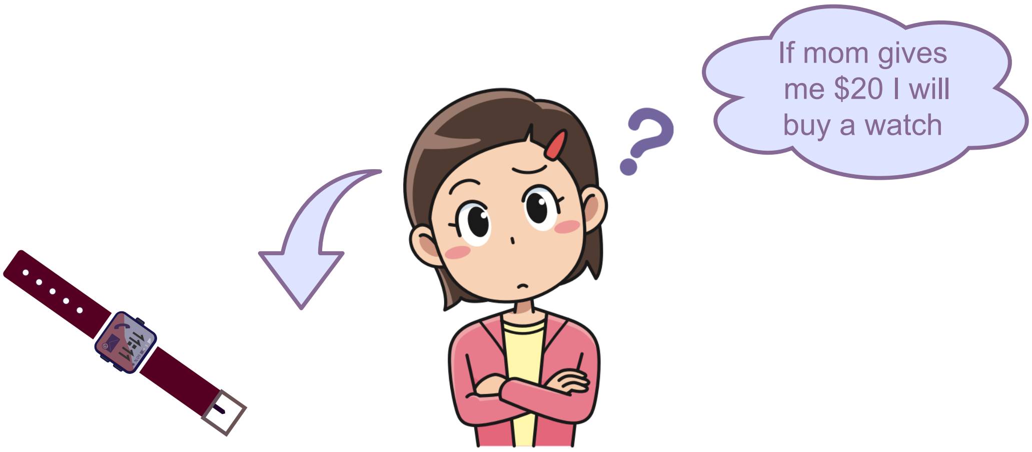
if Statement

In this lesson, you will be introduced to the if statement in C++.

Introduction

Suppose you can buy a watch if you get at least $20 in an allowance, otherwise not. In C++, how can we make a decision based on a condition?

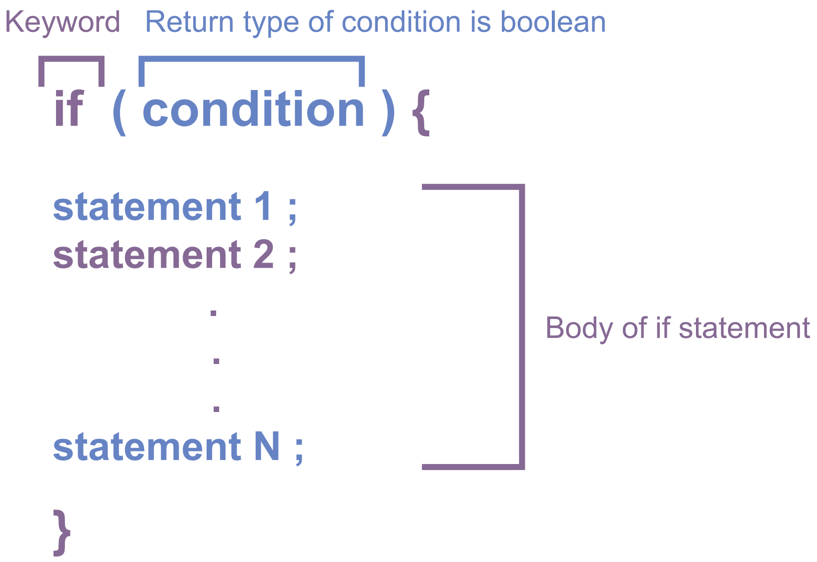


We can use an `if` statement to demonstrate this kind of behavior.

> *The **if statement** instructs a compiler to execute a particular block of code when the condition evaluates to true.*

Syntax

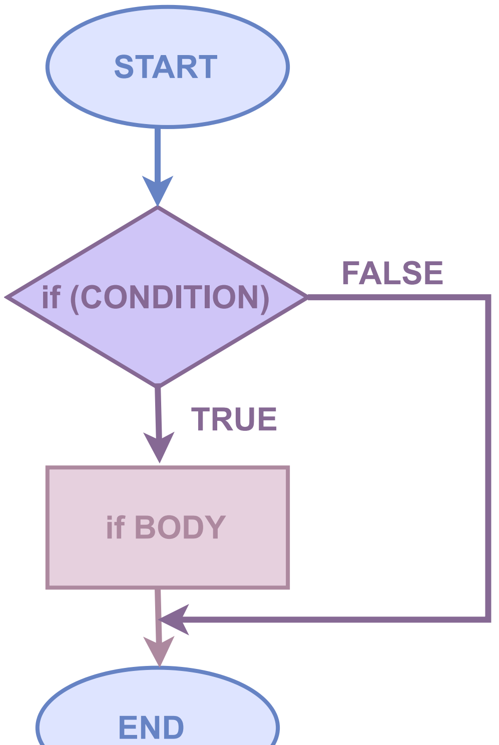
The general syntax of an `if` statement consists of the `if` keyword followed by the round brackets `( )`. These round brackets `( )` hold a condition specified by the programmer. Following the `if` condition is a block of code encapsulated in the curly brackets. This block of code is called the body of the `if` statement.



> 📝 In the condition inside the round brackets, we can use relational and logical operators for comparison.

Flowchart

The flow chart given below will explain the workings of the `if` statement:



In the above figure:

- The condition evaluates to `true` or `false`.
- If the condition is true, the compiler executes the statements inside the `if` body.
- Otherwise, the compiler exits the `if` block without running it.

> 📝 In C++, a zero or null value is considered false, and non-zero values are considered true.

Example program when the condition is `true`

Let’s convert the above example into a C++ program.

Run the code below and see how the “if statement” works!

```
#include <iostream>

using namespace std;

int main() {
  // Initialize money to 21
  int money = 21;
  // If condition
  if (money >= 20) {
    // If body
    cout << "You can buy a watch";
  }
  // Exit
  return 0;
}
```

Line No. 7: Sets the value of `money` to `21`

Line No. 9: Checks if the value of `money` is greater than or equal to `20`. If yes, then the condition returns `1`, and the code inside the curly brackets will be executed. The value of `money` is greater than `20`; therefore, the condition returns `1`.

Line No. 11: It prints `You can buy a watch` in output since the condition in **Line**

No. 9 is true.

> 📝 Writing the `if` keyword in the upper case will generate a syntax error.

Example program when the condition is `false`

Let’s see what happens if the condition evaluates to false.

Press the **RUN** button and see the output!

```
#include <iostream>

using namespace std;

int main() {
  // Initialize variable money
  int money = 9;
  // if condition
  if (money >= 20) {
    // if body
    cout << "You can buy a watch";
  }
  // exit
  return 0;
}
```

Line No. 7: Sets the value of `money` to `9`

Line No. 9: The value of `money` is less than `20`; therefore, the condition returns `0`.

Line No. 11: The condition in **Line No. 9** is `false`; therefore, the code inside the body of the `if` statement does not execute.

Quiz

Q

If `number = 85.3`, then what is the output of the following code?

```
float number;
if (number < 85.1) {
  cout << "Hey! I am less than 85.1" << endl;
}
```

```
cout << "number = " << number;
```

Retake Quiz

This sums up our discussion of the `if` statement. Let's dive right in and discuss the `if-else` statement in the upcoming lesson.