Lecture (4)
'' Programming Essentials in C++ ''

Presented by : Dr. Nehal El Azaly

If Statement

- If statement : used to execute a piece of code based on a condition.

- Condition: it's a boolean expression means (true or false).

```
1  if (/* الشرط */)
2  {
3       // تعليمات التي يتم تنفيذها إذا كان الشرط صحيحا
4  }
```

If Statement (Symbols)

Symbol	purpose
==	Equal
>	Greater than
<	less than
>=	Greater than or equal
<=	less than or equal
&&	And
||	Or
!=	Not equal

Example on (If Statement)

```cpp
8    *****************************************************
9    #include <iostream>
10
11   using namespace std;
12
13   int main()
14   {
15       int a=10;
16       if(a==10)
17       {
18           cout<<"a is less thn 20\n";
19       }
20
21       return 0;
22   }
```

```
a is less thn 20
```

Else if Statement

- The instructions **if & else** allow execution the decision between **two choices**.

- If you want to select option between **three choices** or more you can use the instruction of **else if** instead of sequential series (repetition) of if statements.

If & Else if conditions

```cpp
8
9   #include <iostream>
10
11  using namespace std;
12
13  int main()
14  {
15      int a=10;
16      if(a==10)
17      {
18          cout<<"a is less thn 20\n";
19      }
20      else if (a==11)
21      {
22          cout<<"value of a is 11"<<endl;
23      }
24
25      return 0;
```

```
a is less thn 20
```

```cpp
using namespace std;

int main()
{
    int a=10;
    int z=12;
    if(a==10)
    {
        cout<<"a is less thn 20\n";
    }
    else if (a==11)
    {
        cout<<"value of a is 11"<<endl;
    }
    else if (z=12)
    {
        cout<<"value of z is 12"<<endl;
    }


    return 0;
}
```

```
a is less thn 20
```

Example on (If & else Statements)

```cpp
int main()
{
    int a=10;
    int z=12;
    if(a==0)
    {
        cout<<"a is less thn 20\n";
    }
    else if (a==0)
    {
        cout<<"value of a is 11"<<endl;
    }
    else if (z=0)
    {
        cout<<"value of z is 12"<<endl;
    }
    else
    {
        cout<<"good bye";
    }
```

```
good bye
```

```cpp
 8      *********************************************
 9      #include <iostream>
10
11      using namespace std;
12
13      int main()
14      {
15          int x=10;
16
17          if(x>=2)
18          {
19              cout<<"x is greater than two \n";
20          }
21
22          else
23          {
24              cout<<"thank you"<<endl;
25          }
26          return 0;
27      }
```

x is greater than two

Check whether number is even or odd

```cpp
1  //Check Whether Number is Even or Odd using if else
2  using namespace std;
3
4  int main()
5  {
6
7      2 4 6 8 10
8      1 3 5 |
9
10
11
12     return 0;
13 }
```

Check if the number accepts the division on two

Check whether number is even or odd

```cpp
8      *********************************************************
9      #include <iostream>
10
11     using namespace std;
12
13     int main()
14     {
15         int num;
16         cout<<"enter a number\n";
17         cin>>num;
18         if(num%2==0)
19         {
20             cout<<num <<" num is even"<<endl;
21         }
22         else
23         {
24             cout<<num <<"num is odd"<<endl;
25         }
26
27         return 0;
28     }
```

```
enter a number
10
10 num is even
```

```cpp
/************************************************
#include <iostream>

using namespace std;

int main()
{
    int num;
    cout<<"enter a number\n";
    cin>>num;
    if(num%2==0)
    {
        cout<<num <<" num is even"<<endl;
    }
    else
    {
        cout<<num <<"num is odd"<<endl;
    }

    return 0;
}
```

```
enter a number
17
17num is odd
```

```cpp
7
8    ********************************************************
9    #include <iostream>
10
11   using namespace std;
12
13   int main()
14   {
15       int num;
16       cout<<"enter a number\n";
17       cin>>num;
18       if(num%2==0)
19       {
20           cout<<num <<" num is even"<<endl;
21       }   else
22       {
23           cout<<num <<"num is odd"<<endl;
24       }
25
26
27       return 0;
28   }
```

```
enter a number
0
0 num is even
```

Check if this right or not??

```cpp
       **************************************************
#include <iostream>

using namespace std;

int main()
{
    int num;
    cout<<"enter a number\n";
    cin>>num;
    if(num!=0)          1    ← 1
    {
    if(num%2==0)
    {
        cout<<num <<" num is even"<<endl;
    }   else
    {
        cout<<num <<"num is odd"<<endl;
    }
    }                ← 2
    else
    {
        cout<<"this number is 0";
    }
    return 0;
}
```

```
enter a number
0
this number is 0
```

For loop

❖ **What's a loop?**

- In programming, a loop is used to repeat a block of code until the specified condition is met.

- **Types:** 1) for 2) while 3) do while

Syntax:

```
1  for(initialization; condition test; increment or decrement)
2  {
3  //block of code to be executed repeatedly
4  }
```

For loop to repeat a statement

```cpp
7
8  ********************************************************
9  #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     for(int i=1;i<=5;i++)
16     {
17         cout<<"Hello c++"<<endl;
18     }
19
20     return 0;
21 }
```

```
Hello c++
Hello c++
Hello c++
Hello c++
```

For loop to count numbers up

```cpp
#include <iostream>

using namespace std;

int main()
{
    for(int i=1;i<=10;i++)
    {
        cout<<i<<endl;
    }

    return 0;
}
```

```
1
2
3
4
5
6
7
8
9
10
```

For loop to count numbers down

```cpp
        ********************************************************
#include <iostream>

using namespace std;

int main()
{
    for(int i=5;i>=0;i--)
    {
        cout<<i<<endl;
    }

    return 0;
}
```

```
5
4
3
2
1
0
```

While Statement

- While statement : used to execute a piece of code based on a condition.

- Condition: it's a boolean expression means (true or false).

Example on While Statement

```cpp
       ****************************************
   9   #include <iostream>
  10
  11   using namespace std;
  12
  13   int main()
  14   {
  15       int i=1;
  16       while(i==1)
  17       {
  18           cout<<"Hi"<<endl;
  19           i++;
  20       }
  21       return 0;
  22   }
```

```
Hi
```

Do While Statement

Example on do While Statement

```cpp
8    ***************************************
9    #include <iostream>
10
11   using namespace std;
12
13   int main()
14   {
15       int i=1;
16       do
17       {
18       cout<<"hello"<<endl;
19       i++;    //i=2
20       }
21       while(i==1);
22       return 0;
23   }
```

```
hello
```

Example on do While Statement

```cpp
8      ************************************
9      #include <iostream>
10
11     using namespace std;
12
13     int main()
14     {
15         int i=1;
16         do
17         {
18         cout<<"hello"<<endl;
19         i++;      //i=2
20         }
21         while(i==2);
22         return 0;
23     }
```

```
hello
hello
```