



Programming Fundamentals with C++

Lecture 6 – Conditional Statements

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Overview

- The “if” Statement
- The “if – else” Statement



The “ if ” Statement

- The ‘ if ’ statement is used to execute (or ignore) a set of statements after testing a condition.
- The ‘ if ’ statement evaluates a condition.
- If the given condition is true, the statement (or set of statements) following the ‘ if ’ is executed.
- If the given condition is false, the statement (or set of statements) following the ‘ if ’ is ignored and the control shifts to the next statement.

- **Syntax:** Syntax of ‘ if ’ statement is:

if (condition)

statement_1

statement_2

- **Condition:** Specifies a condition or relational expression. If true statement_1 will be executed and then statement_2. If false, statement_1 will be ignored and statement_2 will be executed.

The “ if ” Statement

- In the previous syntax, only statement_1 will be executed or ignored if the given condition is true or false respectively.
- To execute a set of statements following the ‘ if ’ statement, the set of statement will be enclosed in curly braces i.e. { }.
- The statements in { } are also known as compound statements.
- **Syntax:** The syntax of ‘ if ’ for executing a set of statements is:

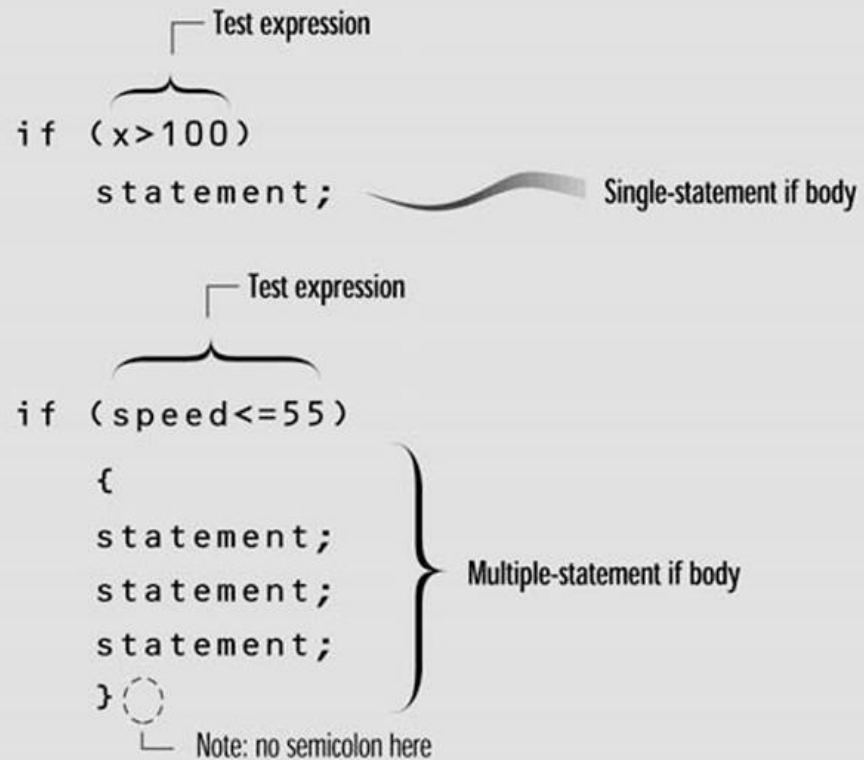
```
if (condition)
{
    statement_1
    statement_2
    statement_3
    statement_m
}
statement_n
```

If the condition given in the “ if ” statement is **true**, the compound statements given in the curly braces are **executed**.

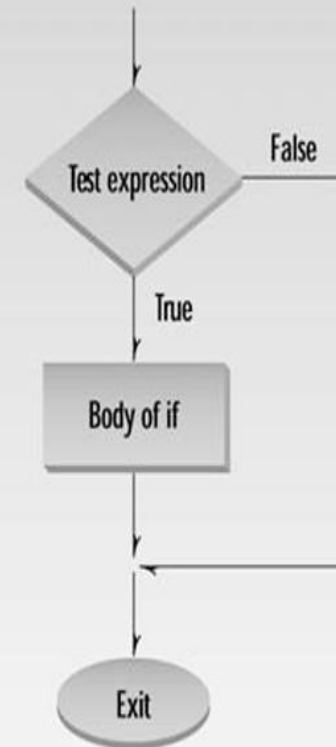
If the condition is **false**, the control shifts to the statement_n and the set of statements that follows the “if statements” is **ignored**.

The “if” Statement

- Flow Chart and Syntax



Syntax



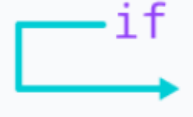
Flow Chart

The “if” Statement

- How it Works

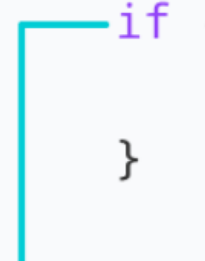
Condition is true

```
int number = 5;  
  
if (number > 0) {  
    // code  
}  
  
// code after if
```



Condition is false

```
int number = 5;  
  
if (number < 0) {  
    // code  
}  
  
// code after if
```



How if Statement Works

The “ if ” Statement

- Example Code

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

int main() {
    int x;

    cout<<“Enter a number: “;
    cin>>x;

    if( x > 100)
        cout << “That number is greater than 100\n”;

    return 0;
}
```



1_if_with_single_body_stat.cpp



2_if_with_multi_body_stats.cpp

The “ if – else ” Statement

- This is another form of “ if statement”.
- It is used for making **two-way** decisions.
- The “if statement” lets you do something if a condition is true. If it isn't true, nothing happens.
- But suppose we want to do one thing if a condition is true, and do something else if it's false. That's where the **if...else statement** comes in.
- It consists of an if statement, followed by a statement or block of statements, followed by the keyword else, followed by another statement or block of statements.

The diagram illustrates the syntax of the if-else statement in two examples. In the first example, the test expression is `(x > 100)`. The if body is a single statement `statement;`, and the else body is also a single statement `statement;`. In the second example, the test expression is `(zebra != 0)`. Both the if body and the else body consist of a block of multiple statements enclosed in curly braces `{ ... }`.

```
      Test expression
      └──┬──
if (x > 100)
    statement;
else
    statement;
```

Single-statement if body

Single-statement else body

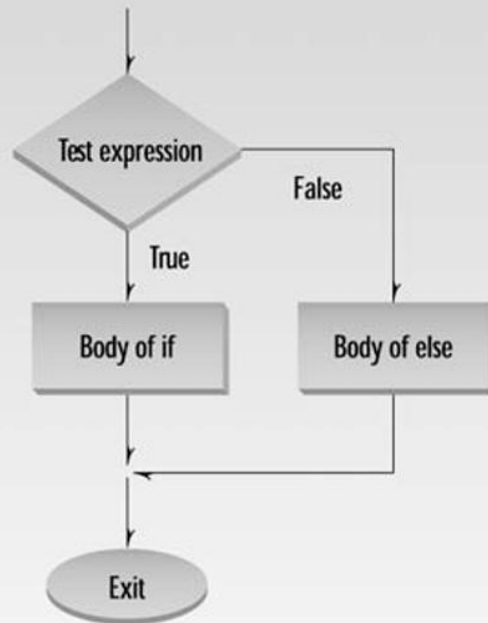

```
      Test expression
      └──┬──
if (zebra != 0)
{
    statement;
    statement;
}
else
{
    statement;
    statement;
}
```

Multiple-statement if body

Multiple-statement else body

The “ if – else ” Statement

Flow Chart



Condition is true

```
int number = 5;  
  
if (number > 0) {  
    // code  
}  
else {  
    // code  
}  
// code after if...else
```

Condition is false

```
int number = 5;  
  
if (number < 0) {  
    // code  
}  
else {  
    // code  
}  
// code after if...else
```

How if...else Statement Works

The “ if – else ” Statement

Code Example



3_if_else_with_single_body_stat.cpp



4_if_else_with_multi_body_stats.cpp

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

Int main() {
    int x;

    cout << "Enter a number: ";
    cin >> x;

    if ( x > 100)
        cout << "That number is greater than 100\n";
    else
        cout << "That number is not greater than 100\n";

    return 0;
}
```

Thank You