INFO 1112
Principles of Program Structure and Design

Lab 6

Instructor
Kyungjae Lee (just call me KJ)
KyungJae.Lee@kpu.ca

Lab Activity 6.1 Implement Function block

```
#include <iostream>
using namespace std;

int maximum(int num01, int num02);

int main()
{
    int input01, input02;
    int answer;

    cout << "Please type two numbers to compare.\n";
    cout << "First number: ";
    cin >> input01;
    cout << "Second number: ";
    cin >> input02;

    answer = maximum(input01, input02);
    cout << "The maximum between two numbers  " << input01 <<
            " and " << input02 << " is " << answer << endl;
  return 0;
}

int maximum(int num01, int num02) {
    int answerMax;
    if (num01 > num02)
        answerMax = num01;
    else
        answerMax = num02;
    return answerMax;
}
```

```
Please type two numbers to compare.
First number: 9
Second number: 200
The maximum between two numbers  9 and 200 is 200
```

- Practice the way to declare a function, define it, and calling it inside main(). The following code demonstrates to find out the maximum between two numbers. Implement this code to evaluate whether two numbers are the same or not. Your output should look similar to the following. Save it as **compare61_yourLastnameInitial.cpp**.

```
Please type two numbers to compare.
First number: 5
Second number: 5
Two numbers are the same.
```

Lab Activity 6.2

Distance & Slope through Functions (extension of Lab 3.3)

1. Rather than writing all code inside one function block main(), separate your program into two separate functions to compute the both the distance() and the slope() of line between two points. Your two functions will be called inside **main( )** which accepts four floating numbers : x1, y1, x2, y2 (two points in x-y coordinates) as well as display the result showing the distance, slope, and whether the line is vertical, horizontal, or not.
2. Import appropriate C++ ***math*** library as well as your output should display the result with two decimal places.
3. Save this file as **distanceSlope62_yourLastnameInitial.cpp**

http://www.purplemath.com/modules/distform.htm

http://www.purplemath.com/modules/slope.htm

Distance Formula: Given the two points (x_1, y_1) and (x_2, y_2), the distance between these points is given by the formula:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

```
Enter x1: 2.0
Enter y1: 2.0
Enter x2: 5.0
Enter y2: 6.0
The distance is 5.0
The slope is: 1.33,neitehr vertical nor horizontal.
```

```
Enter x1: 3.0
Enter y1: 2.0
Enter x2: 3.0
Enter y2: -2.0
The distance is 4.0
The line is vertical.
```

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

Lab Exercise 6.3 Function-based Calculator

- Write 6 functions to operate basic arithmetic of two numbers such as
  1. Addition (+) // add(4,5)
  2. Subtraction (-)
  3. Multiplication (*)
  4. Division (/)
  5. Remainder (%)
  6. Your own formula (combination of basic arithmetic; point system in different games)
- Save as ‘‘**calculator63**_yourLastnameInitial**.cpp**’

```
Choose your math operation by typing an option number provided below.
Enter 0 to quit.
        1.addition
        2.subtraction
        3.multiplication
        4.division
        5.remainder
        6.My Magic Formula
       Your choice: 1
Enter two values seperated by a space for addition: 3 4
Addition of 3 and 4 is 7

Choose your math operation by typing an option number provided below.
Enter 0 to quit.
        1.addition
        2.subtraction
        3.multiplication
        4.division
        5.remainder
        6.My Magic Formula
       Your choice: 2
Enter two values seperated by a space for subtration: 9 2
Subtraction of 9 and 2 is 7
```

```
Choose your math operation by typing an option number provided below.
Enter 0 to quit.
        1.addition
        2.subtraction
        3.multiplication
        4.division
        5.remainder
        6.My Magic Formula
       Your choice: 9
This option is invalid , please try again or type "0" quit!


Choose your math operation by typing an option number provided below.
Enter 0 to quit.
        1.addition
        2.subtraction
        3.multiplication
        4.division
        5.remainder
        6.My Magic Formula
       Your choice: 6
Enter two values seperated by a space for addition: 5 6
Enter two values seperated by a space for subtration: 3 1
My magic math formula is  the product of add and subtract functions:
       11 x 2 is 22
```

```
Choose your math operation by typing an option number provided below.
Enter 0 to quit.
        1.addition
        2.subtraction
        3.multiplication
        4.division
        5.remainder
        6.My Magic Formula
       Your choice: 0
Done!!
```