

DEPARTMENT OF COMPUTER ENGINEERING
CMPE110: Fundamentals of Computing and Programming
EXPERIMENT 5

Introduction to C++ Programming: Functions

Objectives:

1) Understand how to edit, compile and execute C++ computer codes.

2) Understand C++ programming: Functions.

Note: Before solving any code-writing problems, you should do the following steps: **understand** and **analyze** the problem, develop an **algorithm** and/or **flowchart** for the solution, and finally **convert** the **algorithm** to a **computer code**.

1) Consider the following code which reads two integer numbers and find the sum of all integers between them:

```
#include<iostream>
#include<cmath>
using namespace std;
// function prototype
int Sum(int ,int )
// function definition
int Sum(int x,int y)
{
int S,i;
S = 0;
for (i = x; i <= y; i++)
    S+= i;
return S;
}
// main function
int main(){
int a,b,r;
cout << "Enter two integer numbers: ";
cin >> a >> b;
if (a>b)
    {min=b;
    max=a;}
else
    {min=a;
    max=b;}
// call the function Sum for execution
r=Sum(min,max);
cout << "The sum is " << r << endl;
system("pause");
return 0;}
```

a) Edit, compile and execute this code. Use the following input values: 8 5.

b) Modify the given code to find the product of all integers between the input numbers.

2) Consider the following program that reads the sides of a rectangle and one side of a square and then finds sum of their areas.

```
#include<iostream>
#include<cmath>
using namespace std;
// main function
int main(){
int area1,area2,sidea,sideb,tarea;
cout << "Enter the sides of a rectangles:";
cin >> sidea >> sideb;
area1=sidea*sideb;
cout << "Enter one side of a square:";
cin >> sidea ;
area2=sidea*sidea;
tarea=area1+area2;
cout << "The total area is " << tarea << endl;
system("pause");
return 0;}
```

Rewrite this program using one **Function called** (FindArea) and display the result in the main program. The function FindArea has the following prototype: **int Findarea(int ,int)**

3) It is required to calculate the letter grade of a student in CMPE110 course according to his total points as

80≤Total Point≤100	letter grade=A
70≤ Total Point <80	letter grade=B
60≤ Total Point <70	letter grade=C
50≤ Total Point <60	letter grade=D
Otherwise	letter grade=F

Write a computer code that will read the total point (**TotalPoint**) and then finds and prints the corresponding letter grade (**LetterGrade**). **Note:** Use a function subprogram to compute the letter grade, i.e., the function should receive the total point from the main program and it should return the letter grade to the main program. Use the following function prototype: **char LetterGradeComputation(int);**

4) Write a menu driven program with the following choices for a sub-menu items:

Enter 1 to Convert from Celsius to Fahrenheit:
Enter 2 to convert from Fahrenheit to Celsius:

Use a function Celsius which returns Celsius equivalent of a Fahrenheit temperature.

$$C = (F - 32) \times \frac{5}{9}$$

Use a function Fahrenheit which returns Fahrenheit equivalent of a Celsius temperature.

$$F = \frac{9}{5} \times C + 32$$