

Why Loop?

The loop is used to do a repeated task

For Loop:

In C++, for loop is an entry-controlled loop that is used to execute a block of code repeatedly for the specified range of values. Basically, for loop allows you to repeat a set of instructions for a specific number of iterations.

for loop is generally preferred over while and do-while loops in case the number of iterations is known beforehand.

Syntax of for Loop

The syntax of for loop in C++ is shown below:

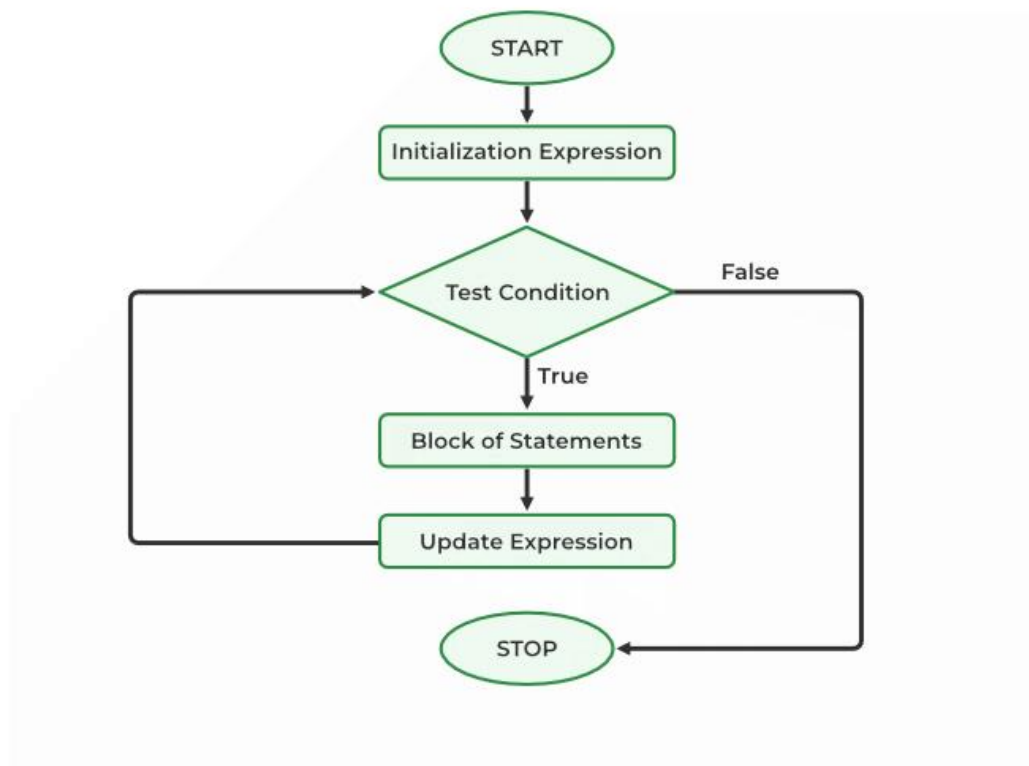
for (initialization; condition; updation)

{

 // body of for loop

}

Flowchart of for Loop in C++ :



Program :

```
#include<iostream>
using namespace std;

int main(){
    //To print first 5 numbers
    for(int i=1;i<=5;i=i+1){
        cout<<i<<endl;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

1
2
3
4
5

Break Keyword in Loop :

The break in C++ is a loop control statement that is used to terminate the loop. As soon as the break statement is encountered from within a loop, the loop iterations stop there and control returns from the loop immediately to the first statement after the loop.

Program :

```
#include<iostream>
using namespace std;

int main(){
    //To print first 5 numbers
    for(int i=1;i<=10;i=i+1){
        if(i==5){
            break;
        }
        cout<<i<<endl;
    }
}
```

Output :

```
PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp
```

```
PS E:\C++ PROGRAMMES> ./a.exe
```

```
1
2
3
4
```

The break statement is executed when $i=5$, so the loop is encountered and the iterations from 5 is not executed.

Continue keyword in loop :

C++ continue statement is a loop control statement that forces the program control to execute the next iteration of the loop. As a result, the code inside the loop following the continue statement will be skipped and the next iteration of the loop will begin.

Program:

```
#include<iostream>
using namespace std;

int main(){
    //To print first 5 numbers
    for(int i=1;i<=10;i=i+1){
        if(i==5){
            continue;
        }
        cout<<i<<endl;
    }
}
```

Output :

```
PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp
```

```
PS E:\C++ PROGRAMMES> ./a.exe
```

```
1
2
3
4
6
```

7
8
9
10

The value 5 is not printed

For More Reference : <https://www.geeksforgeeks.org/cpp-for-loop/>

<https://www.geeksforgeeks.org/cpp-break-statement/>

<https://www.geeksforgeeks.org/continue-statement-cpp/>

While Loop :

While Loop in C++ is used in situations where we do not know the exact number of iterations of the loop beforehand. The loop execution is terminated on the basis of the test condition. Loops in C++ come into use when we need to repeatedly execute a block of statements. During the study of the 'for' loop in C++, we have seen that the number of iterations is known beforehand, i.e. the number of times the loop body is needed to be executed is known to us.

Syntax:

```
while (test_expression)
{
    // statements

    update_expression;
}
```

Program :

```
#include<iostream>
using namespace std;

int main(){
    int i=1;
    while(i<=5){
        cout<<i<<endl;
        i=i+1;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

1
2
3
4
5

For More Reference : <https://www.geeksforgeeks.org/cpp-while-loop/>

Home Work Questions :

1.print from 1 to 100

Using For Loop

```
#include<iostream>
using namespace std;

int main(){
    for(int i=1;i<=100;i++){
        cout<<i<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    int i=1;
    while(i<=100){
        cout<<i<<" ";
        i++;
    }
    cout<<endl;
}
```

Ouput :

PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

```
1  2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73
74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96
97 98 99 100
```

2. Print 100 to 1 :

Using For Loop

```
#include<iostream>
using namespace std;

int main(){

    for(int i=100;i>=1;i--){
        cout<<i<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    int i=100;
    while(i>=1){
        cout<<i<<" ";
        i--;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76
75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

3. Print your name 50 times

Using For Loop

```
#include<iostream>
using namespace std;

int main(){
    for(int i=0;i<50;i++){
        cout<<"Rohini"<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    int i=0;
    while(i<50){
        cout<<"Rohini ";
        i=i+1;
    }
    Cout<<endl;
}
```

Output :

```
PS E:\C++ PROGRAMMES> g++ .\forandwhileloop.cpp
```

```
PS E:\C++ PROGRAMMES> ./a.exe
```

```
Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini
Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini
Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini
Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini
Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini Rohini
```

4. Print 0 to -10

Using For Loop

```
#include<iostream>
using namespace std;

int main(){
    for(int i=0;i>= -10;i--){
        cout<<i<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    int i=0;
    while(i>=-10){
        cout<<i<<" ";
        i--;
    }
    cout<<endl;

    return 0;
}
```

Output :

```
PS E:\C++ PROGRAMMES> g++ forandwhileloop.cpp
```

```
PS E:\C++ PROGRAMMES> ./a.exe
```

```
0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10
```


5.Print 7th table

Using For Loop

```
#include<iostream>
using namespace std;

int main(){
    int y;
    cout<<"Enter the number to print the Multiplication table : ";
    cin>>y;
    for(int i=1;i<=10;i++){
        cout<<y<<" X " <<i<<" = "<<y*i<<endl;
    }
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    int y,i=1;
    cout<<"Enter the number to print the Multiplication table : ";
    cin>>y;

    while(i<=10){
        cout<<y<<" X " <<i<<" = "<<y*i<<endl;
        i++;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

Enter the number to print the Multiplication table : 7

7 X 1 = 7

7 X 2 = 14

7 X 3 = 21

7 X 4 = 28

7 X 5 = 35

7 X 6 = 42

7 X 7 = 49

7 X 8 = 56

7 X 9 = 63

7 X 10 = 70

6. print A-Z alphabets

Using For Loop

```
#include<iostream>
using namespace std;

int main(){
    for(char ch = 'A'; ch<='Z'; ch=ch+1){
        cout<<ch<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    char ch='A';
    while(ch<='Z'){
        cout<<ch<<" ";
        ch=ch+1;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

7. print a-z alphabets

Using For Loop

```
#include<iostream>
using namespace std;

int main(){

    for(char ch = 'a'; ch<='z'; ch=ch+1){
        cout<<ch<<" ";
    }
    cout<<endl;
}
```

Using While Loop

```
#include<iostream>
using namespace std;

int main(){
    char ch='a';
    while(ch<='z'){
        cout<<ch<<" ";
        ch=ch+1;
    }
}
```

Output :

PS E:\C++ PROGRAMMES> g++ forandwhileloop.cpp

PS E:\C++ PROGRAMMES> ./a.exe

a b c d e f g h i j k l m n o p q r s t u v w x y z