

Homework 3 — Looping Structures in C++

Objectives

Practice:

- for loops
 - while loops
 - do...while loops
 - Counter-controlled loops
 - Sentinel-controlled loops
 - Flag-controlled loops
 - Using break and continue
 - Real-world loop applications
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Section A — Basic Loop Practice

1.

Write a program that prints all even numbers between 1 and 50.

2.

Ask the user for a number n , and compute and print the factorial:

$$n! = 1 \times 2 \times 3 \times \dots \times n$$

3.

Write a program that prints the multiplication table (1–10) for any number the user enters.

4.

Count how many numbers from 1 to 100 are divisible by 3, and print the result.

5.

Ask the user to enter 10 integers, then display:

- The largest number
- The smallest number

Section B — Sentinel & Flag Controlled Loops

6. Sentinel-Controlled Loop

Write a program that reads integers until the user enters -1, then prints the count of numbers entered (excluding -1).

7. Flag-Controlled Loop — Number Guessing Game

- Generate a random number from 0 to 100
- Repeatedly ask the user to guess
- Print whether the guess is too high, too low, or correct
- Stop when the user guesses the number correctly

Section C — Real-World Loop Applications

8. Cashier Program

A cashier keeps entering item prices until typing 0.

Print the following:

- Total price
- Number of items
- Average price

9. Pattern Printing

Use nested loops to print the pattern:

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*  
  
**  
  
***  
  
****  
  
*****
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