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While Loop

do..while Loop

What is a **do-while** loop?

A **do-while** loop **executes the code at least once**, then checks the condition.

Syntax

```
do {  
    // code to execute  
} while (condition);
```

🔑 **Key point:** The condition is checked **after** the loop body.

Example 1: Print Numbers from 1 to 5

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

Output

```
1 2 3 4 5
```

Explanation:

- **i** starts at 1
- The loop prints the number
- **i** increases by 1
- The loop runs until **i** becomes greater than 5

Example 2: Print "Hello" 3 Times

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

int main() {
    int count = 1;

    do {
        cout << "Hello\n";
        count++;
    } while (count <= 3);

    return 0;
}
```

Explanation:

- The loop runs exactly 3 times
- Useful when you know how many times to repeat something

Example 3: Sum of First 5 Natural Numbers

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

int main() {
    int i = 1, sum = 0;

    do {
        sum += i;
        i++;
    } while (i <= 5);

    cout << "Sum = " << sum;
    return 0;
}
```

Output

```
Sum = 15
```

Example 4: Menu-Driven Program (Real-Life Use)

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

int main() {
    int choice;

    do {
        cout << "\n1. Say Hello";
        cout << "\n2. Say Bye";
        cout << "\n3. Exit";
        cout << "\nEnter your choice: ";
        cin >> choice;

        if (choice == 1)
            cout << "Hello!\n";
        else if (choice == 2)
            cout << "Bye!\n";

    } while (choice != 3);

    return 0;
}
```

Why do-while here?

- The menu **must appear at least once**
- Perfect for menus and user input programs

Example 5: Loop Runs At Least Once (Important Concept)

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

int main() {
    int i = 10;

    do {
        cout << "This will print once\n";
    } while (i < 5);

    return 0;
}
```

Explanation:

- Condition is **false**
- Still, the message prints **once**
- This is the main difference from **while** loop

Comparison: **while** vs **do-while**

Feature	while	do-while
Condition checked	Before loop	After loop
Runs at least once	✗ No	<input checked="" type="checkbox"/> Yes
Best for	Unknown executions	Menus / user input

When to Use **do-while**

☒ When the loop **must execute at least once** ☒ For **menus, password checks, user input**
