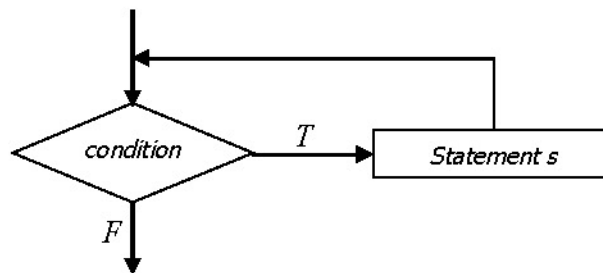
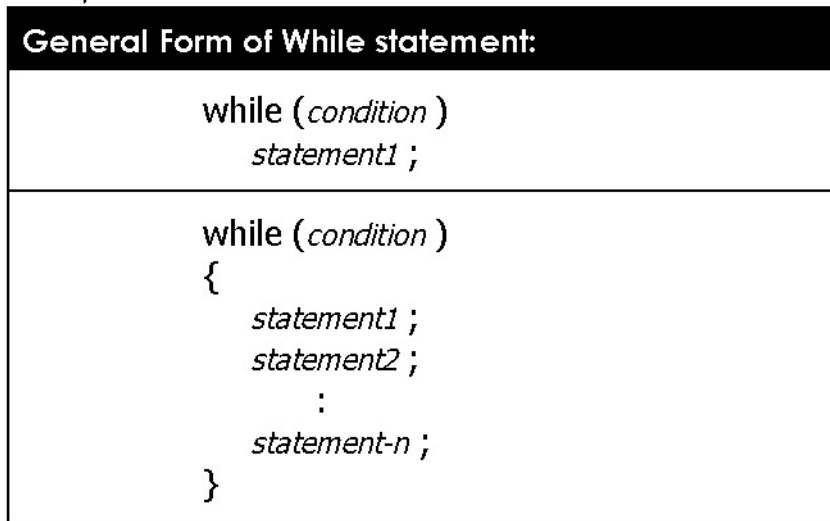


LECTURE 8

1. Loop Statements:

The loop statements are essential to construct systematic block styled programming. C++ provides three iteration structures: **while**, **do/while**, and **for**.

2. While Repetition Structure:



The condition represents the value of a variable, unary or binary expression, and a value returned by a function.

Example `i = 0;`
1: `while (i < 10)`
 `{`
 `cout << i;`
 `i ++;`
 `}`

Output:
0 1 2 3 4 5 6 7 8 9
i=10

Example 2:

```

i = 0;
while ( i < 10 )
{
    cout << i;
    i += 2;
}

```

Output: *even numbers only*
0 2 4 6 8
i=10

Example 3:


```

i = 1;
while ( i < 10 )
{
    cout << i;
    i += 2;
}

```

Output: *odd numbers only*
1 3 5 7 9
i=11

Example 1

 Write C++ program to find the summation of the following series:

$$\text{sum} = 1 + 3 + 5 + 7 + \dots + 99$$


(in other words: find the summation of the odd numbers, between 0 and 100)

```

#include<iostream.h>
void main( )
{
    int count = 1;
    int sum = 0;
    while ( count <= 99 )
    {
        sum = sum + count;
        count = count + 2;
    }
    cout << "sum is: " << sum << endl;
}

```

Example 2

 Write C++ program to find the cub of a number, while it is positive:

```

#include<iostream.h>
void main( )
{
    int num, cubenum;
    cout << "Enter positive number \n";
    cin >> num;
    while ( num > 0 )
    {
        cubenum = num * num * num;
        cout << "cube number is : " << cubenum << endl;
    }
}

```

```
    cin >> num;
}
```

Example 3



Write C++ program to find the summation of the following series:

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

```
#include<iostream.h>
void main( )
{
    int i = 1, n ,sum = 0;
    cout << "enter positive number";
    cin >> n;
    while ( i <= n )
    {
        sum += i*i;
        i++;
    }
    cout << "sum is: " << sum << endl;
}
```

Example 4



Write C++ program to find the summation of student's marks, and it's average, assume the student have 8 marks:

```
#include<iostream.h>
void main( )
{
    int mark, i, sum = 0;
    float av = 0;
    i = 1;
    while ( i <= 8 )
    {
        cout << "enter mark: ";
        cin >> mark;
        sum = sum + mark;
        i++;
    }
    cout << "sum is: " << sum << endl;
    av = sum / 8;
    cout << "average is: " << av;
}
```

Example 5



Write C++ program that display the following board pattern:

```
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
```

```
#include<iostream.h>
void main( )
{
    int row = 8, column;
    while ( row-- > 0 )
    {
        column = 8;
        if ( row % 2 == 0 )
            cout << " ";
        while ( column-- > 0 )
            cout << "*";
        cout << '\n';
    }
}
```

Example 6

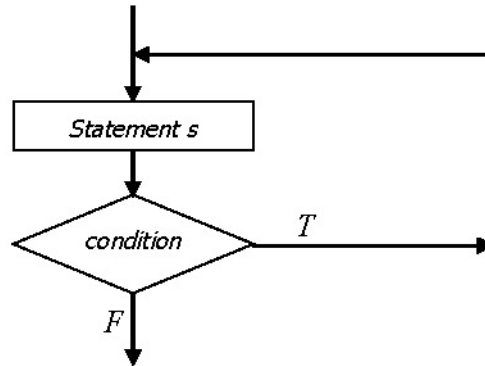


Write C++ program to check for a line feed and tab of a given character:

```
#include<iostream.h>
void main( )
{
    Char ch;
    Cout<<"enter a line \n";
    Ch=cin.get();
    While (ch!='\n' && ch!='\t')
    { cout.put(ch);
      Ch=cin.get(); }
}
```

3. Do / While Statement:

General Form of Do / While statement:
<pre>do statement1 ; while (condition);</pre>
<pre>do { statement1 ; statement2 ; : statement-n ; } while (condition);</pre>



Example 1:

```
i = 0;
do
{
    cout << i;
    i++;
}
while ( i < 10 )
```

Output:

```
0 1 2 3 4 5 6 7 8 9
i=10
```

Example 2:


```
i = 0;
do
{
    cout << i;
    i += 2;
}
while ( i < 10 )
```

Output:

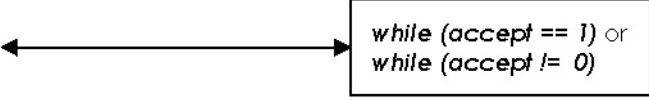
```
0 2 4 6 8
i=10
```

even numbers only

Example 7


 Write C++ program to valid input checking, that accept the numbers between 50 ... 70 only:

```
#include<iostream.h>
void main( )
{
    int accept = 1;
    int x, low = 50, high = 70;
    do
    {
        cout << "enter number: ";
        cin >> x;
        if ( x >= low && x <= high )
            accept = 1;
        else
            accept = 0;
    }
    while ( ! accept );
```



*while (accept == 1) or
while (accept != 0)*

Example 8

 Write C++ program to find the summation of student's marks, and it's average, assume the student have 8 marks:

```
#include<iostream.h>
void main( )
{
    int mark, i, sum = 0;
    float av = 0;
    i = 1;
    do
    {
        cout << "enter mark: ";
        cin >> mark;
        sum = sum + mark;
        i++;
    }
    while ( i <= 8 )
    cout << "sum is: " << sum << endl;
    av = sum / 8;
    cout << "average is: " << av;
}
```

Example 9



Write C++ program to find the factorial of n:

$$n! = n * n-1 * n-2 * n-3 * \dots * 2 * 1$$

```
#include<iostream.h>
void main( )
{
    int n, f = 1;
    cout << "enter positive number: ";
    cin >> n;
    do
    {
        f = f * n;
        n --;
    }
    while ( n > 1 );
    cout << "factorial is: " << f;
}
```

Example 10



Write C++ program to find the summation of even numbers

```
#include<iostream.h>
void main( )
{
    int max,sum,digit;
    digit=2;
    cout << "enter a number: ";
    cin >> max;
    sum=0;
    do
    {
        Sum=sum+digit;
        Digit+=2;
    }
    while ( digit<=max );
    cout << "2+4+...=" << max << "sum=" << sum << endl; }
}
```