

Conditional Statements and Loops in C

Do While 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

do-while Loop in C Language

The do-while loop in C is a variation of the while loop. The key difference is that a do-while loop guarantees that the loop body will execute at least once, even if the condition is false from the beginning. This is because the condition is evaluated **after** the loop body executes, rather than before.

How It Works

1. The statements inside the do block are executed first.
2. After executing the block, the condition is checked.
3. If the condition is true, the loop repeats; if false, the loop ends.



CBSE



ICSE



NTSE



Banking &  
Insurance



Central Govt.  
Service



State Govt.  
Services



LAW  
Entrance



MBA  
Entrance



Railways & Metro  
Services

...many more

abhyasonline.in

Course  
&  
Test Series

## Introduction to 'C' Language - Module 5

### Solved Example with Explanation

#### Example

```
c Copy code  
  
#include <stdio.h>  
  
int main() {  
    int number = 1;  
  
    do {  
        printf("Number: %d\n", number);  
        number++;  
    } while (number <= 5);  
  
    return 0;  
}
```

#### Explanation

- In this example, the `do-while` loop will print numbers from 1 to 5.
- The variable `number` starts at 1. The `do` block runs, printing `1`, and then increments `number`.
- The condition `number <= 5` is checked after the loop executes.
- This process repeats until `number` becomes 6, at which point the loop stops.

#### Key Points

- **At Least One Execution:** The loop body is always executed at least once, even if the condition is initially false.
- **Post-Condition Check:** The condition is checked after executing the loop body, unlike while and for loops, where the condition is checked before the loop body.
- **Use Cases:** do-while loops are useful when you want to ensure that the loop body executes at least once, such as when prompting a user for input at least once before validation.

 Banking & Insurance

 Central Govt. Service

 State Govt. Services

 LAW Entrance

 MBA Entrance

 Railways & Metro Services

...many more

abhyasonline.in

**Introduction to 'C' Language - Module 5**

**Course & Test Series**

---

 **CBSE**

---

 **ICSE**

---

 **NTSE**

---

 **Banking & Insurance**

---

 **Central Govt. Service**

---

 **State Govt. Services**

---

 **LAW Entrance**

---

 **MBA Entrance**

---

 **Railways & Metro Services**

---

**...many more**

**abhyasonline.in**

```
#include <stdio.h>
int main()
{
    int i=0;
    do
    {
        printf("while vs do-while\n");
    }while(i==1);
    printf("Out of loop");
}
```

**Example of Do while Loop with Explanation**

**Output:**

```
while vs do-while
Out of loop
```

**Explanation:** As I mentioned in the beginning of this guide that do-while runs at least once even if the condition is false because the condition is evaluated, after the execution of the body of loop.

**Comparison of For, While, and do-While loops in C:**

Feature	'for' Loop	'while' Loop	'do-while' Loop
Initialization	Yes, can initialize control variables	No, initialization outside the loop	No, initialization outside the loop
Condition Check	Before each iteration	Before each iteration	After each iteration
Loop Execution	Executes zero or more times	Executes zero or more times	Executes at least once, even if the condition is false
Increment/Decrement	Usually handled within the loop header	Must be explicitly written inside the loop	Must be explicitly written inside the loop
Syntax	<code>for (init; condition; increment) { ... }</code>	<code>while (condition) { ... }</code>	<code>do { ... } while (condition);</code>
Use Case	Ideal when the number of iterations is known	Ideal when the loop needs to run based on a condition	Ideal when the loop must execute at least once
Readability	More concise for definite iterations	More flexible for indefinite loops	Ensures the loop body runs at least once

Course  
&  
Test Series

Introduction to 'C' Language - Module 5

Conclusion

- Use **for loop** when you know the number of iterations.
- Use **while loop** when the loop depends on a condition being true.
- Use **do-while loop** when you need to execute the loop body at least once, regardless of the condition.

Assignment

Ques 1: Write a C program to print numbers from 1 to 10 and 10 to 1 using a do-while loop.

Ques 2: Write a C program that prompts the user to input a series of integers until the user stops by entering 0 using a do-while loop. Calculate and print the sum of all positive integers entered.

**Ques 3: Sum of First n Natural Numbers**

- **Problem:** Write a C program using a do-while loop to calculate the sum of the first n natural numbers (where n is provided by the user).
- **Example Input:** n = 5
- **Expected Output:** Sum = 15

**Ques 4: Factorial of a Number**

- **Problem:** Write a C program using a do-while loop to calculate the factorial of a given number n.
- **Example Input:** n = 4
- **Expected Output:** Factorial = 24

**Ques 5: Reverse a Number**

- **Problem:** Write a C program using a do-while loop to reverse a given number.
- **Example Input:** n = 1234
- **Expected Output:** Reversed Number = 4321

**Ques 6: Sum of Digits of a Number**

- **Problem:** Write a C program using a do-while loop to calculate the sum of the digits of a given number.
- **Example Input:** n = 4321
- **Expected Output:** Sum of digits = 10

 <b>CBSE</b>
 <b>ICSE</b>
 <b>NTSE</b>
 <b>Banking &amp; Insurance</b>
 <b>Central Govt. Service</b>
 <b>State Govt. Services</b>
 <b>LAW Entrance</b>
 <b>MBA Entrance</b>
 <b>Railways &amp; Metro Services</b>
<b>...many more</b>

abhyasonline.in



Course  
&  
Test Series

Introduction to 'C' Language - Module 5



CBSE

Ques 7: Count the Number of Digits

- **Problem:** Write a C program using a do-while loop to count the number of digits in a given number.
- **Example Input:** n = 54321
- **Expected Output:** Number of digits = 5



ICSE

Ques 8: Print Multiplication Table

- **Problem:** Write a C program using a do-while loop to print the multiplication table of a given number n.
- **Example Input:** n = 7
- **Expected Output:**

7 \* 1 = 7  
7 \* 2 = 14  
...  
7 \* 10 = 70



NTSE

Ques 9: Check Palindrome Number

- **Problem:** Write a C program using a do-while loop to check if a given number is a palindrome (a number that reads the same backward as forward).
- **Example Input:** n = 121
- **Expected Output:** 121 is a palindrome



Banking &  
Insurance



Central Govt.  
Service



State Govt.  
Services



LAW  
Entrance



MBA  
Entrance



Railways & Metro  
Services

...many more

abhyasonline.in

