new Date();
    document.write(d2 + "<br>");
    //document.getElementById("demo").innerHTML = d2;

    d2 -= d;
    document.write(d2);
    //document.getElementById("demo").innerHTML = d2;
</script>
</body>
</html>
```

**Output:**

## Using Date Object

```
Date is Mon Apr 01 2019 08:23:36 GMT+0530 (India Standard Time)
8 hours 23 minutes 36 seconds 186 milliseconds
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74
92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113
125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143
156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174
```

```
.....
9971 9972 9973 9974 9975 9976 9977 9978 9979 9980 9981 9982 9983
9995 9996 9997 9998 9999 10000
Date is Mon Apr 01 2019 08:23:36 GMT+0530 (India Standard Time)
8 hours 23 minutes 36 seconds 209 milliseconds
Difference in time is 23 milliseconds
```

**Program 4:** Repeat 3, only this time instead of printing out all the numbers from 1-10000, add them together and print out the total. How long did this take? Are computers more efficient at printing to the screen or adding numbers together?

### Solution:

```
<html>
<body>
<script>
    var d = new Date();
    s = d.getSeconds();
    m = d.getMinutes();
    ml = d.getMilliseconds();

    document.write(d + "<br>" + m + ":" + s + ":" + ml + "<br>");
    var text = "";
    var i;
    var sum = 0;
    for (i = 1; i <= 1000 ; i++)
        sum += i;
    document.write("Total sum: " + sum + "<br>")

    var d2 = new Date();
    s2 = d2.getSeconds();
    m2 = d2.getMinutes();
    ml2 = d2.getMilliseconds();
    document.write(d2 + "<br>" + m2 + ":" + s2 + ":" + ml2 + "<br>");
```

```
diff = ml2 - ml;  
document.write("Time difference: " + diff + "ms");  
</script>  
  
</body>  
</html>
```

## Output:

### Using Date Object

```
Date is Mon Apr 01 2019 08:23:45 GMT+0530 (India Standard Time)  
8 hours 23 minutes 45 seconds 271 milliseconds  
50005000  
Date is Mon Apr 01 2019 08:23:45 GMT+0530 (India Standard Time)  
8 hours 23 minutes 45 seconds 273 milliseconds  
Difference in time is 2 milliseconds
```

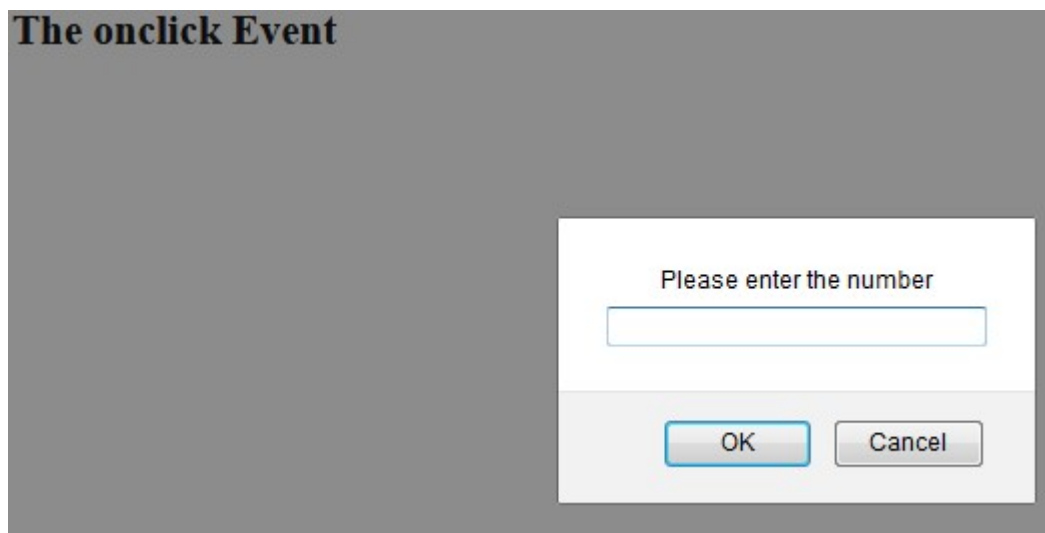
**Program 5:** Write a javascript that asks the user to input a number. The number is then passed into a function you write that contains a loop. The loop will loop the number you passed into the function and print out the word “ha” that many times. For instance, if I entered 3, the function would print out “ha haha”.

## Solution:

```
<html>  
  <body>  
    <script>  
  
      n = prompt("Enter Number : ")  
  
      function ha(n)  
      {  
        var i;  
        for (i = 0; i < n; i++)  
          document.write("ha" + "<br>");  
      }  
  
      ha(n);
```

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

## Output:



ha  
ha  
ha

**Program 6:** Write a javascript that asks the user to input a number. The number is then passed to a function. The function contains a loop that loops the number you've passed in (e.g., if the user entered 4, you loop 4 times). Each time you multiply the number by itself. When you are done, return the new number you calculated to the main program and print it out. (e.g., if you entered

## Solution:

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

      n = prompt("Enter Number : ")

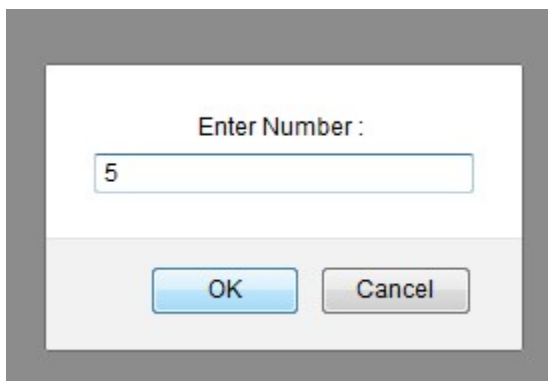
      function mul(n)
      {
        var result = 1;
        var i;
        for (i = 0; i < n; i++)
        {
          result *= i;
        }
        return result;
      }

      document.write(mul(n));

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

## Output:

3, you'd multiply 3x3x3, which would give you 27. 27 is the number you'd return to the main javascript.



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**Program 7:** Write an html page that contains a button that, when you click on it, it displays a date and time in an alert box. The date and time should be displays as follows: Sunday, April 9, 3:27:3 pm. A couple of notes on this one: the body of your html page should look like this:

```
<body>
<input type = "button" value = "Click here to display date" OnClick =
"NameOfFunctionYouWroteToDisplayTheDate()">
</body>
```

Where “NameOfFunctionYouWroteToDisplayTheDate()” will be replaced with the shorter name you gave to the function you will write to display the date. And the output should look like this:

Hint: to convert the month and the day from numbers to strings, you will use 2 long if...else if statements. For example, if the variable currdays holds a number from 0-6 representing the day of the week, you might have something saying if the currdays is 0, the currdaysstring is “Sunday”, etc.

## Solution:

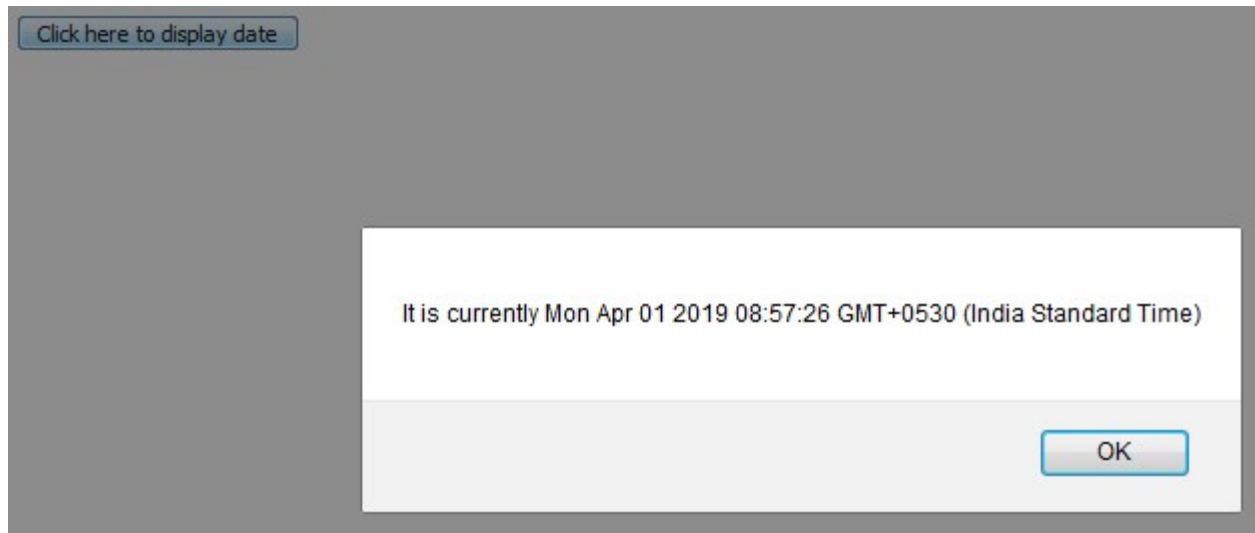
```
<html>
  <body>
    <button onclick = "action()">Click here to display date</button>
    <script>

      function action()
      {
        d = new Date();
        window.alert("It is currently " + d);
      }

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

## Output:





**Program 8:** The following code displays one of 5 random pictures whenever you click on the button in your html code (with the picture names being kit1.jpg, kit2.jpg, kit3.jpg, kit4.jpg, and kit5.jpg):

```
<html>
<head>
<script type = "text/javascript">
function ChangePic(imagename){
picnum = Math.floor(Math.random() * 5) + 1;
newpicname = "kit"+picnum+".jpg";
document.images[imagename].src = newpicname;
}
</script>
</head>
<body>

<input type = "button" value = "Click here to change pic" OnClick =
"ChangePic('kitpic')">
</body>
</html>
```

To understand this code, let's first start with the image in the body. It has a unique name and id (we use both name and id because one is used by Firefox and the other is used by IE). The name and id must be the same, and for each image, the name (and id) must be unique. This is how we identify the image whose source we'll change later. To start our code, we have a button in the body of our html code. When we click on it (OnClick), we call the function ChangePic(). We are

calling the function with the name (or id) of the image whose source we want to change. Now look at the function. We've passed in the name (or id) of the image we want to change, and that ends up in the variable named `imagename`. Next we want to generate a random number between 1 and 5 (because I had 5 different kitten pics I wanted to display). So first note that we're generating a random number using `Math.random()` function. This function generates a random number between 0 and 1. So the function will give us something like 0.3. If we want to generate a random number between 1-5, we can multiply the result returned from `Math.random()` by 5. This will give us something like 1.5. Well, that's okay, but we really want integers, like 1, 2, 3, etc. So we run a function that returns the "floor" (it rounds down, or chops off everything after the decimal point). So if we run `Math.floor(1.5)`, we'll get 1. We need to do one more thing to get our random number. If `Math.floor` rounds down, we could end up with 0 (e.g., rounding down 0.5), and we'll never get 5 (the original random number generator generated a random number BETWEEN 0 and 1, so neither 0 nor 1 are ever generated. If 1 is never generated by the `Math.random` function, 5 is never generated when we multiply by 5. So to get a final number between 1 and 5 instead of between 0 and 4, we must add one. We've now generated a random number. We'll use this in the name of our new image source. The new picture image's name will be "kit"+ `picnum` + ".jpg", with `picnum` being the random number we just generated. For instance, if the random number was 3, the new image's name will be `kit3.jpg`. We now want to change what picture is displayed in the body of our html code. Our whole entire html code is what javascript considers to be our document object. The document object has subobjects. One is all the images on the page. We want a specific image, identified by its name (or id), and that is the string we passed into the function. So `document.images[imagename]` refers to the specific image "kitpic" in the `document.images` objects. To change its source (which starts out being "kit1.jpg" –we specified it in the image named "kitpic" in the body), we give the `.src` a new picture

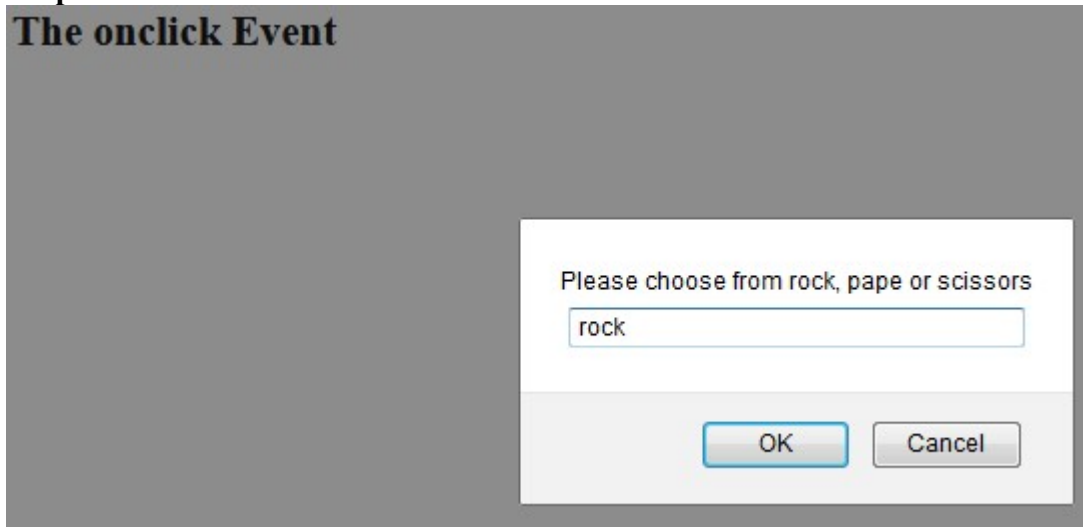
to display. `document.images[imagename].src = newpicname` takes the string inside the variable `newpicname` and makes it the new source for the image named "kitpic" in the body of the html code. Knowing all this (I'd first take this code and plop it in a text file to get a feel for how it works), your assignment is to create a game of Rock, Paper, Scissors. First you'll need to find a picture of a rock, a pic of paper, and a pic of scissors. Make sure they're all the same size, and make sure they're all of type .jpg. Name them `img1.jpg`, `img2.jpg`, and `img3.jpg`. You will create a loop that loops 3 times. Each time, you will prompt for the user to select "rock", "paper", or "scissors". You'll then translate rock to 1, paper to 2, and scissors to 3. The computer will then choose rock, paper, or scissors by generating a random number between 1 and 3. At this point, you will display the appropriate picture of rock, paper, or scissors for your choice, and a separate image (perhaps next to the first) that shows the computer's choice of rock, paper, or scissors. We should be able to see both images simultaneously, so you will need 2 images in your body, each with its own unique name (and id). You should generate an appropriate message saying whether you or the computer won (or whether it's a tie). This should happen for 3 loops. At the end of 3 loops, your program should report how many times you won and how many times the computer won.

## Solution:

```
<html>
  <head>
    <script type = "text/javascript">
      function ChangePic(imagename)
      {
        picnum = Math.floor(Math.random() * 5) + 1;
        newpicname = "kit"+picnum+".jpg";
        document.images[imagename].src = newpicname;
      }
    </script>
  </head>
  <body>
    
    <button onclick = "ChangePic('kitpic')">Click here to change pic</button>
  </body>
</html>
```

## Output:

### The onclick Event





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## The onclick Event

Play



## The onclick Event



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Play



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