

Conditional Statements and Loops in C

For Loop in C

The looping can be defined as repeating the same process multiple times until a specific condition satisfies. It is known as iteration also. There are three types of loops used in the C language.

In programming, a loop is used to repeat a block of code until the specified condition is met.

C programming has three types of loops:

- for loop
- while loop
- do...while loop

Syntax of `for` Loop

```
c Copy code  
  
for (initialization; condition; increment/decrement) {  
    // Code to be executed repeatedly  
}
```

Explanation:

1. **Initialization:** It is executed once when the loop starts. Typically, it sets a loop counter to an initial value.
2. **Condition:** This expression is evaluated before each iteration of the loop. If the condition is true, the loop continues; if false, the loop ends.
3. **Increment/Decrement:** This expression is executed at the end of each iteration. It usually updates the loop counter.

Solved Example and Working

Ques: Write a Program in C Lang to print 5 Numbers i.e. 1,2,3,4,5, using For Loop.

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Introduction to 'C' Language - Module 3

```
c Copy code
#include <stdio.h>

int main() {
    // This loop will print numbers from 1 to 5
    for (int i = 1; i <= 5; i++) {
        printf("Number: %d\n", i);
    }
    return 0;
}
```

OUTPUT:

```
The output of the program will be:

javascript Copy code
Number: 1
Number: 2
Number: 3
Number: 4
Number: 5
```

Explanation of Each Part of the for Loop:

- **Initialization** (int i = 1;): This sets the starting value of the loop counter i to 1.
- **Condition** (i <= 5;): This checks if the loop counter i is less than or equal to 5. If true, the loop body executes; if false, the loop ends.
- **Increment** (i++): This increases the value of i by 1 after each iteration.

Assignment

1. Write a C-program to print 10 natural numbers.
2. Write a Program to print table for the given number using while loop in C
3. Write a Program to print natural numbers 1to15
4. Write a Program for loop to print numbers from 1 to 10 in reverse order:

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- 5. Write a for loop that calculates and prints the sum of integers from 1 to 100.
- 6. Write a for loop to print the factorial of the number 5.
- 7. Write a for loop that prints all the prime numbers between 1 and 50.
- 8. Write a for loop to print the sum of all odd numbers between 1 and 50.
- 9. Write a for loop that prints a pattern of asterisks in a right-angled triangle shape of 5 rows, like this:

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

- 10. Create a for loop to print a number pyramid where each row contains a number of digits equal to the row number. For example, for 4 rows:

```
1  
22  
333  
4444
```

- 11. Write a for loop that calculates and prints the product of all even numbers between 1 and 20.

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