CS 150 Lab 10
Files and Functions

The purpose of today's lab is for you to get comfortable with reading character by character from files and working with functions.
· Be sure to answer the given questions before you start
· Be sure your output looks exactly like the specified output
· Be sure to submit your solution to CS150-02 Lab when you are done (By Friday, 5pm)
· In this lab, you are to answer the questions listed and show the instructor or TA before making any changes or running any program. We are going to do each section as a class. Please don't work ahead.

In the **CS150-02 Public** directory is a Visual Studio project called **echoFile**. Grab this project and place it in a folder called **PUNetIDFilesFunctions**.

Part I

The C++ code looks like:

```cpp
#include <iostream>
#include <fstream>
#include <cstdlib>

using namespace std;

int main ()
{
  ifstream inFile;
  char ch;
  unsigned int count = 0;

  inFile.open ("text.txt");
  if (!inFile)
  {
    cout << "Error opening file" << endl;
    exit (-1);
  }

  while (inFile.get(ch))
  {
    cout << ch;
    ++ count;
  }

  cout << "\nNumber of characters = " << count << endl;
  return 0;
}
```

The datafile looks like:

```
1
23
456
7890
```

Q1: What is the output from executing the above program **(without executing your program)**?

Part II

Replace the section of code on the left with the code on the right and then answer Q2.

```while (inFile.get(ch))```
```{```
```   cout << ch;```
```   ++count;```
```}```
	```while (!inFile.eof ())```
	```{```
	``` inFile.get (ch);```
	``` cout << ch;```
	``` ++ count;```
	```}```

Q2: What is the output from executing the program with the changes made**(without executing your program)**?

Part III

In the assignment you are working on there are problems with the code on the left and on the right in Part II. We will come back and talk about this later. For now, replace the section of code on the left with the code on the right.

```while (!inFile.eof ())```
```{```
```   inFile.get (ch);```
```   cout << ch;```
```   ++ count;```
```}```
	```if (!inFile.eof ())```
	```{```
	``` inFile.get (ch);```
	```}```
	
	```while (!inFile.eof ())```
	```{```
	
	```}```

Q3: What is the code to be placed inside of the while loop so that the input file is echo printed correctly and the correct number of characters is outputted.

P1: Add the code from Q3 in your project and run the program. Is your result correct? If not, why not?

Part IV

A datafile consists of uppercase letters, numbers, and special characters space, period, comma, semicolon, and exclamation point. You are to modify the program you are currently working on to make the input file displayed as a secret code in the following way:

1. Each character of a word is to have 1 added to its ASCII value before outputting.
2. Each character of a number is to have 1 subtracted from its ASCII value before outputting.
3. Each of the special characters is to be outputted just as it is.

To solve 1. use the following prototype:

```
unsigned int secretWord (ifstream &, char &);
```

The function secretWord accepts an input file stream variable and a character both passed by reference. Remember, for each character of the word, add 1 before outputting the character. The function is to read characters until a non-Word character is read from the file. Return the number of characters processed by the function secretWord.

P2: Write the function secretWord first and show me before typing in your solution.

Change the input datafile to the following and test your solution.

```
THIS IS A TEST.
1234.
THE END!
```

P3: Finally, modify the main function to call secretWord if the current character is an uppercase letter. If the character is not an uppercase letter, simply print out the character to the screen and get another character. Run your program and show me the results.

Part V

Write the function secretNumber which accepts an input file stream variable and a character. For each character of the number, subtract 1 before outputting the character. The function is to read characters until a non-Numeric character is inputted. Return the number of characters processed by the function secretNumber.

P4: Write the function first and show me before typing in your solution.

P5: Finally, modify the main function to call secretNumber if the current character is a number. If the character is not a number or upper case letter, simply print out the character to the screen and get another character.

Part VI

P6: Add on the final function for the other possible characters and modify the main function so the output is correct and the correct number of characters is displayed at the end.