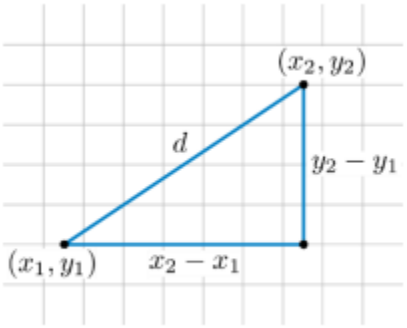
CSC 107 2.0 Introduction to Computer Programming

Tutorial 01

Answer the following questions using functions.

1. Calculate the distance between two points.
   You have two points (x1, y1) and (x2, y2). Following figure shows the calculation of distance. Prompt user to enter the coordinates of two points and print the distance.



2. Assume you have done 3 subjects and want to calculate the GPA. After calculating the GPA, print the grade student has obtained according to the following table. Using pointers.

$$GPA = \frac{\sum(Credit\ Value\ of\ the\ subject * number\ of\ credits\ obtained)}{Total\ Credits\ of\ the\ subject}$$

GPA (g)	Grade
$3.5 \leq g \leq 4.5$	1st class
$3.0 \leq g < 3.5$	2nd upper
$2.5 \leq g < 3.0$	2nd lower
$2.0 \leq g < 2.5$	pass
$0 \leq g < 2.0$	fail

3. Write a program to input two numbers and perform following operations.

   I. Add
   II. Subtract
   III. Multiply
   IV. Divide

4. Consider the following prototype of a function.

   void findTriangleProperties(float lenl, float len2, float len3, float *area, float *perimeter);

   The purpose of the function is to compute the area and perimeter of a triangle based on the lengths of the triangle.

   a) Identify the function name, return type, pass by value parameters and pass by reference parameters of the function.

   b) Write the definition of the function.

      Hint: Let a. b, and c be the lengths of the sides of a triangle. The perimeter and area are given by:

$$perimeter = a + b + c$$

$$area = \sqrt{s(s-a)(s-b)(s-c)}$$

$$where\ s = \frac{perimeter}{2}$$

   c) Write a program to compute the area and perimeter of a triangle using the function you defined in part (b) above. The program should allow the user to enter the lengths of three sides of the triangle and display the area and perimeter of the triangle.

      In addition to the function in part (b) (do not write again) write functions to read the lengths of the triangle, and, display the results on the screen.

      Your function to read the lengths should allow to enter the lengths of three sides of the triangle and check whether they form a triangle or not. If they do not form a triangle, print an appropriate error message and let the user to input again.

      The function to print the results, should format the results to two (2) decimal places and print the units of the measures.

      Hint: For a normal triangle, the sum of any two sides is greater than the third side.