Lab 1 (22/08/2025)

1. Basic Arithmetic with Different Data Types

Write a C program to:

- Read two integers, two floating-point numbers, and two characters from the user.
- Compute:
  - Sum and difference of integers
  - Product and quotient of floats
  - ASCII values of characters
- Display the results.

2. Mixed Data Type Operations

Write a C program to:

- Read an int, a float, and a double.
- Compute:
  - Sum of all three numbers (typecast if necessary)
  - Average of all numbers as a double
- Display the computed sum and average with proper formatting.

3. Area and Perimeter Calculations

Write a C program to:

- Read the radius of a circle as float and side of a square as int.
- Compute:
  - Area and circumference of the circle
  - Area and perimeter of the square
- Display all results.

4. Temperature Conversion

Write a C program to:

- Read temperature in Celsius (float)
- Convert it to Fahrenheit and Kelvin using appropriate formulas
- Display all values with 2 decimal places.

5. Salary Calculation with Different Types

Write a C program to:

- Read basic salary (int), HRA (float), DA (double)
- Compute gross salary as double and display it
- Show each component separately.

6. Type Casting and Mixed Expressions

Write a C program to:

- Read two integers and one float
- Compute:
  - Integer division
  - Floating-point division
  - Sum after converting all to double
- Display the results.

7. Simple Interest Calculation

Write a C program to:

- Read principal (float), rate of interest (float), and time in years (int)
- Compute Simple Interest as:
  SI = (P * R * T) / 100
- Display the result with two decimal precision.

8. Average Marks and Grade

Write a C program to:

- Read marks of 5 subjects (integer or float)
- Compute total and average
- Display the grade based on average:
  - >=90 → Grade A
  - >=75 → Grade B
  - Else → Grade C

9. Swapping of Variables using Different Data Types

Write a C program to:

- Read two integers and two floats
- Swap the integers without using a third variable
- Swap the floats using a temporary variable
- Display before and after swapping.

10. Complex Arithmetic with Mixed Types

Write a C program to:

- Accept int a, float b, and double c.
- Calculate:
  - (a * b) + (c / a) - (b * b)
  - (int)(c) % (int)(b)
- Display results with proper precision control using printf specifiers.

11. Integer, Float, Char Formatting

Write a C program to:

Integer Formatting

- Initialize int n = 12345;
- Display the integer in **10 different formats**, such as:
  - Default (%d)
  - With width (%8d)
  - Left-justified (%-8d)
  - With leading zeros (%08d)
  - Signed (%+d)
  - With space for sign (% d)
  - Hexadecimal (%x and %X)
  - Octal (%o)
  - With grouping (manually, like 12,345 using logic)

Float Formatting

- Initialize float f = 123.456789;
- Display in **10 different formats**:
  - Default (%f)
  - With 2 decimal places (%.2f)
  - With 4 decimal places (%.4f)
  - Scientific notation (%e and %E)
  - Fixed width and precision (%10.3f)
  - Left-justified (%-10.3f)
  - With leading zeros (%010.3f)
  - Both values side by side with different widths

Character Formatting

- Read a character c = 'A';
- Display:
  - As character (%c)
  - As integer (ASCII value %d)
  - With padding spaces (%5c)
  - Left aligned (%-5c)

Combine Width and Precision

- Initialize float f = 98.7654;
- Display:
  - %6.2f
  - %8.3f
  - %010.2f
  - %-8.2f

Display Scientific vs Fixed

- Initialize double val = 1234567.89;
- Display:
  - In fixed-point (%f)
  - In scientific (%e)
  - In shortest representation (%g)