LAB 09

Summary

Items	Description
Course Title	Programming Fundamentals
Lab Title	Functions- Call by value
Duration	3 Hours
Operating System /Tool/Language	Visual Studio
Objective	To get familiar with use of functions in C++

Syntax:
//DECLARATION
type name (parameter1 , parameter2,….);

//DEFINTION
type name (parameter1, parameter2,….)
{ statement(s) }

//CALLING
name (parameter 1 , parameter2 ,…..);

A function is a group of statements that is executed when it is called from some point of the program.

The following is its format:

type name (parameter1, parameter2, ...)
{ statements }

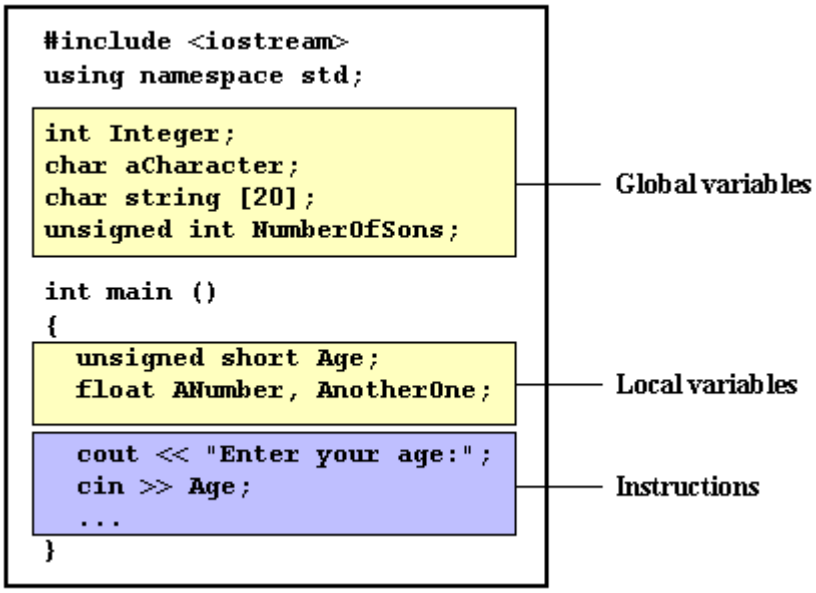
where:

- ***type*** is the data type specifier of the data returned by the function.
- ***name*** is the identifier by which it will be possible to call the function.
- ***parameters*** (as many as needed): Each parameter consists of a data type specifier followed by an identifier, like any regular variable declaration (for example: int x) and which acts within the function as a regular local variable. They allow to pass arguments to the function when it is called. The different parameters are separated by commas.

- ***statements*** is the function's body. It is a block of statements surrounded by braces { }.

Scope of Variables

The scope of variables declared within a function or any other inner block is only their own function or their own block and cannot be used outside of them. For example, in the previous example it would have been impossible to use the variables a, b or r directly in function main since they were variables local to function addition. Also, it would have been impossible to use the variable z directly within function addition, since this was a variable local to the function main.



Therefore, the scope of local variables is limited to the same block level in which they are declared. Nevertheless, we also have the possibility to declare global variables; These are visible from any point of the code, inside and outside all functions.

In order to declare global variables you simply have to declare the variable outside any function or block; that means, directly in the body of the program.

Sample program #01 :

```
#include "stdafx.h"
```

```
#include<iostream>
using namespace std;
void print(); // function declaration
void print() // function definition
{
  cout<<"i am in function"<<endl;
}

int _tmain(int argc, _TCHAR* argv[])
{      print();
       system("pause");
       return 0;
}
```

Sample program #02:

```
#include "stdafx.h"
#include<iostream>
using namespace std;
int sum(int,int); // function declaration
int sum(int x,int y) // function definition
{
  return x+y;
}

int _tmain(int argc, _TCHAR* argv[])
{ int a=10;
  int b=20;
  int z;
 z= sum(a,b); //function calling
 cout<<z;
 system("pause");
       return 0;
}
```

Sample program #03:

```
// pf9_3.cpp : Defines the entry point for the console application.
//

#include "stdafx.h"
#include<iostream>
using namespace std;
 int  sub(int x,int y)
  {   int z;
      z=x-y;
      return z;      }

int _tmain(int argc, _TCHAR* argv[])
{
       int a=20,b=10,c=5,d,e,f;
      d=sub(a,b);
      cout<<"result of first subtraction is "<<d<<endl;
      e=sub(20,10);
      cout<<"result of second subtraction is "<<e<<endl;
```

```
        cout<<"result of third subtraction is "<<sub(20,10)<<endl;
        f=10+sub(a,10);
        cout<<"10 +  result of subtraction is " <<f<<endl;
           system("pause");
         return 0;
}
```

LAB TASKS

TASK # 01

Compile all sample programs and observe the output of each code to get familiar with the syntax

TASK # 02

Give answers to the following.

1.	Write the declartion of a function named: power, to compute x^n.
2.	Call the function: int factorial(int) ;

3.	Which of these are valid function declarations:
	a. void function();
	b. void function(void);
	c. void function(int);
	d. function(int);
	e. int function();

Task 2 :

Write the output of the following code fragments.

1.	`int square(int);`
	`int main()`
	`{`

```
        for(int i=0;i<10;i+=2)
                cout << square(i) << endl;

           return 0;
}
int square(int a)
{
        return a*a;
}
```

Output:

2.

```
int minimum(int,int);
int main()
{
        int x=10,y=5;
        int m = minimum(x,y);
        cout<<m<<endl;
        return 0;
}
int minimum(int a,int b)
{
        if (a<b)
                return a;
        else
                return b;
}
```

Output:

3.

```
void increment(int);
int main()
{

        int x=10;
        cout<< x <<endl;
        increment(x);
        cout<< x <<endl;
        return 0;
}
void increment(int x)
{
        x++;
        cout<< x <<endl;
}
```

Output:

TASK # 03

Create a function which display your Name , Reg no, Class, Section.
Display all the things within the body of function, call the function in main.

TASK # 04

Create a function SUM in C++ which calculates and return the sum of 5 numbers entered by user.

TASK # 05

Create a function is_even which take a number as argument, return TRUE if number is even.
Take number from user at run time.