What is a Loop?

- Loop is a statement in C++, which allows us to execute a block of code for n number of times
- We need loops to avoid writing repetitive code manually

Loops

- Each loop has a loop body
- The Loop body is the block of code statements written inside the loop

Example Problem to show the need of Loops

- print “Hello World” 10 times

Manual Method


```cpp
// C++ program to Demonstrate the need of loops
#include <iostream>
using namespace std;

int main()
{
    cout << "Hello World\n";
    cout << "Hello World\n";
    cout << "Hello World\n";
    cout << "Hello World\n";
    cout << "Hello World\n";
    return 0;
}
```

Using Loops

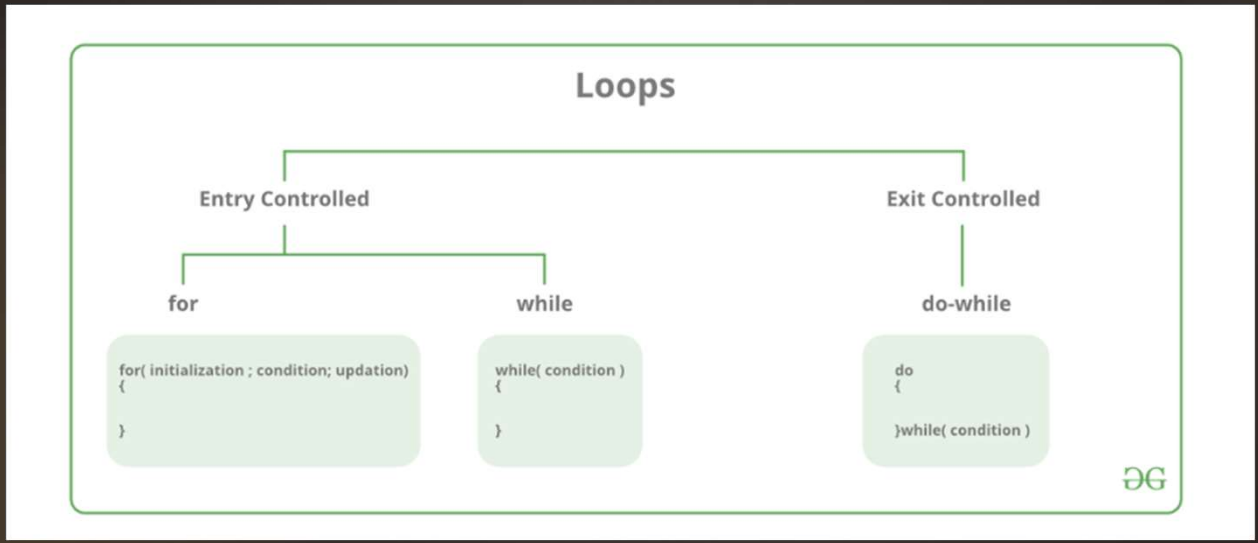

```
//Loop: Repeats a block of code/number of statements


for(int i=0; i<=5; i++){
    cout<<"Hello";
}
```

Types of Loops

- Mainly two types of the loops:
  - Entry Controlled:
    - Test condition is tested before entering the body of loop
    - For loop and while loop are examples of entry controlled loops
  - Exit Controlled :
    - Test condition is tested after the body of loop, body comes before the test condition
    - Loop body executes at least once, no matter the condition becomes true/false
    - Do-While is an example of exit controlled loop

Types of Loops



For-Loop

- **Loop Structure:**
  - Allows us to write a loop, which executes for a specific number of times
  - Useful when you know the number of repetitions in advance

Syntax:

```
for (initialization expr; test expr; update expr)
{
      // body of the loop
      // statements we want to execute
}
```

Initialization statement

Executes for once only

Can contain declaration of multiple local variables, limited to the scope of loop

Variables inside main function with same name as the loop variables are hidden during loop execution

Condition

- This statement gets evaluated ahead of each execution of the loop body.
- Abort the execution if the given condition get false.

Update expr

THE VALUES OF VARIABLES GET INCREMENTED/DECREMENTED