

LECTURE 6

1. Selection Statements:

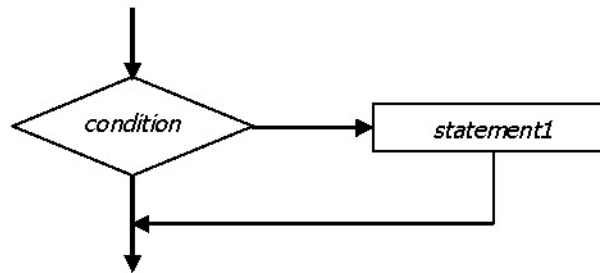
Conditional expressions are mainly used for decision making. C++ provides multiple selection structures: **if**, **if/else**, **else if**, **nested if** and **switch**.

2. The Single If Statement Structure:

The IF statement is used to express conditional expression. If the given condition is true then it will execute the statements; otherwise it will execute the optional statements.

General Form of single-selection If statement:

```
if ( expression or condition ) statement1 ;
```




Example 1: if (avrg >= 3.5)
 cout << "good";

Example 2: if (x > 0.0)
 sum += x;

Example 3: cin >> num;
 if (num == 0)
 zcount = zcount + 1;

Example 1

 Write a C++ program to read any two numbers and print the largest value of it:

```
#include<iostream.h>
void main( )
{
    Float x,y;
    Cout<<"Enter any two numbers\n";
    Cin>>x>>y;
    If (x>y)
    Cout << "largest value is"<<x<<endl;
}
```


3. The Single Block If Statement Structure :

The block IF statement are enclosed in ({} and {}) to group declaration and statements into a compound statement or a block. These blocks are always considered as a single statement. The structure is:

General Form of single block selection If statement:

```
if ( expression or condition )
{
    statement1 ;
    statement2 ;
    statement3 ;
}
```

Example 2

 Write a C++ program to read a number and check if it's positive, if it's so print it, add it to a total, and decrement it by 2:

```
#include<iostream.h>
void main( )
{
    int num, total=0;
    cin >> num;
    if ( num >= 0 )
    {
        cout << num <<" is a positive";
        total += num;   num = num - 2;
    }
}
```

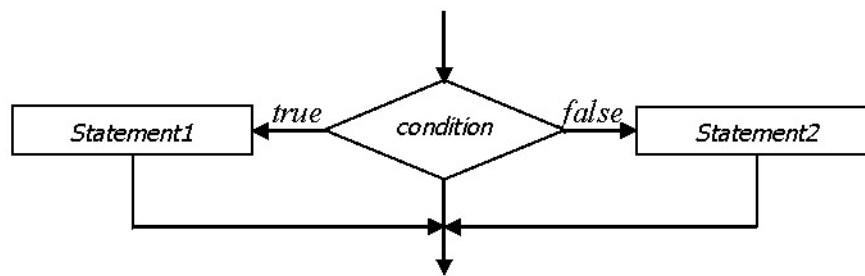
General Form of If/else statement:

```
if ( expression )  
    statement1 ;  
else statement2 ;
```

```
if ( expression )  
    { statements }  
else { statements }
```

4. The If/else Statement Structure:

The IF structure is



In this case, either of the two statements are executed depending upon the value of the expression. Note that there is a semicolon after each of the statement but not after the IF expression. Note that the else statement without braces leads to **confusion** so:


```
If (i>j) { If (a>b)  
temp=a;  
}  
Else  
temp=b;
```

Example 1:

```
cin >> value;  
if ( value >= 0 )  
    cout << "positive";  
else  
    cout << "negative";
```


Example 2: cin >> num1 >> num2;
 if (num1 > num2)
 cout << num1;
 else
 cout << num2;

Example 3

 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:

```
#include<iostream.h>
void main( )
{
    int degree;
    cin >> degree;
    if (degree >= 50 )
        cout << "pass";
    else
        cout << "fail";
}
```

Example 4

 Write a C++ program to read a number, and check if it's even or odd:

```
#include<iostream.h>
void main( )
{
    int num;
    cin >> num;
    if ( num %2 == 0 )
        cout << "even";
    else
        cout << "odd";
}
```

5. Else if Statements:


General Form of else if statement:

```
if ( expression or condition 1 ) statement1 ;  
else if ( expression or condition 2 ) statement2 ;  
else if ( expression or condition 3 ) statement3 ;  
:  
else if ( expression or condition n ) statement-n ;  
else statement-e ;
```

Example 1:


```
if ( value == 0 ) cout << "grade is A";  
else if ( value == 1 ) cout << "grade is B";  
else if ( value == 2 ) cout << "grade is C";  
else cout << "grade is X";
```

Example 5

 Write a C++ program to read a number, and print the day of the week:

```
#include<iostream.h>  
void main( )  
{  
    int day;  
    cin >> day;  
    if ( day == 1 ) cout << "Sunday";  
    else if ( day == 2 ) cout << "Monday";  
    else if ( day == 3 ) cout << "Tuesday";  
    else if ( day == 4 ) cout << "Wednesday";  
    else if ( day == 5 ) cout << "Thursday";  
    else if ( day == 6 ) cout << "Friday";  
    else if ( day == 7 ) cout << "Saturday";  
    else cout << "Invalid day number";  
}
```

Example 6

 Write C++ program to compute the value of Z according to the following equations:

$$Z = \begin{cases} x + 5 & : x < 0 \\ \cos(x) + 4 & : x = 0 \\ \sqrt{x} & : x > 0 \end{cases}$$

```
#include<iostream.h>
void main( )
{
    int Z, x;
    cout << "Enter X value \n";
    cin >> x;
    if ( x < 0 ) Z= x + 5;
        else if ( x == 0 ) Z= cos(x) + 4;
            else Z= sqrt(x);
    cout << "Z is " << Z;
}
```

6. Nested If Statements:

Some of the samples of **NESTED if-else** constructions are shown below:

<pre>If (exp.) { Statements } Else { Statements }</pre>	<pre>If (exp.) { If (exp.) {Statements} Else { Statements} } Else {Statements}</pre>	<pre>If (exp.) { If (exp.) {Statements} Else { Statements} } Else {If (exp) {Statements} Else {Statement} }</pre>
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Example 7



Write C++ program to find a largest value among three numbers:

```
#include<iostream.h>
void main( )
{
#include<iostream.h>
void main( )
{
Float x,y,z;
Cout<<"Enter any two numbers\n";
Cin>>x>>y,z;
If (x>y) {
If (x>z)
Cout << "largest value is"<<x<<endl;
Else
Cout << "largest value is"<<z<<endl;
}
Else If (y>z)
Cout << "largest value is"<<y<<endl;
Else
Cout << "largest value is"<<z<<endl;
}
}
```