gcc program.c # Compiles program.c and generates a default executable named a.out **./a.out** # Runs the compiled program
gcc program.c -o my_program # Compiles program.c and creates an executable named my_program **./my_program** # Runs the compiled program
gcc program.c -o input_program # it takes inputs from input1.txt and displays the result in the terminal. **./input_program < input.txt**
gcc program.c -o io_program **./io_program < input.txt > output.txt** # it takes the inputs from input1.txt and creates the myoutput.txt document and writes the result here.
diff output1.txt myoutput.txt # compares the document output1.txt with the document myoutput.txt.
diff --ignore-all-space output1.txt myoutput.txt # compares the document output1.txt with the document myoutput.txt without ignoring the spaces.

QUESTION: Collatz Conjecture Sequence Length Comparison (Using do-while loop)

Write a C program that:

1. Take two positive integers as input.
2. Generate the Collatz sequence for each number
    a. the sequence starts with a number, and
        i. The number is even; divide it by 2;
        ii. The number is odd; multiply it by 3 and add 1;
        iii. Repeat this process until the number becomes 1.

$$a_n = \begin{cases} \frac{1}{2}\, a_{n-1} & \text{for } a_{n-1} \text{ even} \\ 3\, a_{n-1} + 1 & \text{for } a_{n-1} \text{ odd} \end{cases}$$

3. **PRINT THE STEPS** of the Collatz sequence for both numbers.
4. Calculate and print the **LENGTH OF EACH COLLATZ SEQUENCE** (the total number of terms in the sequence, including the starting number).
5. Compares the lengths of the two sequences and prints which sequence is **LONGER** or if they have the **SAME LENGTH**.

Requirements: The program must use a **DO-WHILE LOOP** to compute the Collatz sequence.

Enter the first number: 20 Enter the second number: 13 Collatz sequence for 20: 20 -> 10 -> 5 -> 16 -> 8 -> 4 -> 2 -> 1 Sequence length: 8 Collatz sequence for 13: 13 -> 40 -> 20 -> 10 -> 5 -> 16 -> 8 -> 4 -> 2 -> 1 Sequence length: 10 The sequence starting with 13 is longer.	Enter the first number: 5 Enter the second number: 10 Collatz sequence for 5: 5 -> 16 -> 8 -> 4 -> 2 -> 1 Sequence length: 6 Collatz sequence for 10: 10 -> 5 -> 16 -> 8 -> 4 -> 2 -> 1 Sequence length: 7 The sequence starting with 10 is longer.