Functions

Program No. 1

```
#include<iostream.h>
void draw( );
main(  )
{
        draw( );
        draw( );
}
void draw( )
{
        cout<<"Beni-Suef University "<<endl;
        cout <<"Faculty of Computers and Information System"<<endl;
}
```

==========

Program No. 2

```
#include <iostream.h>
int addition (int a, int b)
{
  int r;
  r=a+b;
  return (r);
}
main ( )
{
  int z;
  z = addition (5, 3);
  cout << "The result is " << z <<endl;
}
```

==========

Program No. 3

```
#include <iostream.h>
int addition (int a, int b)
{
  int r;
  r=a+b;
  return  r;
```

```
}
main ( )
{
  int z, a, b;
  cout<<"Enter first value :" ;
  cin>>a;
  cout<<"Enter second value :" ;
  cin>>b;
  z = addition (a, b);
  cout << "The sum is " << z <<endl;
}
```

==========

Program No. 4

```
#include<iostream.h>
const float  pi=3.14;
float area(float r);
float circum(float r);
void main( )
{
        float radius;
        float a,b;
        cout<<"Enter the value of the radius : ";
        cin>>radius;
        a=area(radius);
        b=circum(radius);
        cout<<"The area = "<<a<<endl;
        cout<<"The circum = "<<b<<endl;
}
float area(float x)
{
        float m;
        m=pi*x*x;
        return m;
}
float circum(float y)
{
        float n;
```

```
        n=2*pi*y;
        return n;
}
```

==========

Program No. 5

```
#include <iostream.h>
int addition (int a, int b)
{
  int r;
  r=a+b;
  return (r);
}
int subtraction (int a, int b)
{
  int r;
  r=a-b;
  return (r);
}
int multiplication (int a, int b)
{
  int r;
  r=a*b;
  return (r);
}
float division (float a, float b)
{
  float r;
  r=a/b;
  return (r);
}
main ()
{  int z1,z2,z3,a,b;
  float z4;
  cout<<"Enter first value :" ;
  cin>>a;
  cout<<"Enter second value :" ;
  cin>>b;
```

```
  z1 = addition (a,b);
  z2 = subtraction (a,b);
  z3 = multiplication (a,b);
  z4 = division (a,b);
  cout << "The sum is " << z1 <<endl;
  cout << "The subtraction is " << z2 <<endl;
  cout << "The multiplication is " << z3 <<endl;
  cout << "The division is " << z4 <<endl;
  }
```

==========

Program No. 5

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

void duplicate (int& a, int& b, int& c)
{
  a*=2;
  b*=2;
  c*=2;
}
main ()
{
  int x=1, y=3, z=7;
  duplicate (x, y, z);
  cout << "x=" << x << ", y=" << y << ", z=" << z <<endl ;
  }
```

==========

Program No. 6

```
#include <iostream>
void prevnext (int x, int& prev, int& next)
{
  prev = x-1;
  next = x+1;
}
main ( )
{
```

```
  int x=100, y, z;
  prevnext (x, y, z);
  cout << "Previous=" << y << ", Next=" << z << endl;
  }
```

==========

Program No. 7

```
#include <iostream.h>
int divide (int a, int b=2)
{
  int r;
  r=a/b;
  return (r);
}
int main ()
{
  cout << divide (12);
  cout << endl;
  cout << divide (20,4);
  cout << endl;
  return 0;
}
```

==========

Program No. 8

```
// factorial calculator
#include <iostream.h>
long factorial (long a)
{
  if (a > 1)
   return (a * factorial (a-1));
  else
   return 1;}
 main ( )
{
  long number;
  cout << "Please type a number: ";
  cin >> number;
  cout << number << "! = " << factorial (number)<<endl; }
```

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Sheet No.4

Due Date: One week after your lab session- Complete by yourself.

Exercise 1:

Write a C++ program to calculate the area of **Triangle** , using a function

(hint: Area = $\sqrt{S(S-edge1)(S-edge2)(S-edge3)}$,

where $S = (edge1 + edg2 + edge3) \,/\, 2$)

==========

Exercise 2:

Write a C++ program to accept 2 numbers from the users and add 2 to the 1st and multiply the 2nd by 2, using only one function.

==========

Exercise 3:

Write a C++ program to calculate $C_r^n = \frac{n!}{r!\,(n-r)!}$ **using a function.**

==========

Exercise 4:

Write a function to reads a sequence of integers,. Count how many even and odd numbers there are, ignoring all numbers that are less than 1, and print these counts in main part.

For example: *with input 7 25 100 2 -6 1 0 3, the output should be*:

Even = 2, odd = 4

There were 2 even numbers, 4 odd numbers, and 2 numbers were ignored.

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Exercise 5:

Write a C++ program to accept two numbers from the user and calculates their sum and the factorial of the first using only one function.

==========

Exercise 6:

Write a function named "sum_from_to" that takes two integer arguments, call them "first" and "last", and returns as its value the sum of all the integers between first and last inclusive.

Thus, for example,

```
cout << sum_from_to(4,7) << endl;          // will print 22 because 4+5+6+7 = 22
cout << sum_from_to(-3,1) << endl;         // will print -5 'cause (-3)+(-2)+(-1)+0+1 = -5
cout << sum_from_to(7,4) << endl;          // will print 22 because 7+6+5+4 = 22
cout << sum_from_to(9,9) << endl;          // will print 9
```

==========

Exercise 7:

Write a function named "g_c_d" that takes two positive integer arguments and returns as its value the greatest common divisor of those two integers. If the function is passed an argument that is not positive (i.e.,

greater than zero), then the function should return the value 0 as a sentinel value to indicate that an error occurred. Thus, for example,

```
cout << g_c_d(40,50) << endl;              // will print 10
cout << g_c_d(256,625) << endl;            // will print 1
cout << g_c_d(42,6) << endl;               // will print 6
cout << g_c_d(0,32) << endl;               // will print 0 (even though 32 is the g.c.d.)
cout << g_c_d(10,-6) << endl;              // will print 0 (even though 2 is the g.c.d.)
```

==========

Exercise 8:

Write a function named "swap_floats" that takes two floating point arguments and interchanges the values that are stored in those arguments. The function should return no value. To take an example, if the following code fragment is executed

float x = 5.8, y = 0.9;

swap_floats (x, y);

cout << x << " " << y << endl;

then the output will be

0.9 5.8

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Exercise 9:

Write a C++ program to print the smaller of two numbers entered by the user (using a function).

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Exercise 10:

Write a program to check the number if is even or odd (hint: get the number from the user) by using function.