**Selection statements: if and else.**

The *if* keyword is used to execute a statement or block, if, and only if, a condition is fulfilled. Its syntax is:

*if (condition) statement*

Here, condition is the expression that is being evaluated. If this condition is true, statement is executed. If it is false, statement is not executed (it is simply ignored), and the program continues right after the entire selection statement.

For example, the following code fragment prints the message (x is 100), only if the value stored in the x variable is indeed 100:

|  |  |  |
| --- | --- | --- |
| 1 2 | if (x == 100)  cout << "x is 100"; |  |

If x is not exactly 100, this statement is ignored, and nothing is printed.

If you want to include more than a single statement to be executed when the condition is fulfilled, these statements shall be enclosed in braces ({}), forming a block:

|  |  |  |
| --- | --- | --- |
| 1 2 3 4 5 | if (x == 100)  {  cout << "x is ";  cout << x;  } |  |

As usual, indentation and line breaks in the code have no effect, so the above code is equivalent to:

|  |  |  |
| --- | --- | --- |
|  | if (x == 100) { cout << "x is "; cout << x; } |  |

Selection statements with *if* can also specify what happens when the condition is not fulfilled, by using the *else* keyword to introduce an alternative statement. Its syntax is:

*if (condition) statement1 else statement2*

where *statement1* is executed in case condition is true, and in case it is not, *statement2* is executed.

For example:

|  |  |  |
| --- | --- | --- |
| 1 2 3 4 | if (x == 100)  cout << "x is 100";  else  cout << "x is not 100"; |  |

This prints *x is 100*, if indeed x has a value of 100, but if it does not, and only if it does not, it prints *x is not 100* instead.

Several *if + else* structures can be concatenated with the intention of checking a range of values.

For example:

|  |  |  |
| --- | --- | --- |
| 1 2 3 4 5 6 | if (x > 0)  cout << "x is positive";  else if (x < 0)  cout << "x is negative";  else  cout << "x is 0"; |  |

This prints whether x is positive, negative, or zero by concatenating two if-else structures. Again, it would have also been possible to execute more than a single statement per case by grouping them into blocks enclosed in braces: {}.