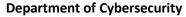كلية العلوم

قسم الأمن السيبراني

Lecture: 5

The function

Subject: Structured Programming
First Stage
Lecturer: Asst. Prof. Dr. Ali Kadhum Al-Quraby

Ex 12:

- Write a C++ program to find the maximum numbers between two numbers.

```cpp
#include <iostream.h>
// function declaration
int max(int,int);
int main ()
{
    int a,b,ret;
    cout<<"Enter value of a:";
    cin>>a;
    cout<<"Enter value of b:";
    cin>>b;
     // calling a function.
    ret = max(a, b);
    cout << "Max value is : " << ret << endl;
    return (0);
}
// function definition
int max(int num1, int num2)
{
     int result;
    if (num1 > num2)
            result = num1;
    else
            result = num2;
    return (result);
}
```

Output
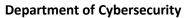
Enter value of a:20
Enter value of b:1

Ex 13:

– Write a C++ program to read the integer number. After that, check whether the number is odd or even. If the number is even, increment it by one else decrement it by one. Using function to do that.

```cpp
#include <iostream.h>
// function declaration
int odd_even(int);
void main ()
{
    // local variable declaration:
    int number,indicator,result=0;
    cout<<"Enter the number:";
    cin>>number;
    // calling a function.
    indicator = odd_even(number);
    if (indicator==1)
    {
            cout<<"The number:"<<number<<" is Even So, it will be
incremented by 1";
            number=number+1;
    }
    else
    {
            cout<<"The number:"<<number<<" is Odd So, it will be
decremented by 1";
            number=number-1;
    }
    cout<<endl;
    cout<<"The number after changing is:"<<number;
}
```

Output 1

Enter the number:11

The number:11 is Odd So, it will be decremented by 1

Output 2

Enter the number:14

The number:14 is Even So, it will be incremented by 1

```
    // Function definition
    int odd_even(int a)
    {
        int result=0;
        if (a%2==0){
                result = 1;
        }
        return (result);
    }
```

Ex 14:

– Write a C++ program to do the following activities: –

1- Printing greeting phrase.

2- Reading some numbers.

3- Checking whether the entered number is odd or even.

4- Storing the odd and even numbers in the separated arrays.

5- Printing the numbers of two arrays.

The above activities must be written with function.

```
#include <iostream.h>
#include <conio.h>
// function declaration
// type (1)
void print_hello();
// type (2)
int enter_num();
// type (3)
void print_elements_of_array(int);
// type (4)
int chk_positive_negative(int);
int main ()
{
        int new_number,count,flag;
```

Output

Hello students

Enter the number of numbers:5

Enter the number:1

The number 1 is Positive

Enter the number:2

The number 2 is Positive

Enter the number:9

The number 9 is Positive

Enter the number:-1

```cpp
int po[5],ne[5],n=0,p=0,i;
// calling a function(type (1)).
print_hello();
cout<<endl;
cout<<"Enter the number of numbers:";
cin>>count;
for (i=0;i<count;i++){
        // calling a function(type (2)).
        new_number=enter_num();
        // calling a function(type (4)).
         flag=chk_positive_negative(new_number);
        if (flag==1)
        {
                po[p]=new_number;
                p=p+1;
        }
        else
        {
                ne[n]=new_number;
                n=n+1;
        }
}
cout<<"Positive elements";
cout<<endl;
for (i=0;i<p;i++){
        // calling a function(type (3)).
        print_elements_of_array(po[i]);
        cout<<" ";
}
cout<<endl;
cout<<"Negative elements";
cout<<endl;
for (i=0;i<n;i++){
```

```cpp
                print_elements_of_array(ne[i]);
                cout<<" ";
        }
        getch();
        return (0);
}
// Function definition
void print_hello()
{
        cout<<"Hello students";
}
int enter_num()
{
        int number;
        cout<<"Enter the number:";
        cin>>number;
        return(number);
}
int chk_positive_negative(int a)
{
        int sensor;
        if (a>=0)
        {
                cout<<"The number "<<a<<" is Positive";
                sensor=1;
        }
        else
        {
                cout<<"The number "<<a<<" is Negative";
                sensor=2;
        }
        cout<<endl;
        return (sensor);
```

```
}
void print_elements_of_array(int current_element)
{
        cout<<current_element;
}
```

Homework:

1. **Rewrite the following C++ program by using function.**

#include<iostream.h>

void main ( )

```
{   int n; float f; char c;

    cin<< n;

    cin>>f;

    cin<< c ";

  cout<<" The Integer Number is "<<n ;

  cout<<" The Real Number is "<<f  ;

  cout<<" The Character is "<<c ;

}
```
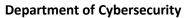
Output

23
34.87
A
The Integer Number is 23

2. **Rewrite the following C++ program using function.**

   #include<iostream.h>

   void main( )

Output

```
{
    float  pi = 3.14; int r; float c;
    cout << "Enter the radius of a circle: "; cin>>r;
    c = r * r * pi;
    cout << "The area of a circle is:  " << c;
}
```

Enter the radius of a circle: 5

The area of a circle is: 78.5

3. Write a C++ program to read and print your first name, your age, and your city using function.

4. Write a C++ program to read a student degree, and check if it's degree greater than or equal to 50, then print pass, otherwise print fail. Do that with function.

5. Write a C++ program to read a number and print the day of the week using function.

6. Write C++ program to compute the value of Z according to the following equations using function.

$$Z = \begin{cases} x + 5 & : x < 0 \\ x + 4 & : x = 0 \\ x - 11 & : x > 0 \end{cases}$$

7. Rewrite the following C++ program using function.
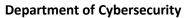
```
#include <iostream.h>

#include <conio.h>

int main()

{

    int i;
```

Output

1 2 3 4 5

```
        i=1;

        while (i <= 5) {

            cout << i << " ";

             i=i+1;

        }

        getch();

        return (0);

    }
```

8. Write a C++ program to find the summation between 0 and 6 using function.
9. Write a C++ program to solve the following equation using function.

$$\sum_{i=1}^{n} i^2 = 1^2 + 2^2 + 3^2 + \cdots + n^2$$

10. Write a C++ program to find the summation of student's marks and it's average, assume that the student has 4 marks. Do that using function.
11. Write a C++ program for displaying the even numbers between 0 and 8 using function.
12. Write a C++ program to solve the following equation (using function): –

$$sum = \sum_{i=1}^{4} a_i^2$$

13. Write a C++ program to read 4 integer numbers and find the sum of positive number only using function.
14. Write a C++ program to print the following series: 1, 2, 4, 8, 16, 32, 64 using

function.

15. Write a C++ program to print the following figure using function.

```
+

+ +

+ + +

+ + + +

+ + + + +
```