CSP 509/CSP 609 PG Software Lab
Lab Assignment 4
Submission Deadline: August 29 2018 11:55pm
Total Weightage of the Assignment: 2%

General Instructions:

- All code and the makefile should be put into one folder. Name of the folder should be your roll number. Upload this zipped folder before the submission deadline.
- It is important to go through the prescribed reading material, there may be a lab test on this material later in the semester.
- Prescribed specifications must be strictly followed. Failure to do so may lead to substantial loss of points.

Important Resources (Read them first):

1. Compiling multiple source files: http://www.network-theory.co.uk/docs/gccintro/gccintro_11.html
2. Creating a static and a shared library: http://www.adp-gmbh.ch/cpp/gcc/create_lib.html
3. Tutorial on Makefiles: http://www.cs.colby.edu/maxwell/courses/tutorials/maketutor/
4. Another tutorial on Makefile: http://mrbook.org/blog/tutorials/make/

Question 1 (Coding with different files) (30 points)

In this question, we will create a simple example to illustrate compiling from different source files. Create a simple calculator using switch-case statement in C or C++. This calculator should perform addition, subtraction, multiplication and division on integers. Each time it should take two integers as input and an operator from the user and display the result (based on the operator chosen) on screen.

Instead of using operators provided in the C or C++, write functions for these. For example, instead of the using the operator "+" write a function add(int, int). Similarly write functions for other operators as well. Each of these functions should be in a different file. All these functions should be defined in a header file called "mycalc.h." What command should be used to compile these files?

Question 2 (Makefiles) (50 points)

Create a Makefile which provides the following options for creating an executable.

A. **Default option**: The final binary file has a main file and functions for all the operators
B. **Only addition and subtraction**: The final binary has a main file and functions for only for addition and subtraction.
C. **Only multiplication and division**: The final binary has a main file and functions for only multiplication and subtraction.

For each of these options you would have to write different int main(), potentially each in a different file.

Question 3 (10 points)

Repeat Question 2, using Macros. In this question, code for all the operators should be put in just one file .c file with appropriate #ifdefs and #endifs around the function definitions. Similarly, you also need to put #ifdefs and #endifs around different switch-cases (one for each option (a) (b) and (c) in Question 2 in the main file. Hint you would need to use gcc with -D <name of the flag> option for setting the <name of the flag>.

Things to Submit:

1. Submit all your code and make files.
2. All the files should have your name and roll number.
3. Put all the files in a folder and zip them. Upload the zipped file on the Moodle site.