Algorithms and Intro to JavaScript

This lab will have two parts to it. The first part will introduce you to the idea of Algorithms, which is a way that computer programmers design a step by step process. Algorithms are discussed in Chapter 10 of your book.

The second part of the lab will introduce you to JavaScript, which is the language that makes web pages dynamic. You won’t be required to program anything using JavaScript for this lab.

Part 1: Algorithms

Goal: Write down an algorithm for a simple real life task. An algorithm has three main parts: inputs, steps, and output. As an example, here’s an algorithm for starting a car.

Starting a car:

1) Inputs: tools needed to complete the tasks
   - Car
   - Car key

2) Steps: instructions on how to complete the tasks
   - Insert car key into lock on car door
   - Turn car key right to unlock car door
   - Open car door
   - Sit inside car in the driver’s seat
   - Insert car key into ignition
   - Turn car key right until car starts

3) Output: end result or action
   - Car starts

You can write your algorithm in a text editor of your choice (Notepad++, LibreOffice etc). Remember to specify the three components: Inputs, Precise Steps, and Output. Choose one of the following simple tasks to illustrate in your algorithm:

(a) Write an algorithm to change batteries in a flashlight.
(b) Write an algorithm to make mashed potatoes.
(c) Write an algorithm to brush your teeth.

Remember to specify all necessary inputs. What ingredients are required for the potatoes, etc. Be sure to number your steps and make each step simple and precise.
Part 2: Introduction to JavaScript

Goal: Write down an algorithm for a JavaScript program.

In this part of lab you will play around with a few JavaScript programs to get a feel for how JavaScript can make a web page dynamic. I have listed three websites below, pull up any of the three to get a feel for how it works.

Once you feel like you understand what the program is doing, explain the algorithms that are being used behind the scenes when you click on the calculate button. Write down the algorithm in the editor of your choice. When you have to specify the inputs to the algorithms you can refer to the boxes on the web page. For instance your algorithm might say:

*The web page takes the data in the box labeled “miles” and then multiples it by 1.61 to get kilometers when I click on the button labeled “calculate”*

I want you to write down an algorithm for one of the following web pages. Choose whichever you prefer. You will be graded on how well you can describe what happens so go over it a couple of times to make sure the algorithm used on the web page is specified clearly. You are not required to reproduce or discuss any of the mathematical formulas being used.

Here are the websites you can choose from:

- [http://www.csgnetwork.com/runracepacecalc.html](http://www.csgnetwork.com/runracepacecalc.html) is a website where you can calculate average walking or running speeds from the given input.
- [http://www.csgnetwork.com/basketballstatscalc.html](http://www.csgnetwork.com/basketballstatscalc.html) is a website where you can calculate statistics for a basketball player.
- [http://www.csgnetwork.com/lawnacrecalc.html](http://www.csgnetwork.com/lawnacrecalc.html) is a website where you can calculate the number of acres given the dimensions of a rectangular plot.

**What You Should Turn In**

You should turn in the document you have created describing the algorithms in part 1 and part 2.