CSE 102 Spring 2025 – Computer Programming Assignment 1

Due on March 10, 2025 at 23:59

Part 1. [70pts]

Write a C program to implement a basic calculator that performs four fundamental operations (addition, subtraction, multiplication, and division). However, the calculator contains some errors:

- When selecting addition (+), the program performs subtraction (–).
- When selecting subtraction (–), the program performs multiplication (*).
- When selecting multiplication (*), the program performs addition (+).
- When selecting division (/), the program performs subtraction (–).

The program should execute **four times**, allowing the user to perform four operations. After each operation:

1. Store the correct result of the operation. (Expected result)
2. Store the incorrect result produced by the calculator.(Experimental result)
3. Calculate the error using the formula:

$$Error = |Expected\ Result - Experimental\ Result|$$

$$Error\ Percentage = \left(\frac{Error}{Expected\ Result}\right) x100$$

4. At the end of the program, compute and display the **average error percentage** over all four operations.

Output Format:

Enter an operation (Example: 3+2): 3 + 2

Expected Result: 5.00

Experimental Result: 1.00

Error:4.00

Error Percentage: 80.00%

Enter an operation (Example: 3+2): 6 *4

Expected Result: 24.00

Experimental Result: 10.00

Error: 14.00

Error Percentage: 58.33%

Enter an operation (Example: 3+2): 8 - 5

Expected Result: 3.00

Experimental Result: 40.00

Error:37.00

Error Percentage: 1233.33%

Enter an operation (Example: 3+2): 9 / 3

Expected Result: 3.00

Experimental Result: 6.00

Error:3.00

Error Percentage: 100.00%

Average Error Value: 368.91%

Part 2. [30pts]

Write a program that asks the user to enter the diameter of a circle. Your program prints the surface area using the known formulas:

Area of sphere= $4\pi r^2$ where π=3.14,
For example:

r = 1.0

Area of sphere: 12.56

IMPORTANT NOTES:

- Submit your homework as a zip file named as your name and surname (name_surname.zip) and this file should include: name_surname.c file, name_surname.pdf file which includes, screenshots of your generated outputs and given C code as an input.
- Programs with compilation errors will get 0.
- Do not use any library other than stdio.h.
- **Do not use** loops or case statement in this assignment
- The output format must be as given, do not change it.
- Compile your work with given command “gcc --ansi your_program.c -o your_program”.
- Your work will be evaluated using gcc version 11.4.0.