Name: _____ Form A

CS 002 Final Practice 0: Conceptual Questions. (Last Updated: Spring 2021)

1. Explain the difference between using cin, cin.get(), and cin.getline() for input.

2. What is Top Down Design? What is Procedural Abstraction?

3. What are some differences between a C String and the standard string class in C++ (3) ?

4. Explain how the call-by-value mechanism works, and how it differs from the call-by-reference mechanism. Draw diagrams and give an example as necessary.

5. What are some differences between arrays and vectors in C++ (3) ?

6. Suppose that an array of size 5 is declared, of type double (8 bytes).

```
double theArray[5];
```

   Also, suppose that the computer assigns the memory address 2100 to the variable at index 0. Explain how the computer would access theArray[3], and what the memory address would be. Draw diagrams as necessary.

7. Given the contents of a sorted array of size 8, shown below, show which indices of the array will be visited, and in what order, if the algorithm BinarySearch was to be performed on this array for the number 81.

```
int theArray[] = {72, 74, 75, 77, 78, 82, 84, 86};
```

8. Given the contents of an array of size 4, shown below, show what the contents of the array would look like after each iteration of the algorithm SelectionSort, for 3 iterations, including relevant indices.

```
int theArray[] = {41, 51, 47, 49};
```

9. Given the contents of a sorted array of size 5, shown below, show which indices of the array will be visited, and in what order, if the algorithm BinarySearch was to be performed on this array for the number 11.

```
int theArray[] = {11, 12, 15, 21, 24};
```

10. Given the contents of an array of size 5, shown below, show what the contents of the array would look like after each iteration of the algorithm SelectionSort, for 3 iterations, including relevant indices.

```
int theArray[] = {82, 78, 92, 85, 87};
```

Problem of Interest for the Lab Question

Write a program that does the following tasks.

- All output should be labelled accordingly.
- You should only use features, functions, and routines already discussed in class.
- You should make good use of how C++ features work whenever possible.
- Be sure to use proper top down design techniques and include an appropriate number of functions with an appropriate amount of arguments.

1. Read in numbers from "inputIntegers.txt" until there are no more numbers, and stores the results of each entry into an array of size 8. For each entry, if the number is less than 10, then result should be true, otherwise false.
2. Print the array with the following twist; for true entries, display the word "TRUE" in all caps, "FALSE" otherwise. There is a newline character between each entry.
3. Ask the user to enter a word. If nothing is entered, let the user know, but otherwise change the 4^{th} letter to a "k". You may assume the user always enters valid input. Do this twice.

Sample output:

TRUE

TRUE

TRUE

FALSE

FALSE

TRUE

TRUE

FALSE

Name: _____ Form A

Enter a word:

You entered nothing!

Enter a word: bamboozled

New word: bamkoozled