CS 1100: Web Development: Client-Side Coding / Fall 2016
Lab 8: Functions and conditional statements

Goal

- Practice simple and multi-step conditional statements
- Use comparison and logical operators
- Continue exploring the DOM API
- Practice using functions

Work in Pairs

This lab is a work-in-pairs exercise. Find a partner and work together. You may check lab 6 for a description of how (and why) to work in pairs. ONLY ONE PERSON NEEDS TO SUBMIT THE LAB. MAKE SURE YOUR FILE INCLUDES A COMMENT AT THE VERY TOP LISTING BOTH OF YOUR NAMES.

Setup

Download the lab8.zip file and extract it. Inside you will find four files: a web page, a stylesheet, a JavaScript file, and an image. Open these files in your favorite text editor. Open the lab8.html file in a browser.

Description

Welcome to Middle-earth, traveller! Your task today is quite simple: you must make it to the safe haven of Lothlorien (marked with a green rectangle). Middle-earth is relatively safe at this time, so you should be able to make it to your destination without any difficulties, as long as you don't wander into Mordor (marked with a dark red rectangle). To accomplish your task, you will move your mouse pointer to Lothlorien; the message box at the top (the white rectangle with the dark blue border) will tell you where you are at and whether you have reached your destination.

Implementation

REMINDER: DO NOT COPY AND PASTE CODE FROM THIS PDF: THIS MAY CAUSE CHARACTER ENCODING ISSUES AND YOUR CODE WILL NOT WORK. TYPE IT YOURSELF!

In this lab you will write a program that reacts to mouse movements and clicks. We haven't reached events yet, so the necessary code is provided for you. Your JavaScript file contains some code to get you started. Take a look at it.

You have a function defined for you: showMessage. It is called every time your mouse pointer moves.

The function provides you access to the mouse pointer's coordinates; variables mouseX and mouseY. Think of the screen as a coordinate plane where the top left corner has coordinates x = 0; y = 0. Thus, if you move your mouse 500 pixels to the left, your coordinates would be x = 500; y = 0. If you then moved your mouse 300 pixels down, your coordinates would x = 500, y = 300.

Step1. Display a message with the current mouse coordinates in your message box.

1) First, build up the string you want to display. You want the text to show something like this:
You are at x=400 y=300
- where 400 is the current value of mouseX and 300 is the current value of mouseY

To do that:
1) Get the message div element and store it in a variable:

```
var messageBox = document.querySelector("#message");
```

2) Build up the string you want to display:
```
var text = "You are at x=" + mouseX + " y=" + mouseY;
```

3) Use the innertText property to assign your string to the message div:
```
messageBox.innerText = text;
```

Now test it! Save your file, refresh your page and start moving your mouse. Your message box will be showing your current coordinates.

Step 2. Now let's check to see whether you (or the traveller you are guiding through the perilous wilderness of Middle-earth) are in Lothlorien. If so - say so in your message box; otherwise - say something else. For example:

if you are in Lothlorien, your message box will display this:
You are at x=600 y=400. You have reached Lothlorien!

If not: You are at x=100 y=200. You are still on your way...

How do you do this? First, let's get the coordinates of Lothlorien! We really need just these four values:

1. the x coordinate of its top left corner
2. the y coordinate of its top left corner
3. its width
4. its height

Here's how you get them:

```
var target = document.querySelector("#lothlorien");
var targetX = target.offsetLeft;
var targetY = target.offsetTop;
var targetWidth = target.clientWidth;
var targetHeight = target.clientHeight;
```

Now you know everything you need about: (a) where your mouse is; and (b) where it should be.

How do you check if it is within the target rectangle? What does ***within***, or ***inside*** really mean here? Think in terms of coordinates...

Here's one possible approach: your mouse pointer is inside Lothlorien if:

1. your mouse X coordinate is greater than Lothlorien's left border's X coordinate, **AND**
2. your mouse X coordinate is less than Lothlorien's right border's X coordinate, **AND**
3. your mouse Y coordinate is greater than Lothlorien's top border's Y coordinate, **AND**
4. your mouse Y coordinate is less than Lothlorien's bottom borders Y coordinate.

But we don't know the values for conditions 2 and 4! But we know the width and height of the target rectangle! So the right X coordinate is X + width; and the bottom Y coordinate is Y + height!

For simplicity, let's assign each of these conditions to a variable:

```
var test1 = mouseX > targetX;
var test2 = mouseX < targetX + targetWidth;
var test3 = mouseY > targetY;
var test4 = mouseY < targetY + targetHeight;
```

If all of these conditions are true, we have arrived! Let's implement this functionality:

```
if (test1 && test2 && test3 && test4) {
        messageBox.innerText = "You have arrived!";
}
```

Last challenge. If you have time left, try to make your message more informative: tell your traveller where they need to move. For example, if they are south of Lothlorien, they should move north. To do this you would need to test EACH of our conditions separately, and, most likely, you would need to use the NOT operator. For example:

```
if (!condition) { do something }
```

That's all for today!

Submit your work

Save your lab8 folder as a zip file and submit the zip file to eLearning:
https://bb9.uni.edu > log in with CatID > our course > Course Content > Labs > Lab 8

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