CSE108 – Computer Programming Lab.

Lab 4

21/03/2025

Part 1. (30 pts) Write a C program that takes a file name as an argument, reads an unknown number of integers from the file, calculates the sum of all even numbers, and prints the result.

Example: Assume "numbers.txt" contains:

12
45
78
23
56

Output: Sum of even numbers: 146

Part 2. (30 pts) Write a C program that takes an integer input from the user, reverses its digits using a loop, and prints the reversed number. The program **must not use** strings such as char[], string, gets(), or scanf("%s") to manipulate or store numbers, nor should it use arrays. **Only** the stdio.h library is allowed, and no other libraries like stdlib.h or string.h can be used. The program **must actually reverse the number** using a loop like while or for instead of simply printing the digits in reverse order.

Example:

Enter a number: 1234

Reversed number: 4321

Enter a number: -987

Reversed number: -789

Part 3. (40 pts) Write a C program that takes an integer input n, representing the number of rows, and prints Pascal's Triangle up to n rows using nested loops. The program should use a function **int binomialCoeff(int n, int k)** to calculate binomial coefficients using factorial. Arrays are not allowed.

The binomial coefficient is calculated as: **C(n, k) = n! / (k! * (n - k)!)**

where n! (n factorial) is the product of all integers from 1 to n. Here, n represents the row number (starting from 0), and k represents the position of the element within that row (starting from 0).

For example, the first two rows of Pascal's Triangle are calculated as follows:

- **Row 0:** C(0,0) = 1 → 1
- **Row 1:** C(1,0) = 1, C(1,1) = 1 → 1 1

Enter number of rows: 5

```
   1
  1 1
 1 2 1
1 3 3 1
1 4 6 4 1
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