# Question 1: For Loop - Sum Calculation

Write a C program using a **for loop** to calculate and print the sum of all numbers from 1 to 20. The output should display: "The sum of numbers from 1 to 20 is: [result]"

# Question 2: While Loop - Countdown

Write a C program using a **while loop** that asks the user to enter a positive number, then counts down from that number to 1, printing each number on a new line. After reaching 1, print "Blast off!"

# Question 3: Do-While Loop - Input Validation

Write a C program using a **do-while loop** that keeps asking the user to enter a number between 1 and 10. If the user enters a number outside this range, display "Invalid input! Try again." and ask for input again. Once a valid number is entered, print "Thank you! You entered: [number]"

# Question 4: For Loop - Multiplication Table

Write a C program that asks the user to enter a number, then uses a **for loop** to print the multiplication table for that number from 1 to 10. Format: "5 x 1 = 5", "5 x 2 = 10", etc.

# Question 5: While Loop - Digit Counter

Write a C program that asks the user to enter a positive integer, then uses a **while loop** to count and print how many digits are in that number. For example, if the user enters 12345, the output should be "The number has 5 digits."

# Question 6: Loop Comparison Challenge

Write three separate C programs that all print the even numbers from 2 to 20:

- Version 1: Using a **for loop**
- Version 2: Using a **while loop**
- Version 3: Using a **do-while loop**

Which version do you think is most appropriate for this task and why?

# Question 7: For Loop - Factorial Calculation

Write a C program that asks the user to enter a positive integer, then uses a **for loop** to calculate and print the factorial of that number. For example, if the user enters 5, the output should be "The factorial of 5 is: 120" (since 5! = 5 × 4 × 3 × 2 × 1 = 120).

## Question 8: While Loop - Power Calculation

Write a C program that asks the user to enter a base number and an exponent, then uses a **while loop** to calculate and print the result of base raised to the power of exponent. Do not use any built-in power functions.

## Question 9: Do-While vs While - Behavior Analysis

Write two C programs:

- Program A: Uses a **while loop** to print numbers from 1 to 5, but initialize the counter to 6
- Program B: Uses a **do-while loop** to print numbers from 1 to 5, but initialize the counter to 6

Run both programs and explain what happens. What does this demonstrate about the difference between while and do-while loops?

## Question 10: Loop Control - Break and Continue

Write a C program using a **for loop** that:

- Prints numbers from 1 to 20
- Skips printing any number that is divisible by 3 (use continue)
- Stops the loop entirely when it reaches 15 (use break)
- After the loop ends, print "Loop terminated early"

What numbers will be printed by this program?

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## Bonus Challenge Question:

Write a C program that asks the user to enter numbers continuously using a **while loop**. The program should:

- Keep a running total of all positive numbers entered
- Count how many negative numbers were entered
- Stop when the user enters 0
- Finally print: "Sum of positive numbers: [sum]" and "Count of negative numbers: [count]"