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CISC 3160: Lab 4

Programming Languages:
- Python
- JavaScript

List of Sources:
- Python:
    - Matthes, Eric. *Python Crash Course: a Hands-on, Project-Based Introduction to Programming*. No Starch Press, 2019.
        - Annotation: This is a pretty good introduction for learning the language. The major benefit of using this book is that there is some level of structure available that is not usually available for other online sources and the author did a good job explaining the foundational concepts.
    - https://learnxinyminutes.com/docs/python/
        - Annotation: This is a nice quick method of simply checking for something specific very quickly. Although there is a good amount of information available on the website, sometimes there could be things that are not there and other sources have to be used.
    - www.python.org/doc/
        - Annotation: This is the official documentation. The major benefit of using this source is that it usually goes into the most amount of detail on specific aspects of the programming language. Also there is a nice amount of variety that can cater to people of different skill levels. The major problem with this source is that it usually has so much information that it can be intimidating to know what to look for.

- JavaScript:
    - Haverbeke, Marijn. *Eloquent JavaScript: a Modern Introduction to Programming*. No Starch Press, 2019.
        - Annotation: The benefit of using a textbook is that the author does their best to create a level of structure when learning the language, and that can make the barrier to entry much easier for people who are starting out. Also there are many example problems that are available so that key concepts can be understood.
    - https://learnxinyminutes.com/docs/javascript/
        - Annotation: Again this is a nice quick tool to look up for specific information. Sometimes there could be things that you are looking

for that are not available, such as things that are not relating to syntax but more-so concepts. However, generally this is a good source for a quick check-up.

- https://www.w3schools.com/js/DEFAULT.asp
    - This is a nice and open source tool to learn JavaScript. The major benefit with this tool is that it provides quick quizzes so that you can practice as you learn, which provides a good way to consolidate the information that was just consumed.

Project:

Implementing two sorting algorithms in Python and JavaScript. The chosen algorithms are the bubble sort and the selection sort.

Pseudocode:
- **Bubble Sort**

BubbleSort(array)

      For item 'i'=0 to array length - 1

            For item 'j' to array length - i - 1

                  If the value at array index 'j' is greater than the next element in the array,

                  Then swap the values.

      Return array

- **Selection Sort:**

SelectionSort(array)

      For item 'i'=0 to array length - 1

            Min = 'i'

            For item 'j' to 'i'+1

                  If the value at index Min is greater than the value at index J, assign Min

                   the value of J.

            End For

      Swap value at index i and index Min

      Return array

Reference Guide:
What is required to know in order to implement these algorithms:
- Initializing and assigning values to variables.
- Creating conditional statements, more specifically, through the use of if and else statements.

- Creating and iterating through a loop.
- Creating a function that can take parameters.

1) **<u>Python:</u>**
   Source: <u>https://learnxinyminutes.com/docs/python/</u>
   - ➢ Initializing an int variable, a string variable, a boolean variable, and an array:
     - ○ var = 10 #Some of the nice features of python is that types are handled automatically and semi-colons are not needed.
     - ○ var2 = "This is a sentence"
     - ○ var3 = True;
     - ○ Array = [item1, item2, …, itemN]
   - ➢ Creating a conditional statement:
     - ○ If condition: #Again indentation is important
         Action
     - ○ elif condition: #this is the keyword for else if
         Action
     - ○ else condition:
         Action
   - ➢ Creating a for loop:
     - ○ for item in itemList: #iterating through an array.
         action
     - ○ for item in range(ending_pos): #iterating up to the ending point.
         action
     - ○ for item in range(starting_pos, ending_pos: #iterating within range values.
         Action
   - ➢ Creating a function:
     - ○ def functionName(parameters) :
         action
         #again indentation is important, without it the program does not work.

2) **<u>JavaScript</u>**
   Source:https://www.w3schools.com/js/js_variables.asp
   - ➢ Initializing an int variable, a string variable, and then a boolean variable:

- var variable1 = 10;
  - var variable2 = "This is a string";
  - var variable3 = true;
  - var array = [item1, item2, …, itemK];
    - Source: https://www.w3schools.com/js/js_arrays.asp
- Creating a condition statement: Source:
  https://www.w3schools.com/js/js_if_else.asp
  - if(condition){action}
  - else{action}
  - else if(condition){action} // The syntax is very similar to java
- Creating a for loop: Source :
  https://www.w3schools.com/js/js_loop_for.asp
  - for(condition){action}
- Creating a function: Source:
  https://www.w3schools.com/js/js_functions.asp
  - function functionName(parameters){action}