Web Basics - JavaScript

Lab Book

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Getting Started

Overview

These Lab book is a guided tour for Learning JavaScript. It contains solved examples and To Do assignments. Follow the steps provided in the solved examples and then work out the 'to do' Assignments given.

Setup Checklist for JavaScript

Here is what is expected on your machine in order for the lab to work.

Minimum System Requirements

- Hardware: Networked PCs with minimum 64 MB RAM and 60 MB HDD.
- Software: Window based Operating System having the latest version of Internet Explorer (IE) or Netscape Navigator installed.

Please ensure that the following is done:

- A text editor like Notepad, Eclipse Luna or Visual Studio 2008 is installed.

Instructions

- For coding standards refer Appendix – A.
- All Lab assignments should follow the coding standards.
- Create a directory by your name in drive <drive> for JavaScript assignments.
- In this directory, create subdirectory javascript_assgn.
- For each lab create directory as lab<lab number>.

Learning More (Bibliography if applicable)

- Beginning JavaScript by Paul Wilton
- JavaScript: The Definitive Guide by David Flanagan
- JavaScript Application Cookbook by Jerry Bradenbaugh

Lab 1:Basics Concepts of JavaScript

Goals	• Learn to embed script tags in different parts of the HTML document.
Time	120 minutes

1.1: Create a page to display “Welcome to JavaScript”.

Solution:

Step 1: Complete the following code and save it as prob1.html

```
<!DOCTYPE html>
<html>
<head>
<title> Welcome to JavaScript</title>
</head>
<body>
<script>
 document.write("Welcome to JavaScript - The Scripting Language")
</script>
</body>
</html>
```

Example 1: Lab 1: Prob1.html

Step 2: Start the editor to be used.

Step 3: Write the JavaScript program.

Step 4: Save the file with extension .html or htm.

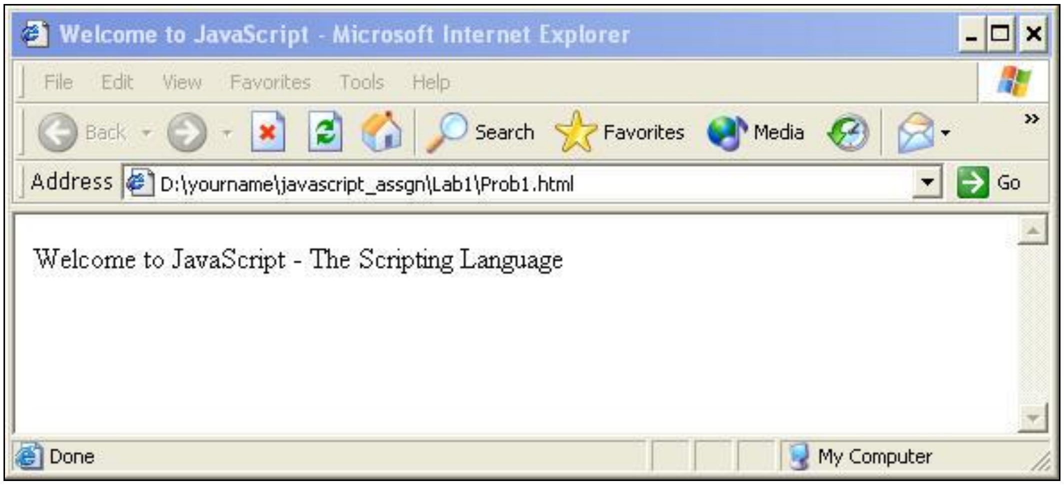
Step 5: Select **Start → Programs → Internet Explorer.**

Alternatively select **Start → Programs → Netscape Navigator.**

Step 6: In the Internet Explorer, select **File → Open → Browse**, and select the file you have just saved.

Step 7: Click **OK** in the browser pop-up window.

Step 8: Verify that you get the output as shown in the figure given below.



Welcome to JavaScript - Microsoft Internet Explorer

Address D:\yourname\javascript_assgn\Lab1\Prob1.html

Welcome to JavaScript - The Scripting Language

Figure 1: Welcome to JavaScript

Note: Follow the above steps (3 - 8) for every Lab problem for verifying the output. You can also use other text editors like editplus, WordPad, MS Visual Interdev (if installed) to create your **html** and **.js** pages.

1.2: Create prob2.html to display Formatted Hello World by using JavaScript by embedding Hello World in <H1> tag.

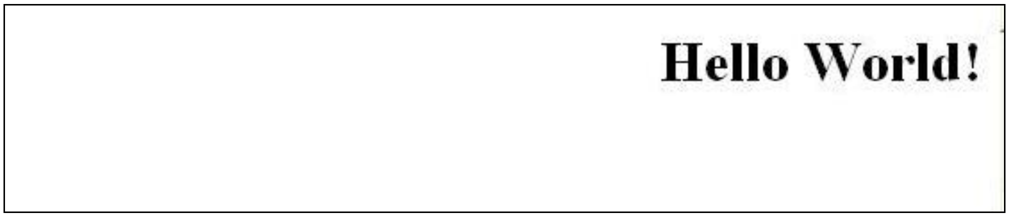
Solution:

Step 1: Create **prob2.html** page to complete the following code and save in lab1 directory.

```
<html>
<head>
<title>Displaying Formatted Text using JavaScript</title>
</head>
<body>

<script>

//TODO:  Display hello world embedded in h1 tag with align attribute value right

</script>

</body>
</html>
```

Example 2: Lab 1: Prob2.html

Step 2: Open **prob2.html** page in the browser, and verify that you get the same output as required.



Hello World!

Figure 2: Formatting Text in JavaScript

1.3: Create page to show use of external JavaScript

Solution:

Step 1: Create **Prob3.html** to complete the following code and save it in lab1 directory.

```
<html>
<head><title>Using External Script file in HTML Document</title>

<script src="HelloWorld.js">
</script>

</head>
<body>
<hr>
<p>The actual script is in external script file called "HelloWorld.js"</p>


<script>
//TODO: Insert the code here to invoke the function sayHello() in the file HelloWorld.js
</script>

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

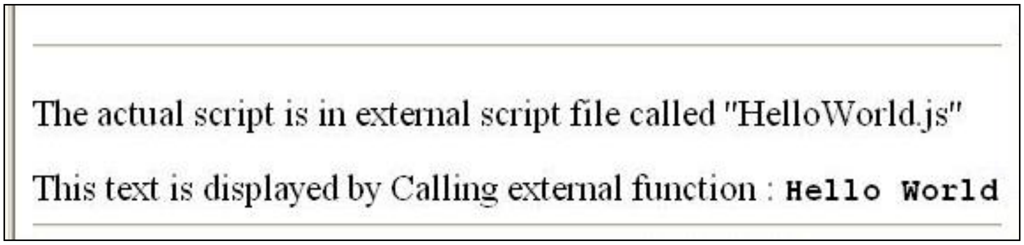
Example 3: Lab 1: Prob3.html

Step 2: Create a file **HelloWorld.js** which should have a function **sayHello()** that returns a string “Hello World”.

```
function sayHello()
{
//TODO:return the string “Hello World“
}
```

Example 4: Lab 1: HelloWorld.js

Step 3: Open **prob3.html** page in the browser, and verify that you get the same output as required.



The actual script is in external script file called "HelloWorld.js"

This text is displayed by Calling external function : `Hello World`

Figure 3: Using external JavaScript File

Step 4: Create **Prob4.html** page and complete the following code and save it in lab1 directory.

```
<html>
<head><title>Embedding Script tag in HTML Document</title>

<script>

//TODO:use write method in document object to display the desired output

</script>
<hr>
<script src="Hello.js">
</script>

</head>
<body>

<script>
//TODO:  use write method in document object to display desired the output
</script>

<hr>

<p><code>The actual script is in external script file called "Hello.js"</code></p>
```

```
<script>
//TODO:  Insert your code here to call the function dispHello() from the Hello.js file
</script>

<hr>

</body>
</html>
```

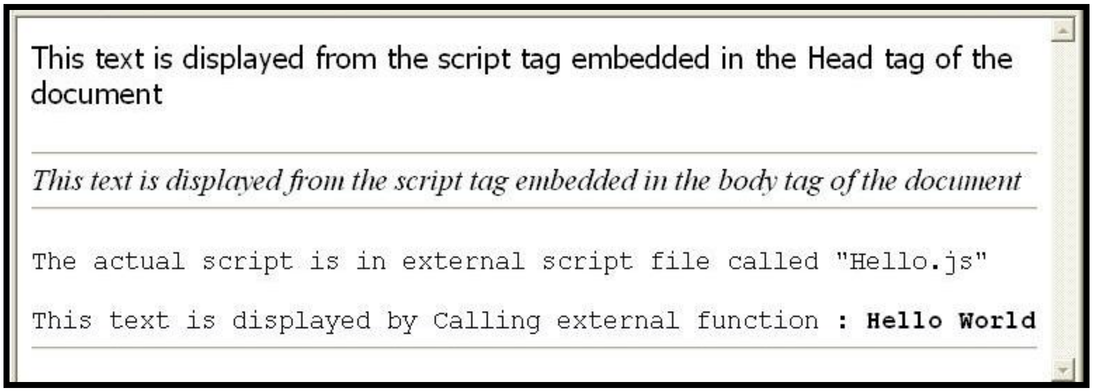
Figure 4: Lab 1: Prob4.html

Step 5: Create a file **Hello.js** which should have a function **dispHello()** that returns a string "Hello World".

```
function dispHello()
{
//TODO:return the string "Hello World"
}
```

Example 5: Lab 1: Hello.js

Step 6: Open **prob4.html** page in the browser, and verify that you get the same output as required.



This text is displayed from the script tag embedded in the Head tag of the document

This text is displayed from the script tag embedded in the body tag of the document

```
The actual script is in external script file called "Hello.js"

This text is displayed by Calling external function : Hello World
```

Figure 5: Embedding Script tags in HTML document

1.4: Using Variable in many Script tags

Solution:

Step 1: Create **Prob5.html** page, and complete the following code and save it in lab1 directory.

```
<html>
<head><title>Embedding Script tag in HTML Document</title>

<script>
/*
TODO:define variable headVar and initialize it to some integer value and display the value as
shown in the Fig 6
*/
</script>

<hr>
</head>
<body>

<script>
/*
TODO:define variable bodyVar and initialize it to some integer value and display the value as
shown in the Fig 6
*/
</script>

<hr>
<script src="common.js">
</script>

<script>
/*
TODO:  Invoke the method addNos(headVar,bodyVar)  defined in common.js file and pass the
two variables headVar and bodyVar defined in the head and the body script tag and display the
added result as shown in the Fig 6
*/
</script>

<hr>
```

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

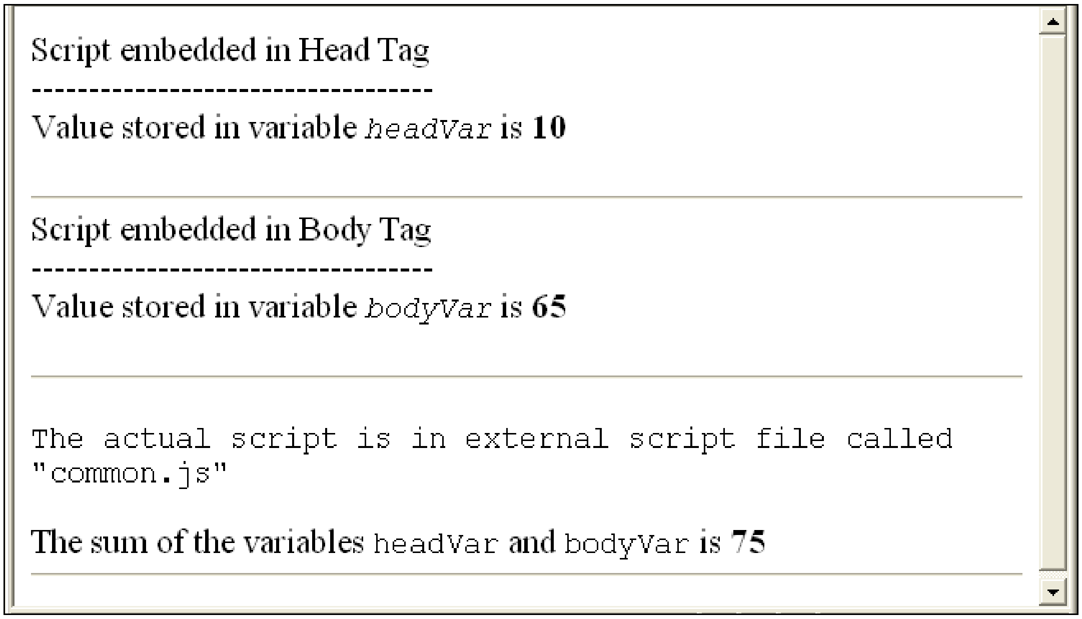
Example 6: Lab 1: Prob5.html

Step 2: Create a file **common.js** which has a function **addNos()** that adds two numbers and returns the addition of two numbers.

```
var msg;
msg="<p><code>The actual script is in external script file called common.js</code></p>";

function addNos(headVar,bodyVar)
{

//TODO: display the contents of the variable "msg"

//TODO: display the addition of two numbers


}
```

Example 7: Lab 1: common.js

Step 3: Open prob5.html page in the browser, and verify that you get the same output as required.



Script embedded in Head Tag

Value stored in variable *headVar* is **10**

Script embedded in Body Tag

Value stored in variable *bodyVar* is **65**

```
The actual script is in external script file called
"common.js"
```

The sum of the variables `headVar` and `bodyVar` is **75**

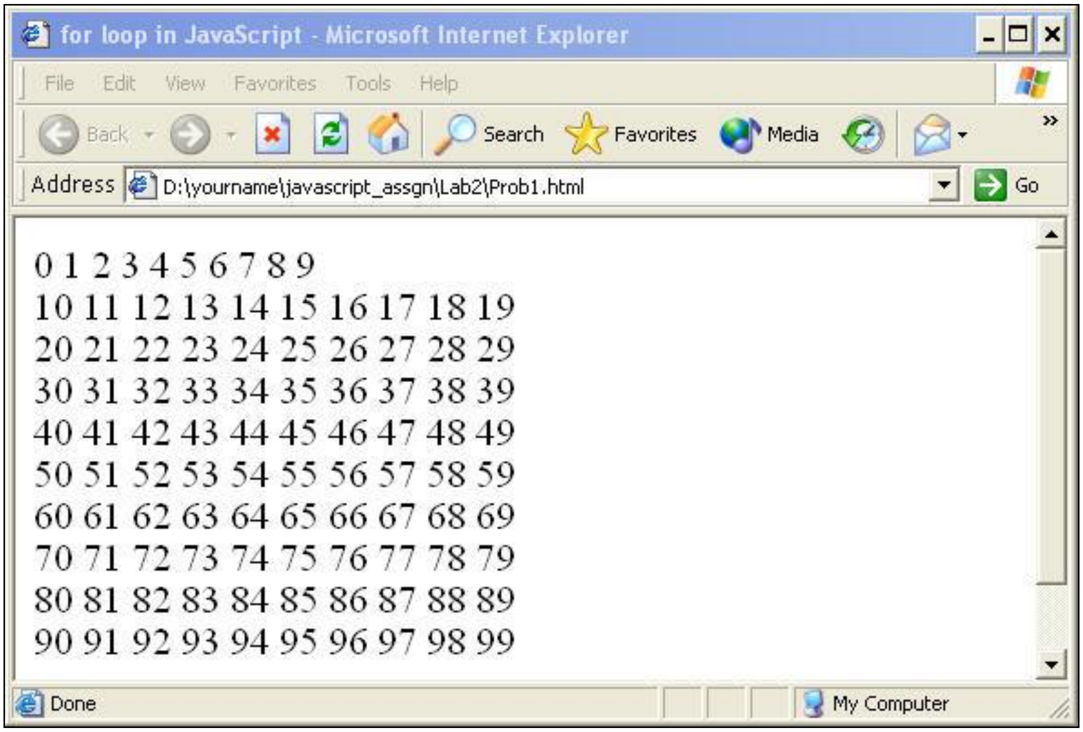
Figure 6: Using Variable in many Script tags

Lab 2:The JavaScript Language

Goals	- Learn to use looping structures and operators in JavaScript.
Time	20 minutes

2.1: For loop in JavaScript

Create a web page containing a heading “Layout is here” followed by a horizontal rule and a table with a single row as shown in the figure given below.


for loop in JavaScript - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
Back
Search
Favorites
Media
Address
D:\yourname\javascript_assgn\Lab2\Prob1.html
Go
Done
My Computer

```
0 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 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 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 75 76 77 78 79
80 81 82 83 84 85 86 87 88 89
90 91 92 93 94 95 96 97 98 99
```

Figure 7: For loop in JavaScript

After completing the loop, the variable used, that is **“I”**, should be equal to **100**.

Solution:

Step 1: Write the code and save it as **Prob1.html** in lab2 directory.

Step 2: Open **prob1.html** page in the browser, and verify that you get the same output as required.

Step 3: Create **prob1_dowhile.html** and **prob1_whiledo.html** page using **do…while** and **while…do** control statements respectively to display similar output as shown in the figure given above.

2.2: Create a web page to calculate the Compound Interest using the formula given below:

Compund Interest $\left[P * \left(1 + \frac{r}{100}\right)^{n} \right] - P$

Where:

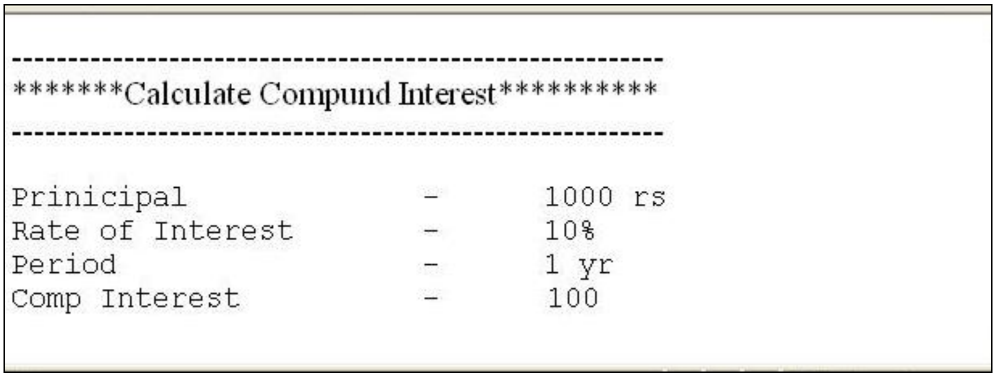
p = Principal,

r = Rate of Interest,

n = period in years

The values used in the example in the following figure are as follows:

P = 1000, n = 1, r = 10



```
-----------------------------------------------------------
*******Calculate Compund Interest**********
-----------------------------------------------------------

Prinicipal            -      1000 rs
Rate of Interest      -      10%
Period                -      1 yr
Comp Interest         -      100
```

Figure 8: Operators and Arithmetic Expression

Solution:

Step 1: Write the code, and save it in lab2 directory.

Step 2: Open page in the browser, and verify that you get the same output as required.

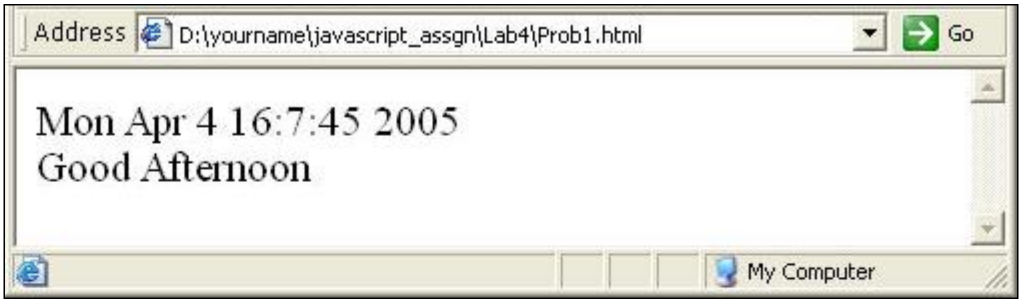
Lab 3:Working with Predefined core objects

Goals	Understand Date, String Object Learn to use Date and String objects in HTML pages
Time	45 minutes

3.1: Displaying Date using Date Object

Create a web page **Prob1.html**. In this web page, create a **date** object and use the **getXXXX** functions of the date object to display today's date in the format as shown below in the figure and also greet the user depending on the time the user visits the page. The message to be displayed is given in the following table. The time column shows the current date hour value.

Time	Msg to be displayed
< 12	Good Morning
>= 12 and <= 17	Good Afternoon
> 17	Good Evening



Mon Apr 4 16:7:45 2005
Good Afternoon

Figure 9: Displaying Date using Date Object

Solution:

Step 1: Write the Code, and save it as Prob1.html in lab4 directory.

Step 2: Open prob1.html page in the browser, and verify that you get the same output as required.

3.2: Using indexOf function of String object

Create a web page **prob2.html**, which uses the **indexOf** method of string object and displays the index number of the substring searched for within the string.

Missing Fig.

Figure 10: Using indexOf method of String object

Solution:

Step 1: Write the Code and save it as **Prob2.html**.

Step 2: Open **prob2.html** page in the browser, and verify that you get the same output as required.

3.3: Using various String methods

Write **prob3.html** page by completing the following code that demonstrates some of the methods of the String objects like match, **substr**, **lowerCase**, and **upperCase** to produce the output as shown in the figure given below:

Missing Fig.

Figure 11: Using various String methods

Solution:

Step 1: Write the Code and save it as **Prob3.html**.

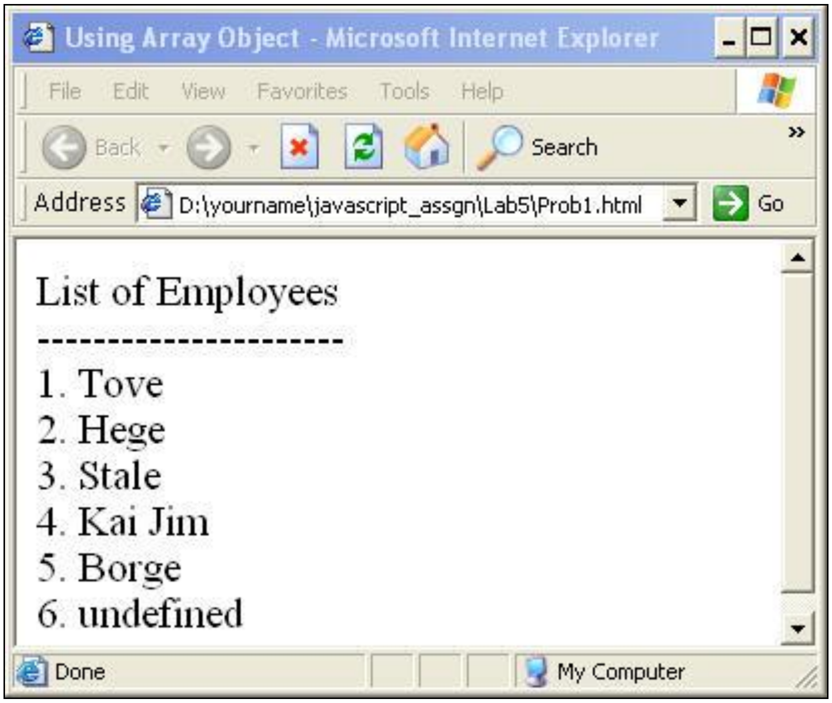
Step 2: Open **prob3.html** page in the browser, and verify that you get the same output as required.

Lab 4:Working with Arrays

Goals	Work with Array Object
Time	10 minutes

4 .1: Using Array to display values

Create a **prob1.html** web page containing script. In this script, declare an array of 6 employee names and display it in the browser as shown below:


Using Array Object - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Address
D:\yourname\javascript_assgn\Lab5\Prob1.html
Go
Done
My Computer

```
List of Employees
-----------------------
1. Tove
2. Hege
3. Stale
4. Kai Jim
5. Borge
6. undefined
```

Figure 12: Using Array to display values

Solution:

Step 1: Write the Code, and save it as **Prob1.html**.

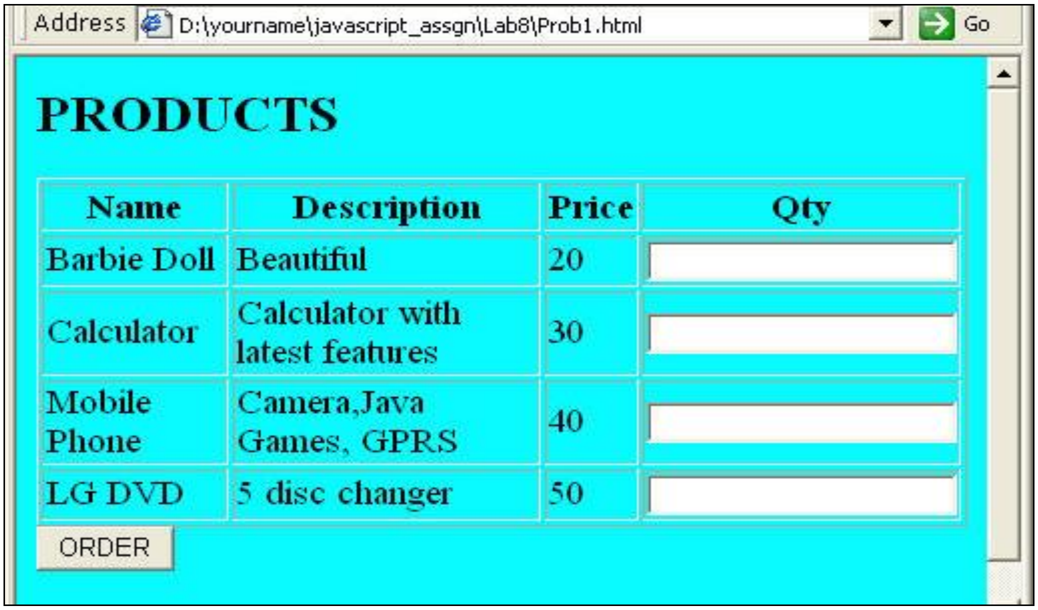
Step 2: Open **prob1.html** page in the browser, and verify that you get the same output as required.

Lab 5:Working with Document Object

Goals	Understand Document Object
Time	120 minutes

6.1: Working with Documents

Create a **prob1.html** web page which displays products available as shown in the following figure. The product details comprise Product Name, Product description, and its price.

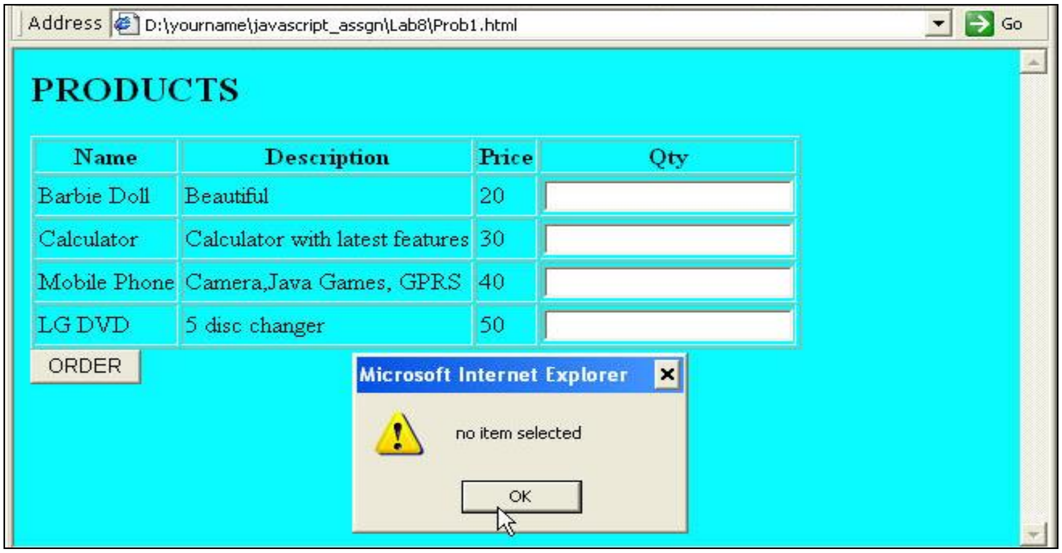


PRODUCTS

Name	Description	Price	Qty
Barbie Doll	Beautiful	20	
Calculator	Calculator with latest features	30	
Mobile Phone	Camera,Java Games, GPRS	40	
LG DVD	5 disc changer	50	

Figure 13: Displaying Products

Users can place orders specifying the quantity of each product. If the user does not enter quantity in any of the text fields, then an error message should be displayed as shown in the figure given below:



D:\yourname\javascript_assgn\Lab8\Prob1.html

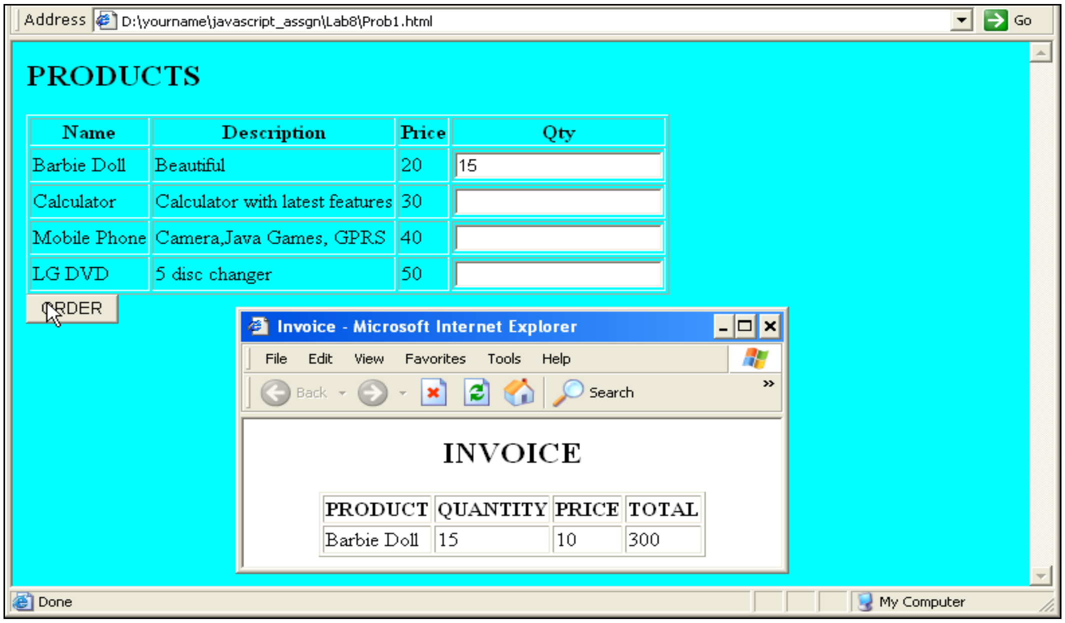
PRODUCTS

Name	Description	Price	Qty
Barbie Doll	Beautiful	20	
Calculator	Calculator with latest features	30	
Mobile Phone	Camera,Java Games, GPRS	40	
LG DVD	5 disc changer	50	

no item selected

Figure 14: Validating Products

When the user clicks the **Order** button, the invoice for the current products transaction showing the product name, quantity ordered, price and total amount is displayed in a new window as shown in the figure given below:



D:\yourname\javascript_assgn\Lab8\Prob1.html

PRODUCTS

Name	Description	Price	Qty
Barbie Doll	Beautiful	20	15
Calculator	Calculator with latest features	30	
Mobile Phone	Camera,Java Games, GPRS	40	
LG DVD	5 disc changer	50	

INVOICE

PRODUCT	QUANTITY	PRICE	TOTAL
Barbie Doll	15	10	300

Figure 15: Displaying Invoice details in a new window

Solution:

Step 1: Write the code and save it as **Prob1.html**.

Step 2: Open **prob1.html** page in the browser, and verify that you get the same output as required.

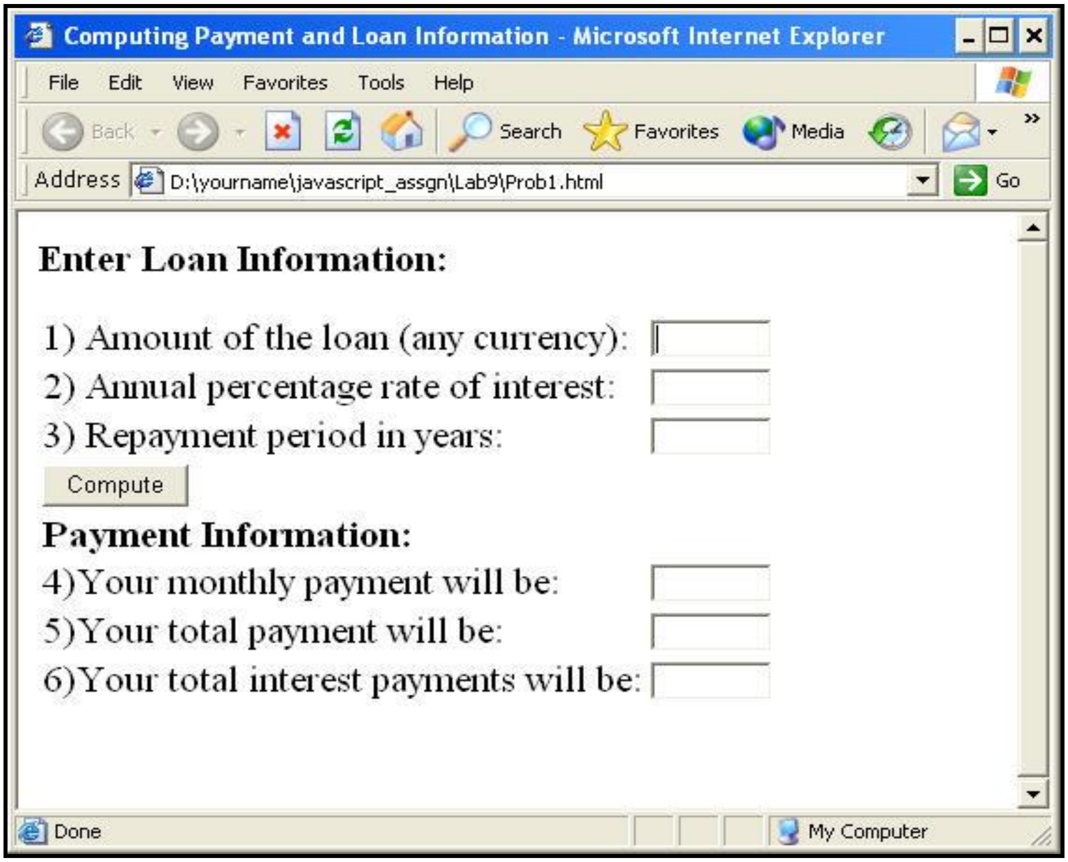
Lab 6:Working with Form Object

Goals	• Understand and use Form Object.
Time	90 minutes

8.1: Form Validation

Create a **prob1.html** web page, as shown below, and calculate **Payment Information** based on **Loan Information**. Validate **Loan information** textfields for numbers. The **Payment Information** textfields should be uneditable. The other constraints are as follows:

- Amount of Loan should not be more than 15 lakhs.
- Repayment period should be between 7 yrs to 15 yrs.


Computing Payment and Loan Information - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
Back
Search
Favorites
Media
Address
D:\yourname\javascript_assgn\Lab9\Prob1.html
Go
Compute
Done
My Computer

Enter Loan Information:

1) Amount of the loan (any currency):

2) Annual percentage rate of interest:

3) Repayment period in years:

Payment Information:

4)Your monthly payment will be:

5)Your total payment will be:

6)Your total interest payments will be:

Figure 16: Validating Form elements

If the repayment period is not between 7 and 15, then an error message should be displayed next to this control.

Similar kind of error message should be displayed if the amount of loan exceeds 15 lakh.

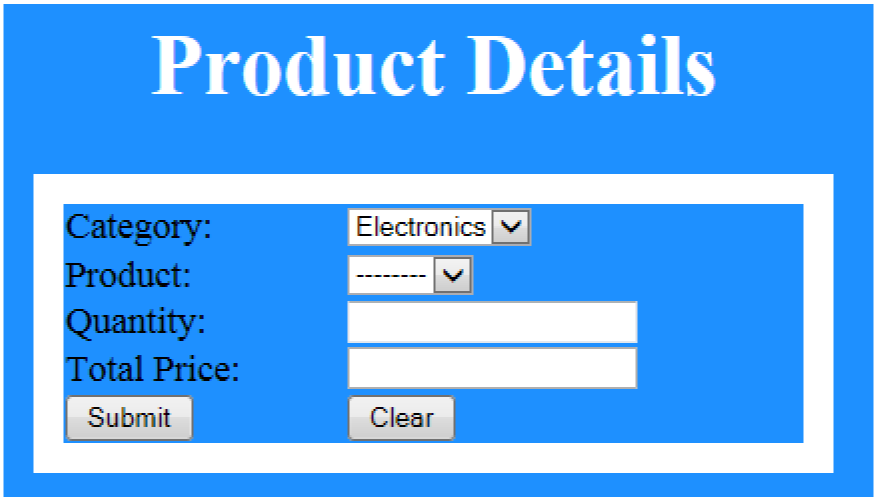
```
In the function calculatePayment()
/*
TODO:
calculate the monthly payment, total payment, total interest payment on click of the button with
label "compute"
*/
```

Example 8: Lab 8: Prob1.html

Open **prob1.html** page in the browser, and verify that you get the same output as required.

8.2 Validate Field

Create a **prob2.html** page as shown in the below figure.



Product Details

Category: Electronics

Product: --------

Quantity:

Total Price:

Figure 20: Lab 8.2 Product Details

Data should be prepopulated in category list box (Electronics, Grocery). Based on selection of category, product list need to be populated automatically with values as given in the below table. Also Total price need to be calculated for the entered quantity as per the data in the below table. Total price field should be non-editable field.

Category	Product	Price per quantity in Rupees
Electronics	Television	20000
	Laptop	30000
	Phone	10000
Grocery	Soap	40
	Powder	90

While clicking on submit button, if all the text fields contains valid values then display the filled details in a popup window.