

Introduction to programming with C

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Outline

- The if statement
- The for statement
- The while and do while loops

The if statement

- The if statement in C is used to make decisions in your code.
- It allows you to execute a block of code only if a specified condition evaluates to true (non-zero value).

```
if (condition) {  
    // Code to execute if condition is true  
} else {  
    // Code to execute if condition is false (optional)  
}
```

The if statement

```

1  #include <stdio.h>
2
3  int main() {
4      int number;
5
6      // Ask the user for input
7      printf("Enter an integer: ");
8      scanf("%d", &number);
9
10     // Check if the number is positive, negative, or zero
11     if (number > 0) {
12         printf("The number is positive.\n");
13     } else if (number < 0) {
14         printf("The number is negative.\n");
15     } else {
16         printf("The number is zero.\n");
17     }
18
19     return 0;
20 }
```

The for statement

- The for statement in C is a control flow statement that allows code to be executed repeatedly based on a given condition.
- It is typically used for looping a specific number of times.

```
for (initialization; condition; increment/decrement) {  
    // Code to be executed in each iteration  
}
```

Initialization: This step is executed first, used to declare and initialize loop control variables.

Condition: This expression is evaluated before each iteration of the loop.

Increment/Decrement: This step is executed at the end of each loop iteration, usually to update the loop control variable.

The for statement

```
1  #include <stdio.h>
2
3  int main() {
4      // Using a for loop to iterate from 1 to 10
5      for (int i = 1; i < 10; i++) {
6          printf("%d", i);
7          printf("\n");
8      }
9
10     return 0;
11 }
12
```

The while loop

- A while loop is used to repeatedly execute a block of code as long as a specified condition evaluates to true.

```
while (condition) {  
    // Code to be executed repeatedly  
}
```

The while loop

```
1  #include <stdio.h>
2
3  int main() {
4      int count = 1; // Initialize a counter variable
5
6      while (count <= 10){ // Condition to check
7          printf("%d", count); // Print the current count
8          count++; // Increment the counter
9          printf("\n");
10     }
11
12     return 0; // Exit the program
13 }
14
```


The do while loop

- A do while loop executes a block of code at least once and then repeatedly executes the block as long as a specified condition evaluates to true.

```
do {  
    // Code to be executed  
} while (condition);
```

The do while loop

```
1 #include <stdio.h>
2
3 int main() {
4     int number;
5
6     do {
7         printf("Please enter a positive number: ");
8         scanf("%d", &number);
9     } while (number >= 0); // Condition to check if the number is positive
10
11     printf("You entered: %d", number);
12     return 0;
13 }
14
```