4

C++ for Loop   (Saathi)

In a Computer programming, loops are used to repeat a block of Code.

for example, lets say we want to show a message 100 times. Then insted of writing the print statement 100 times. We can use a loops.

There are three types of loops in C++

1] for loop.
2] While loop.
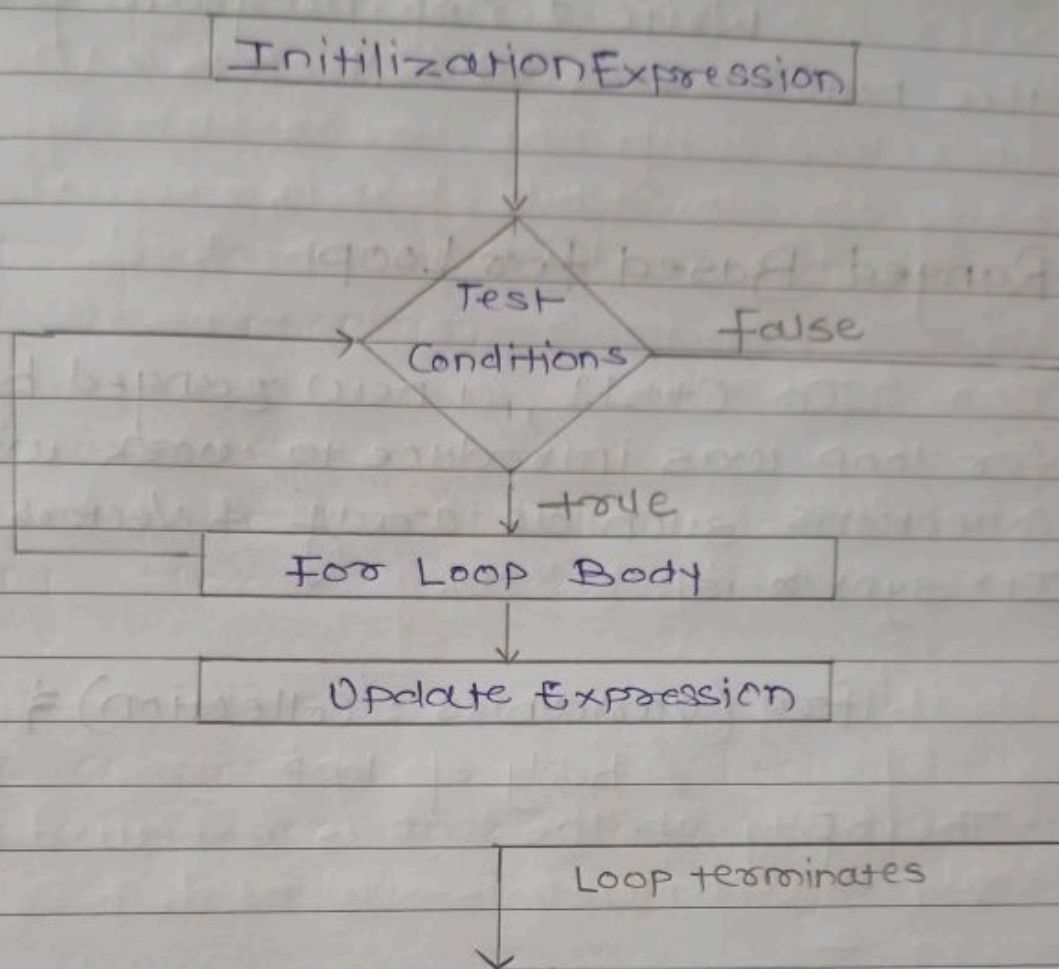3] do...While loop.

C++ for Loop

The syntex of for... Loop is

• Initilization - Variables & is execute only once.
• Condition - If true, the body of for loop is executed if pause, The loop is terminated.
• Update - Update the value of initilize variables & agin check the condition.

Flowchart of for Loop in c++

```
        ┌─────────────────────────┐
        │ Initilization Expression│
        └─────────────────────────┘
                    │
                    ▼
              ╱──────────╲
             ╱    Test    ╲  ──── False ────┐
    ┌───────▶╲ Conditions ╱                 │
    │         ╲──────────╱                  │
    │              │ true                   │
    │              ▼                        │
    │    ┌──────────────────┐               │
    │    │  For Loop Body   │               │
    │    └──────────────────┘               │
    │              │                        │
    │    ┌──────────────────┐               │
    └────│ Update Expression│               │
         └──────────────────┘               │
                                            │
                    ┌──── Loop terminates ──┘
                    ▼
```

Display a text 5 times

```cpp
#include<iostream>
using namespace std;
int main(){
    int main for(int i=0; i<=5; i++){
        cout<<"Hello Tejas"<<endl}
    {
        return 0;
    {
```

Write a cpp program for printing the numbers 1 to 5.

Ranged Based for Loop

In C++11, a new ranged based for loop was introduce to work with collections such as array & vectors. Its syntax is:

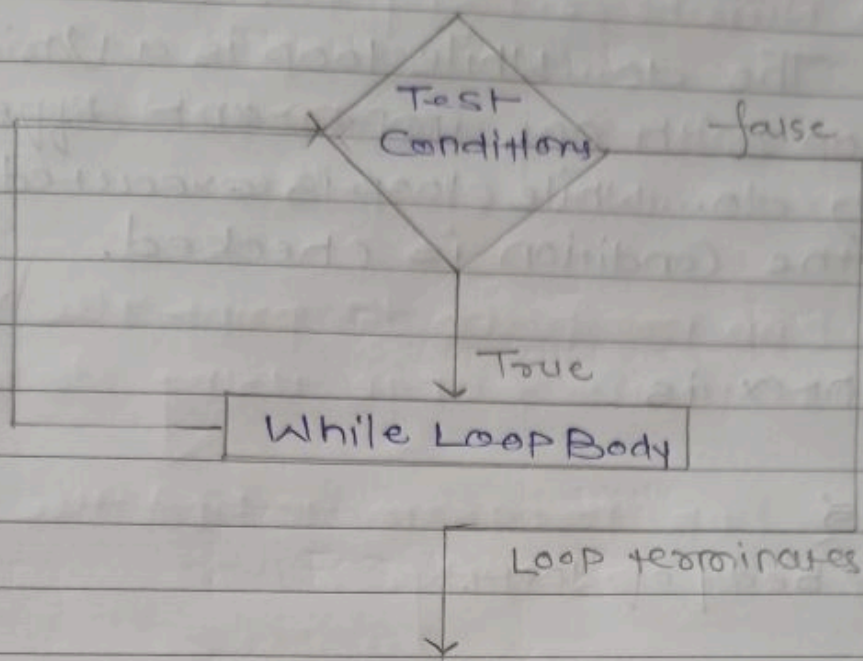|	

for (variables : Collection) {
 // body of loop
 }	

C++ While loop

The syntax of while loop is

While (condition) {
 // body of the loop
 }

- A while loop evaluates the condition true, the code inside the loop is executed.

- When the code evaluate false, the loop halt / terminated.

Flowchart of While loop

Example:
Display the number 1 to 5

```cpp
#include<iostream>
using namespace std;
int main(){
    int i = 1;
    while (i<=5){
        cout<<" i <<" ";
        ++i;
    }
    return 0;
}
```

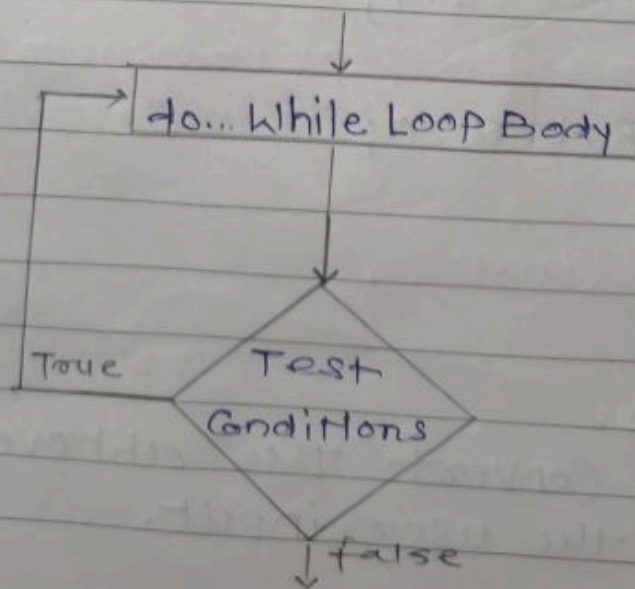Quick Quiz:
Convert the above program into the user input.

C++ do...While Loop

The do...While loop is a varient of the while loop with one important difference: the body of do...while loop is executed once before the condition is checked.

Its syntax is

```
do{
    body of loop.
}
While (condition);
```

- The body of the loop is executed at first. Then the condition is evaluated.

- If the condition evaluated to true, the body inside the do statement is executed again.

- The process continue untail the condition evaluate to feuse. Then the loop stop.

```
          ┌──────────────► do...While Loop Body
          │                         │
          │                         ▼
      True │                    ╱ Test ╲
          └──────────────────  ╲ Conditions ╱
                                    │ false
                                    ▼
```

Example : Display Number from 1 to 5.

```cpp
#include <iostream>
using namespace std;
int main() {
    int i = 1;
    do {
        cout << " " i << " ";
        ++i;
    }
    While (i <= 5);
    return 0;
}
```

Expected output :
1, 2, 3, 4, 5

4.

Practice Set   (Saathi)

1. Write a Cpp program to Calculate sum of Natural Numbers. Using for Loop.

2. Write a Cpp program to find the program Leap year or not. If-else

3. Write a Cpp program to print The multiplication table with input range using do while loop.

4. Write a Cpp program to find the sum of positive Numbers only.

5. Write a Cpp program to print the fibonacci series up to n numbers of terms.

6. Write a Cpp program to print half pyramid using *

```
*
* *
* * *
* * * *
* * * * *
```