

# Loops in C - Explanation and Differences

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## 1. for loop Example:

```
for (int i = 0; i < 5; i++) {  
    printf("%d\n", i);  
}
```

Description: Repeats a block of code for a known number of iterations.

Usage: When the number of iterations is known in advance.

## 2. while loop Example:

```
int i = 0;  
while (i < 5) {  
    printf("%d\n", i);  
    i++;  
}
```

Description: Repeats a block of code as long as a condition remains true. Condition is checked before the loop body.

Usage: When the number of iterations is not known and the condition must be checked first.

## 3. do-while loop Example:

```
int i = 0;  
do {  
    printf("%d\n", i);  
    i++;  
} while (i < 5);
```

Description: Similar to while, but the loop body is executed at least once, condition is checked after the loop body.

Usage: When the loop body must execute at least one time regardless of the condition.

## Differences between loops:

Loop Type	Condition Check	Guaranteed Execution	Use Case
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for	Before loop body	No	When loop runs a known number of times
while	Before loop body	No	When loop runs an unknown number of times
do-while	After loop body	Yes (at least once)	When loop must run at least once