The Hong Kong Polytechnic University
Department of Electronic and Information Engineering

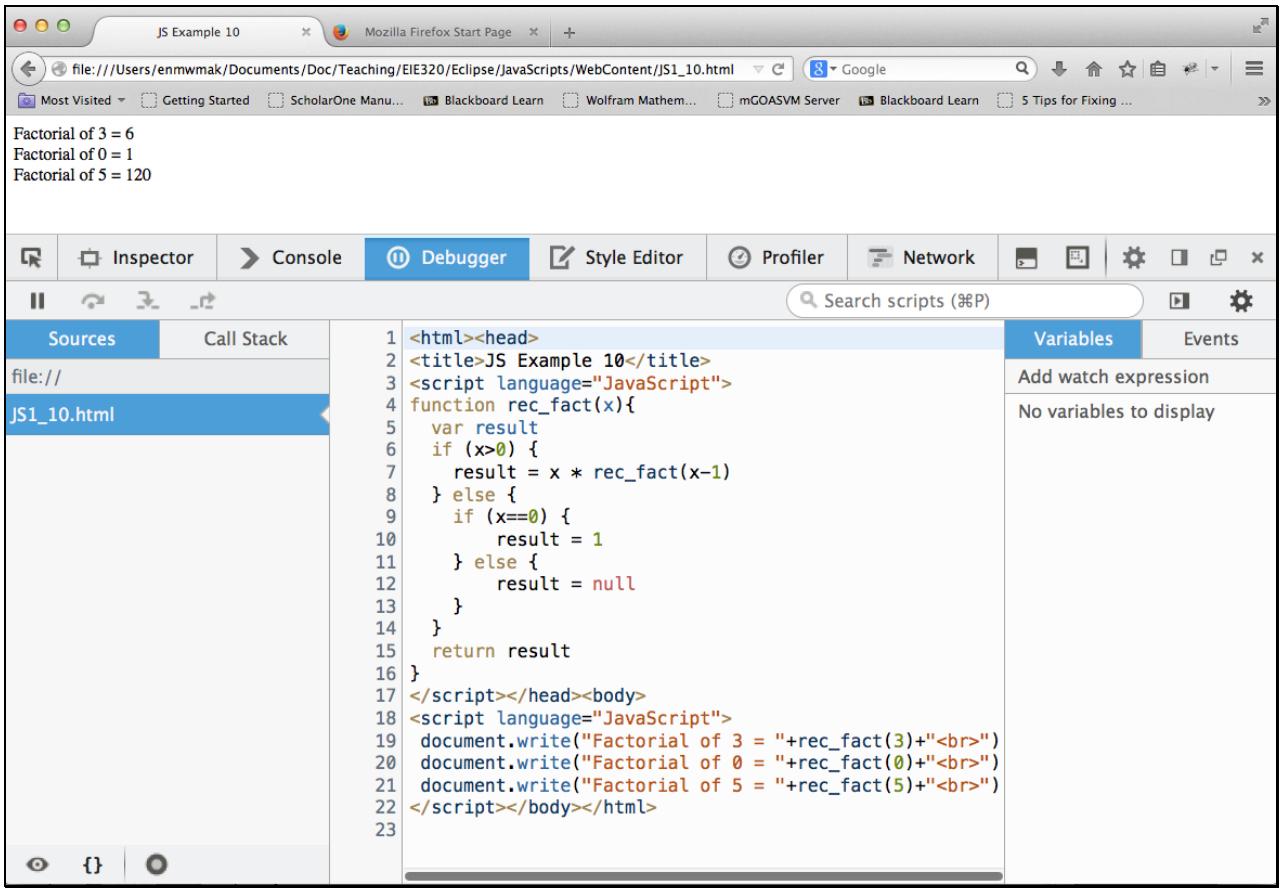
EIE3320 Tutorial 6: Java Web Programming (HTML and JavaScript)

(Deadline for Submission: Check the course information)

Introduction

You are suggested to turn on the Debugger in Firefox when developing the following JavaScript.

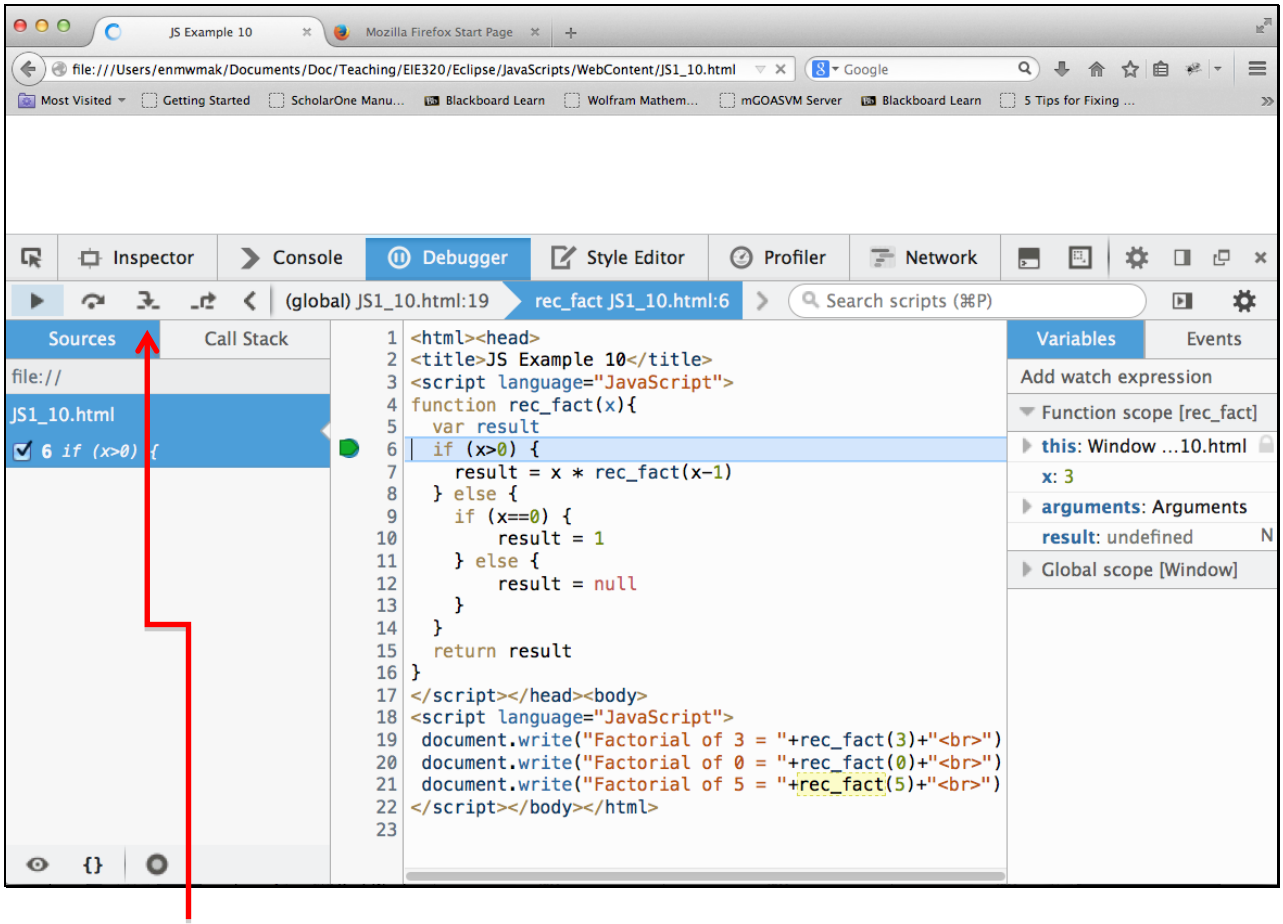
Step 1: Download "JS1_10.html" from http://www.eie.polyu.edu.hk/~enhylin/JS.html. Then, open it in FireFox. To turn on the debugger, select manual button → Developer → Debugger. You should see the following:



Step 2: Click a line in the Debugger Window at which you want the script to pause, e.g. Line 6.

```
3  <script language="JavaScript">
4  function rec_fact(x){
5    var result
6    if (x>0) {
7      result = x * rec_fact(x-1)
8    } else {
9      if (x==0) {
10         result = 1
11     } else {
12         result = null
13     }
14   }
15   return result
16 }
17 </script></head><body>
```

Step 3: Execute the JavaScript by refreshing the page in Firefox.  . If your JavaScript is triggered by an event, e.g., button click, you may simply click the corresponding button. You should see the following:



Step 4: Click the "Step In" button and observe the change in the variable x at the right panel.

In case you want a more sophisticated debugger, you may install Firebug on your FireFox and visit http://www.w3resource.com/web-development-tools/firebug-tutorials.php for a tutorial.

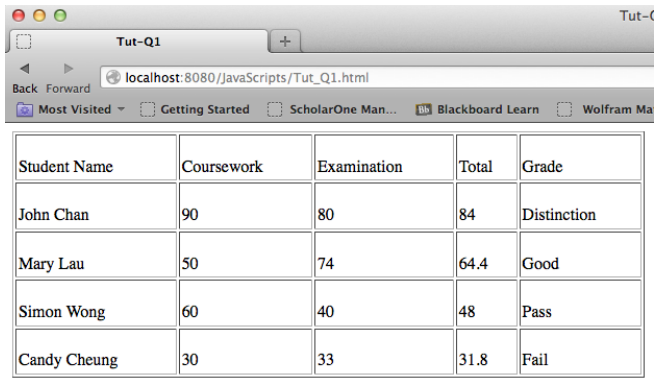
1. Create a web page to display the result of four students. Your source file should create three arrays to store their names, their marks in coursework and examination respectively:

Name	**Coursework**	**Examination**
John Chan	90	80
Mary Lau	50	74
Simon Wong	60	40
Candy Cheung	30	33

Note that no external inputs are required and all data are stored in the web page. You should use JavaScript to compute the total marks and their grades. The coursework and the examination carry 40% and 60% of the total marks, respectively. The grade distribution is shown below:

Distinction:	80 – 100
Good:	60 – 79
Pass:	40 – 59
Fail:	0 – 39

A sample output is shown below.



Student Name	Coursework	Examination	Total	Grade
John Chan	90	80	84	Distinction
Mary Lau	50	74	64.4	Good
Simon Wong	60	40	48	Pass
Candy Cheung	30	33	31.8	Fail

Hints:

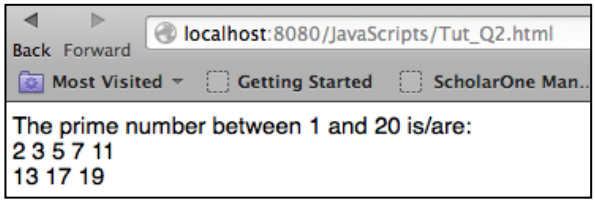
```
<script language="javascript">
	var names = new Array("John Chan","Mary Lau","Simon Wong","Candy Cheung");
	var coursework = new Array(90,50,60,30);
	var exam = new Array(80,74,40,33);
	var myTable = "<table border='1' cellpadding=\"2\" cellspacing=\"2\"
width=\"50%\">"
	var total = new Array(name.length);
	var grade = new Array(name.length);
	for (var i=0; i<exam.length; i++) {
		total[i] = 0.4*coursework[i] + 0.6*exam[i];
		var x = total[i];
		switch(true) {
			case (____________): grade[i] = "Fail"; break;
			case (____________): grade[i] = "Pass"; break;
			case (____________): grade[i] = "Good"; break;
			case (____________): grade[i] = "Distinction"; break;
```

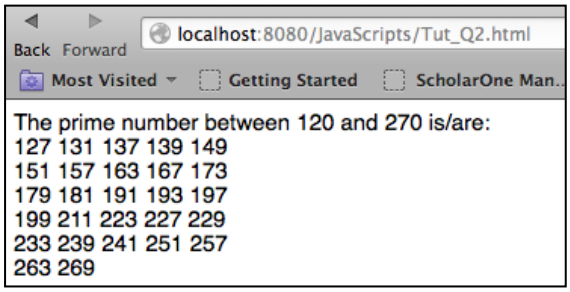
```
        }
    }
    myTable +=  "<tbody>"
    myTable +=  "<tr>"
    myTable +=  "<td valign='top'><br>Student Name</td>"
    myTable +=  "<td valign='top'><br>Coursework</td>"
    myTable +=  "<td valign='top'><br>Examination</td>"
    myTable +=  "<td valign='top'><br>Total</td>"
    myTable +=  "<td valign='top'><br>Grade</td>"
    myTable +=   "</tr>"

    for (var i=0; i<names.length; i++) {
        myTable +=  "<tr>"
        myTable +=  "<td valign='top'><br>"+__________ +"</td>"
        myTable +=  "<td valign='top'><br>"+__________ +"</td>"
        myTable +=  "<td valign='top'><br>"+__________ +"</td>"
        myTable +=  "<td valign='top'><br>"+__________ +"</td>"
        myTable +=  "<td valign='top'><br>"+__________ "</td>"
        myTable +=   "</tr>"
    }
    myTable +=   "</tbody>"
    myTable += "</table>"
    document.write(myTable);
</script>
```

If you copy-and-paste this script to Eclipse, beware that you will also copy the control characters used by Microsoft Word. To solve this problem, you may copy the script to Notepad first. Then, copy the text from Notepad to Eclipse.

2. Create a web page to count the prime numbers between two integers. It should include a function to identify whether an integer is a prime number or not. The display of the web pages should look like this:





Hints:

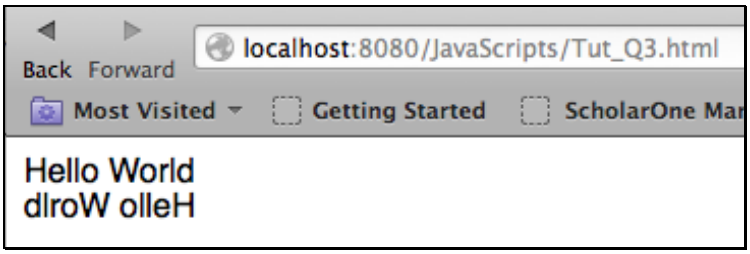
```
<script language="javascript">
function isPrime(n) {

      <!-- Complete the missing code here -->

}
var a = 120;
var b = 270;
var count = 0;
document.write("The prime number between " + a + " and " + b + " is/are: <br>");
for (var i=a; i<=b; i++) {
      if (isPrime(i)) {
            document.write(i + " ");
            count++;
```

```
            if (count%5==0) {
                  document.write("<br>");
            }
      }
}
</script>
```

3. Create a web page to show a string and its reversal. It should include a function to reverse a string. The display of the web pages should look like this:



Hints:

```
<script language="javascript">
      function reverse(s) {
            . . .
      }
      var str = "Hello World";
      document.write(str + "<br>");
      document.write(reverse(str) + "<br>");
      document.write("<br>");
</script>
```

4. Create a web page to compute the roots of a quadratic equation. At the beginning, the web page prompts users to input the value of three coefficients of a quadratic equation (see Fig. Q1(a)). Then, after users click a button, the roots of the quadratic equation are shown below the button. You may use the following formula to find out the roots of a quadratic equation:

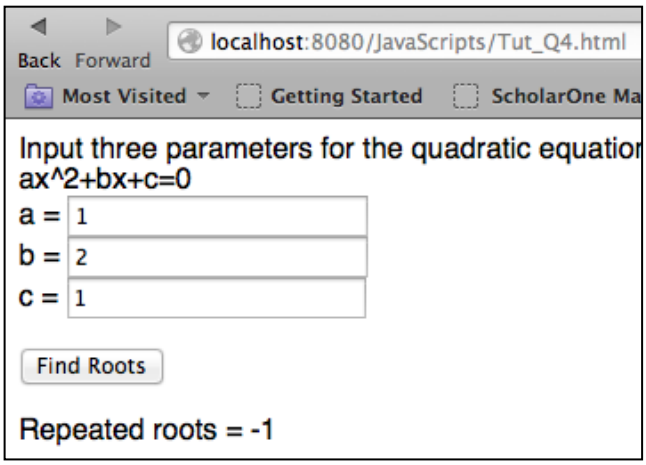
If $ax^2 + bx = c = 0$, root $= \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

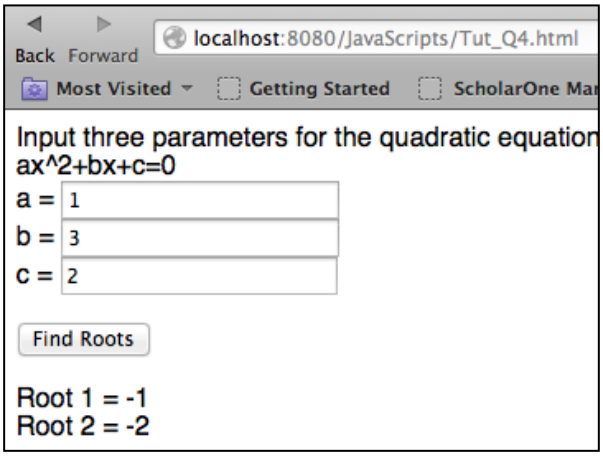
If $b^2 - 4ac = 0$, the equation has repeated roots.

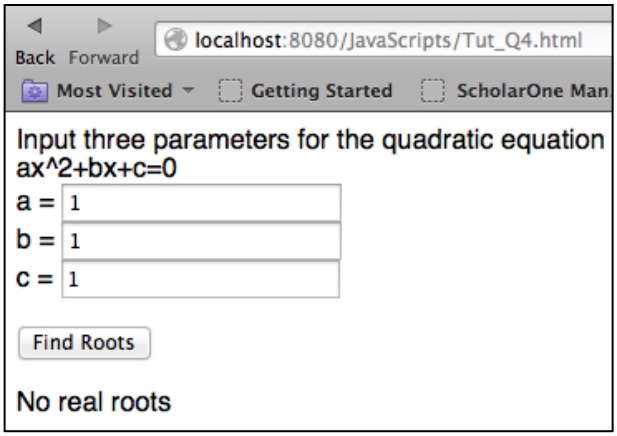
If $b^2 - 4ac > 0$, the equation has two real roots.

If $b^2 - 4ac < 0$, the equation has no real roots (do not do the calculation in this case).

You may use the following functions:
parseFloat(s): This function convert the string s to a floating point number.
Math.sqrt(x): This function returns the square root of a floating point number x.
document.getElementById('….').innerHTML
 ….







Hints:

```
<script language="javascript">
function qroot(a, b, c) {
      var disp = "";

      <!-- Complete the code here -->

      document.getElementById('answer').innerHTML=disp;
}
</script>
<form name="FindRoot">
a = <input type="text" name="coeff_a"> <br>
b = <input type="text" name="coeff_b"> <br>
c = <input type="text" name="coeff_c"> <br>
<br> <input type="button" name="findRoot" value="Find Roots"
   onclick="qroot(this.form.coeff_a.value,this.form.coeff_b.value,this.form.
coeff_c.value)">
</form>
<br>
<p>
<div id="answer"></div>
</p>
```

5. (**Assignment)** Create a web page to check the input of two fields (see Fig. Q5(a)). The followings are the rules:
   a) If the name field is empty (or blank) or both fields are empty (or blank), an error (alert) message should be displayed whatever the "add" button or the "search" button is pressed (see Fig. Q5(b)).
   b) If the name field is not empty but the telephone number field is empty (see Fig. Q5(c)), an error (alert) message should be displayed whatever the "add" button or the "search" button is pressed (see Q5(d)).
   c) If both fields are not empty (see Fig. Q5(e)), an alert message should be displayed (see Fig. Q5(f) and Q5(g)) when the "add" button or the "search" button is pressed.

   Capture the outputs of your program. Your screen capture should contain your name.

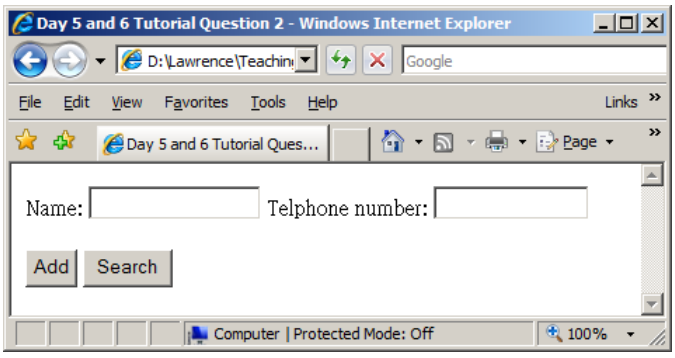


Fig. Q5(a)

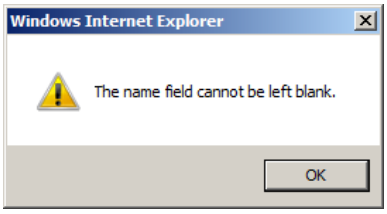


Fig. Q5(b)

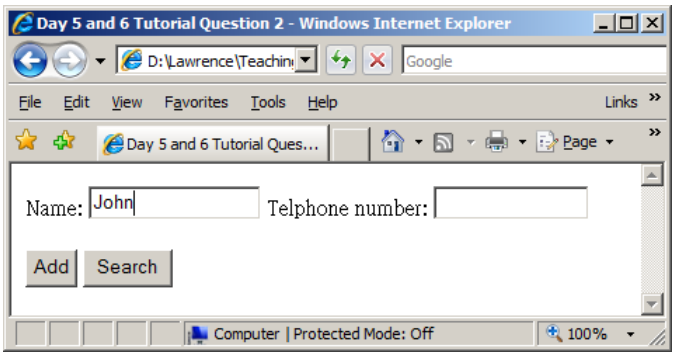


Fig. Q5(c)

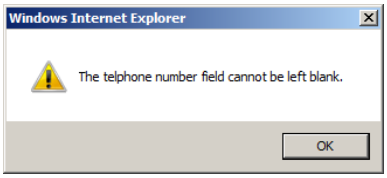


Fig. Q5(d)

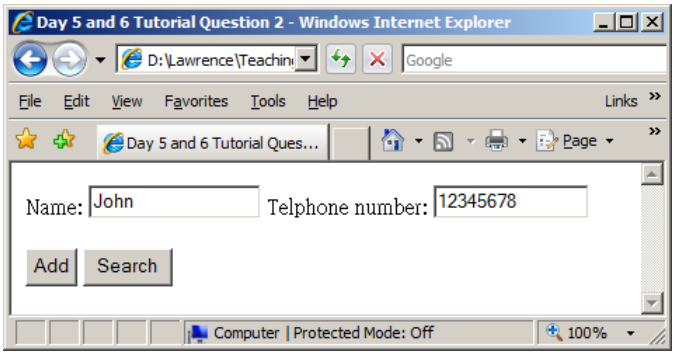


Fig. Q5(e)

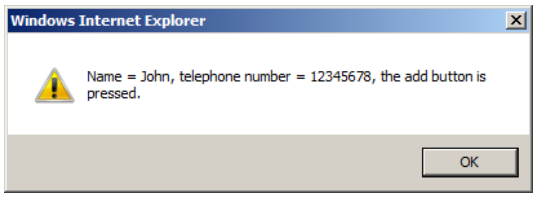


Fig. Q5(f)

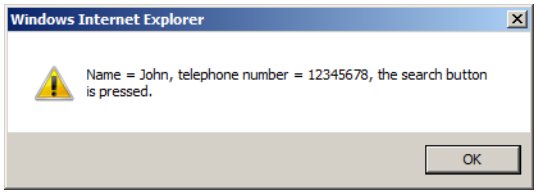


Fig. Q5(g)

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