LAB ONE

INTRODUCING C

CS2263, Fall 2021

LEARNING OUTCOMES

At the conclusion of the lab, students should be able to

- Perform keyboard/terminal IO
- Program using format specifiers
- Program using control structures and simple calculations

ICE BREAKER

In your Learning Group, give your thoughts on

- Your favourite flavour of ice cream
- One thing you'd like to do before the start of Winter term in January

Students should "present" in ascending order of their first name

SUBMIT:

- the names of two people and their answers.

1. JAVA AND C

A. Implement the HelloWorld program in Java (i.e. a Java program that prints the string: Hello World). Compile and run the HelloWorld program.

SUBMIT:

- the source code
- directory listing from the directory where your program is stored showing the source code file(s) and the compiled program file(s) names.
- the screen shot of the output from your program

B. Implement the HelloWorld program in C as `helloworld.c` (i.e. a C program that prints the string: Hello World). Compile and run the HelloWorld program.

SUBMIT:

- the source code
- directory listing from the directory where your program is stored showing the source code file(s) and the compiled program file(s) names.
- the screen shot of the output from your program

C. Explain the differences between what compiling the source code results in, in case of Java as opposed to what happens with C programs. In particular, explain why when running the Java program, you needed to use the java command while there was no command needed to run the C program. Support your answer with at least one reference (from the textbook, from the library or from the web).

2. REPEATED DIGITS

Write a C program to count how many 1s are in the binary representation of a given number. For example, the number 52 is 110100 in binary and has three 1s.

The program obtains a number (in base 10) from the user and outputs whether there the number of 1s in the binary representation. For example,

```
Value to examine: 52
Number of ones: 3
```

Although we haven't yet learned input, you can use this sample code to read in an integer value:

```
int value;
int iErr;
printf("Value to examine: ");
iErr = scanf("%d",&value);
if(iErr != 1){
  printf("Unable to read the value\n");
}
```

While you are welcome to copy and paste this text into your program, be aware that word processors often have hidden characters that may cause problems.

The program must exit gracefully if the input is invalid (value is zero or negative)

Call your program `digitOnes.c`,

SUBMIT:

- the source code
- directory listing from the directory where your program is stored showing the source code file(s) and the compiled program file(s) names.
- the screen shot of the terminal, including your compile and testing (including examples where the numbers have different counts of ones).

SUBMISSION

Before the due date for this lab, students should submit a single zip or tar file (named *LastName_FirstName_Lab1.zip or LastName_FirstName_Lab1.tar*) online to the lms containing:

- the required material for each question (use the headings indicating the question number) in a single pdf file (named *LastName_FirstName_Lab1.pdf)*
- Your source code directory:
    - This should include all of your source files, including any test programs.
    - This should not include object (.o) files and executables. Nobody needs to see those.