Lab #1
C Functions, Loops and Control

Purpose:

The purpose of this lab is to write some code in C that uses aspects of the language that has been covered in class thus far.

Source code files for the lab are on Canvas. You will save all your source files for the lab to the GitHub account you created in Lab 0.

Preparation:

Review class presentations and chapters from the text according to the syllabus.

Procedure:

1) Start up CodeLite and open the workspace ECEGR2020 you created for Lab 0

2) In the workspace, create a new project: File -> New -> New Project. Name the project Lab_1 and make the Type a "Simple executable (gcc)"

3) Download the main.c file from Canvas and copy it into the Lab_1 folder overwriting the file that is there

4) Compile the program. Run and debug it to see how it works

5) For each function below, program, run and debug each. In your lab report, be sure to place the output of each function to show that your program worked.

Program the Following:

A) Create a function with the declaration void SizeOfVariables(void);

   In the body of that function, declare the following variables:

```
char c;
short s;
int i;
unsigned int ui;
unsigned long int ul;
float f;
double d;
long double ld;
void *ptr;
```

Printout the size in bytes of each variable along with the name of the variable.
Call SizeOfVariables () from main() to see the output

B) Create a function: int IsLeapYear(int aYear);

In that function, determine if the given year is a leap year using the following rules:

- There were no leap years before 1752.
- If the year divides by 400 then it is a leap year.
- All other years that divide by 100 are not leap years.
- All other years that divide by four are leap years.

For example, 1800,1900 were not leap years but 2000 is; 1904, 1908,...,1996 were leap years.

Print out the year and if it is or is not a leap year.

Return 1 from the function if the year is a leap year, 0 if not.

Test your function with 10 different years

C) Create a function: int IsVowel(char aLetter);

In that function, determine if the given character aLetter is a vowel or a consonant

If the given value of aLetter is not an ASCII letter, printout an error message

Return 1 if the letter is a vowel, 0 otherwise

Test with various letters and numbers

D) Create a function: void ReverseNumber(long aNumber)

In that function, reverse the digits of the given number

Print both the given number and the number with the digits reversed

Example: Number = 12345 Reversed = 54321

Test with 5 different numbers, including negative values

(Note – this is a common interview question!)