

Selection in programming

When designing programs, there are often points where a decision must be made. This decision is known as selection, and is implemented in programming using IF statements.

Selection

An algorithm is a plan, a set of step-by-step instructions designed to solve a problem. When designing algorithms there are three basic building blocks (constructs) that can be used:

- sequencing
- selection
- iteration

Algorithms are used to help design programs that perform particular tasks.

What is selection?

An explanation of selection, as used in algorithms and programming

Selection is a decision or question.

At some point, a program may need to ask a question because it has reached a step where one or more options are available. Depending on the answer given, the program will follow a certain step and ignore the others.



Why is selection important?

Selection allows there to be more than one path through a program.

Many solutions feature several choices or decisions. These decisions lead to different paths through the program. These paths represent the result of making a choice. Without selection it would not be possible to include different paths in programs, and the solutions we create would not be realistic.

Selection in programming

Once an algorithm has been designed and perfected, it must be translated – or programmed – into code that a computer can read.

We create programs to implement algorithms. Algorithms consist of steps, where programs consist of statements.

Selection is implemented in programming using **IF** statements.

IF statements

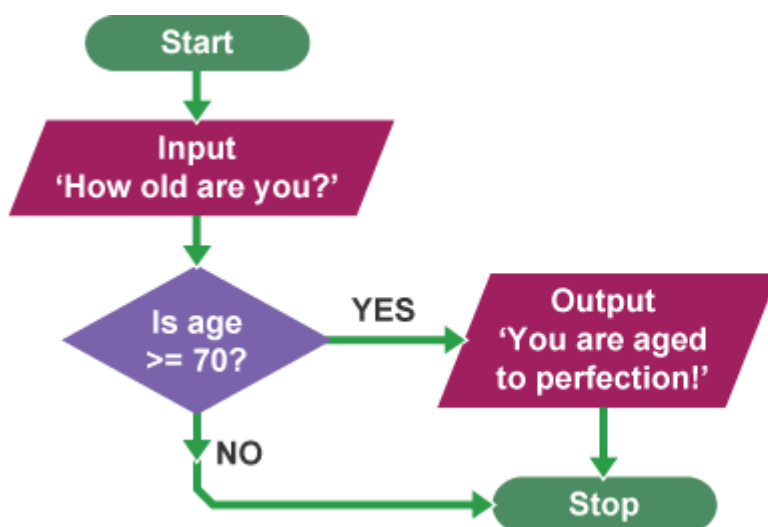
Programs consist of a set of instructions that are carried out one after another. Sometimes there may be more than one path (or set of steps) that can be followed. At this point, a decision needs to be made. This decision is known as selection.

For example, this simple algorithm prints out a message depending on how old you are:

1. Ask how old you are
2. **IF** you are 70 or older, say “You are aged to perfection!”

The selection comes in step 2. If you are aged 70 or over, one message is displayed.

As a flowchart, the algorithm would look like this:



In programming, selection is implemented using an IF statement

IF...ELSE

In programming, selection is usually represented by the statements **IF** and **ELSE**:

- **IF** represents the question
- **ELSE** points to what to do if the answer to the question is **false**

For example, this simple algorithm prints out a different message depending on how old you are. Using IF and ELSE, the steps are:

- Ask how old you are
- **IF** you are 70 or older, say "You are aged to perfection!"
- **ELSE** say "You are a spring chicken!"

If this algorithm is tried using 75 as our age, the answer to the question at step 2 is true, so the algorithm tells us to say "You are aged to perfection!"

If the algorithm is tried using 15 as our age, the answer to the question at step 2 is false, so the algorithm tells us to say "You are a spring chicken!"

Two different paths are followed according to the answer given to a particular question. The flowchart to illustrate this algorithm is:

