- The do-while loop is a type of loop where the code block is executed at least once, and then the condition is checked.
- If the condition is true, the loop will continue to execute the code block.
- If the condition is false, the loop will terminate and the program will proceed to the next statement after the loop.

## Syntax of a do-while loop in C:

C

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

## Example:

C

```c
#include <stdio.h>

int main() {
    int count = 0;

    do {
        printf("Count: %d\n", count);
        count++;
    } while (count < 5);

    return 0;
}
```

## Explanation:

- In this example, the variable count is initially set to 0.
- The code block inside the do-while loop is executed first, which prints the current value of count.
- Then, the count variable is incremented by 1.
- The condition count < 5 is checked, and since it is true, the loop continues to execute.
- This process repeats until count becomes 5, at which point the condition becomes false, and the loop terminates.

## Output:

Output

```
Count: 0
Count: 1
Count: 2
Count: 3
Count: 4
```

---

# Practice Problems On Do While Loop In C:

## Problem 1: Sum of Digits

Write a program that calculates the sum of the digits of a given positive integer.

C

```c
#include <stdio.h>

int main() {
    int num, digit, sum = 0;

    printf("Enter a positive integer: ");
    scanf("%d", &num);

    do {
        digit = num % 10;
        sum += digit;
        num /= 10;
    } while (num > 0);

    printf("Sum of digits: %d\n", sum);

    return 0;
}
```

## Explanation:

- The program takes input from the user for a positive integer num.
- It initializes variables digit and sum to 0. The do-while loop executes the code block at least once.
- In each iteration, the last digit of num is obtained using the modulo operator (%) and stored in digit.
- The digit is added to the sum.
- The last digit of num is removed by dividing it by 10.
- The loop continues until num becomes 0.

- Finally, the sum of the digits is printed.

## Output:

Output

```
Enter a positive integer: 25
Sum of digits: 7
```

---

## Problem 2: Guessing Game

Write a program that generates a random number between 1 and 100. The user needs to guess the number, and the program provides feedback on whether the guess is too high or too low until the correct number is guessed.

C

```c
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

int main() {
    int number, guess, attempts = 0;

    srand(time(0));
    number = rand() % 100 + 1;

    do {
```

```
        printf("Guess the number (1-100): ");
        scanf("%d", &guess);

        attempts++;

        if (guess > number) {
            printf("Too high\n");
        } else if (guess < number) {
            printf("Too low\n");
        } else {
            printf("Congratulations! You guessed it right in %d
attempts.\n", attempts);
        }
    } while (guess != number);

    return 0;
}
```

## Explanation:

- The program generates a random number between 1 and 100 using the rand() function with the help of time() for seed initialization.
- The variable guess stores the user's input for the guessed number.
- The attempts variable keeps track of the number of attempts made.
- Inside the do-while loop, the user is prompted to enter a guess.
- Depending on whether the guess is too high or too low, the program provides appropriate feedback.
- If the guess is correct, the loop terminates, and the number of attempts is displayed.

## Output:

Output

```
Guess the number (1-100): 50
Too high
Guess the number (1-100): 35
Too low
Guess the number (1-100): 38
Too low
Guess the number (1-100): 41
Too low
Guess the number (1-100): 46
Too low
Guess the number (1-100): 48
Congratulations! You guessed it right in 6 attempts.
```

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61. Write a program that swaps the values of two variables.
62. Write a program that asks the user to enter a number and then calculates and prints its factorial.

63. Write a program that asks the user to enter a number N and then prints the first N numbers in the Fibonacci sequence
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