## Differences between the for loop, while loop and do…while loop

The for loop is used to execute a block of code for a known number of iterations, for instance, when counting from 0 to 9. The while loop is used when a block of code must be executed for an unknown number of iterations until a condition returns the logic value of false. For example, the user is prompted to enter a number between 5 and 10 and is repeatedly asked to do so until this condition is met. The do…while loop executes of a block of code at least once. Each subsequent iteration is undertaken provided a condition returns true. While the do…while loop can end only after at least one iteration, the while loop can end having executed no code at all.

## Pros and Cons of the for loop

|  |  |
| --- | --- |
| Pros | Cons |
| The start and end points and increment/decrement are all decided by the developer (provides flexibility) | Mistakes can easily be made as there are many variables to be aware of |
| Readable, simple to understand | The loop will execute should an initial condition be met, if the initial value is altered elsewhere, the code in the loop may never be executed |
| Difficult to become an infinite loop unless the stop condition has a bug |  |

## Pros and Cons of the while loop

|  |  |
| --- | --- |
| Pros | Cons |
| The loop will not stop executing until the goal is reached and can be modified which makes it a flexible tool for a variety of applications | If there is a bug in the stop condition, the loop could be infinite or lead to unexpected results |
| The number of iterations for the loop to run does not need to be specified | If the initial condition is incorrect, the loop may end prematurely or not execute at all |
| It’s efficient as repetitive tasks can be automated, particularly for big data sets and sophisticated algorithms, without needing to write the same code again and again |  |

## Pros and Cons of the do…while loop

|  |  |
| --- | --- |
| Pros | Cons |
| Unlike other loops, the loop will certainly execute at least once regardless of the stop condition | If the stop condition is incorrect or missing, the loop can become infinite or lead to unexpected results |
| Repetitive tasks can be automated in the same manner as the while loop |  |