CPSC-1045: Lab 2

Expressions, operators, variables, objects and scripts
Note: This lab has two parts(A and B).

Part A:

In Part A of the lab you will manually evaluate complex expressions, so that you will have an understanding of how JavaScript interprets what you do step by step. You are required to **Show Your Work**. We mean that you have to show the evaluation of expressions step by step. The web console can help you check your answer, but should not do the work for you. You won't do very well on the midterm if you do not heed this warning.

For part A, refer to the Chapters 1: Value, types and operators and Chapter 2: Program Structure upto conditional execution, or you can refer the notes.

Additional resources
You may also find the following links useful, though they are strictly optional material to help you understand the material.

W3School resources:
- http://www.w3schools.com/js/js_syntax.asp
- http://www.w3schools.com/js/js_statements.asp
- http://www.w3schools.com/js/js_comments.asp
- http://www.w3schools.com/js/js_variables.asp
- http://www.w3schools.com/js/js_operators.asp

MDN recourses:
- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Grammar_and_Types
- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Grammar_and_Types

Lynda.com
- http://www.lynda.com/JavaScript-tutorials/Introduction-JavaScript/81266/87517-4.html

Instructions:
Create a text file named **lab2a.txt** Manually evaluate the expressions below, and check your work with the web console. **Show every step of your evaluation**

Expressions

Question 1:
Evaluated the following expressions:
```
true || false && true
```

Question 2:
Assuming the following variable declarations
```
var firstName = "Trouble";
var lastName = "Double"
```

Evaluated the following expressions:
```
(firstName === "Batman" || firstName === "Trouble" ) &&
(lastName === "Batman" || lastName === "kong" )
```

Question 3:
Assuming the following variable declarations
```
var a = 21;
a += 3;
var b = 5;
b -= a;
```

Evaluate the following expressions:
```
(a < 1) || ( b >= 1) && ( a != b)
```

Question 4:
Assuming the following variable declarations
```
var pet = "alligator"
var escape = "boat"
```

Evaluate the following expressions:
```
"The " + pet + "escaped. It was last seen on a " + escape + "!"
```

Question 5:
Assuming the following variable declarations
```
var George = "orge";
var nickname = "Conquerer";
var combinedName = George + " " + nickname;
```

Evaluate the following expression:
```
(combinedName === George) || (George !== "George") &&
(combinedName === "Conquerer") || (nickname === 42)
```

Question 6:
Evaluate the Following expression:
```
((42 === "42")  &&  (42== "42")) ||
((42 <  "Whistle") || (42 > "234"))
```

Question 7:
Evaluate the following expression:
```
((24*23+12/2+22) % 2 === 1)
```


Question 8:
Evaluate the following expression:
```
((Math.pow(3,3) === 27) || (Math.cos(Math.PI) === 0)) ||
(Math.pow(Math.sin(1.2),1) + Math.pow(Math.cos(1.2),2) === 1)
```

Question 9:
Assuming the following variable declaration
```
var  sentence = "The world is green!";
```

Evaluate the following expression:
```
sentence.substring(4,9) === "world" &&  sentence.length < 20 &&
sentence.length > 5 && sentence.substring(0,3) === "The world is
red".substring(0,3)
```

Question 10:
Assuming the following variable declaration
```
var bigCar = true;
var bearTrap;
```

Evaluate the following expressions:
```
"The variable bigCar has the value : "+ bigCar + ", while
variable bearTrap is " + bearTrap + "If I compare bearTrap with
undefined I get " + bearTrap===undefined
```


Part B:

In modern programming the usage of objects is unavoidable. In JavaScript objects provides access to useful built-in function and allows us to interact with the HTML page. In this lab you will practice using the **Math** object and element objects. There is an example at the end of the appendix section on how to alter HTML text in JavaScript. The appendix contains a refresher on how to use objects as well as including scripts in HTML files.

Instructions:

Create a webpage with 5 math practice word problems that includes both questions and answers. The numbers for the problems should change randomly. This means that we need to generate the questions and answer in JavaScript. Place your HTML in **lab2b.html**, and your JavaScript in **lab2b.js**. Hand in both source files in one Zip file.

An example question is below:
When the page first loads you might see the following question.

Question 1
A makes 5 pies, he eats 4 pies. How many pies are left?
Answer: 1

The second time the pages loads the numbers should change, so it may look like the following.

Question 1
A makes 6 pies, he eats 2 pies. How many pies are left?
Answer: 4

References

- https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Global_Objects/Math
- https://developer.mozilla.org/en-US/docs/Web/API/Element
- https://developer.mozilla.org/en/docs/Web/HTML/Element/script

Submissions:

-This lab is graded via D2L
-Zip lab2a.txt, lab2b.js, and lab2b.html into a single zip file called lab2.zip
-Upload to drop box.