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C++ Programming
Making Decisions

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Decisions Using "If" Statements

Source: Learn C++ Programming Language, TutorialsPoint, 2014

Comparators

The following comparators can be used in the condition part of an If statement.

<	less than
>	greater than
==	equal to
<=	less than or equal to
>=	greater than or equal to
!=	not equal to

Boolean Operators

The following Boolean operators can be used in the condition part of an If statement.

And	&&
Or	
Not	!

If Statement

An if statement consists of a boolean (true or false) expression followed by one or more statements.

```
if(boolean_expression)
{
    // statement(s) will execute if the
    // boolean expression is true
}
```

Example:

```
if(myTemp <= 0)
{
    cout << "Temperature is freezing.";
}
```

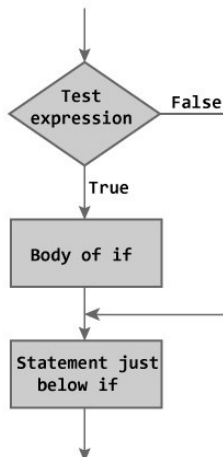


Figure: Flowchart of if Statement

If-Else Statement

An if statement can be followed by an optional else statement, which executes when the boolean expression is false.

```
if(boolean_expression)
{
    // statement(s) will execute if the
    // boolean expression is true
}
else
{
    // statement(s) will execute if the
    // boolean expression is false
}
```

Example:

```
if(myTemp <= 0)
{
    cout << "Temperature is 0 or below.";
}
else
{
    cout << "Temperature is above 0.";
}
```

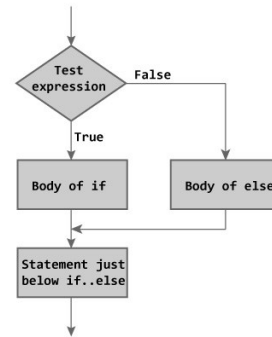


Figure: Flowchart of if...else Statement

Examples of "If" Statements

Example: Even or odd?

Use the % (modulo) operator which returns the remainder from division. If you divide a number by 2 and there is no remainder, then the number is even.

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

int main(int argc, char** argv)
{
    int myNum;

    cout << "Please enter a number: ";
    cin >> myNum;

    if(myNum%2 == 0)
    {
        cout << "That number is even.";
    }
    else
    {
        cout << "That number is odd.";
    }

    return 0;
}
```

Example: Teenager?

Is the person a teenager (ages between 13 and 19)?

```
int age;

if(age >= 13 && age <= 19)
{ cout >> "You are a teenager!"; }
```

Example: Movie Discount?

The movie theatre offers a discount for people that are 12 and under and also to people who are 65 or older.

```
int age;

if(age <= 12 || age >= 65)
{ cout >> "You get a discount!"; }
```

Decisions Using "Switch" Statements

A switch statement allows a variable to be tested for equality against a list of values. Each value is called a case, and the variable being switched on is checked for each case.

Note that switch only works with variables that can be represented by integers. You can switch on ints, chars and colors, but not doubles, strings or conditions.

```
switch(expression)
{
    case constant-expression :
        statement(s);
        break; //optional

    case constant-expression :
        statement(s);
        break; //optional

    // you can have numerous case statements

    default : //Optional
        statement(s);
}
```

Example:

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

int main ()
{
    // local variable declaration:
    char grade = 'D';

    switch(grade)
    {
        case 'A' :
            cout << "Excellent!";
            break;

        case 'B' :
            cout << "Very Good";
            break;

        case 'C' :
            cout << "Well done";
            break;

        case 'D' :
            cout << "You passed";
            break;

        case 'F' :
            cout << "Better try again";
            break;

        default :
            cout << "Invalid grade";
    }

    return 0;
}
```

