CS 226
Computer Organization and Design
Fall 2024

Assignment #7
Floating-Point

Due Date: Friday, November 22 2024 @ 11:59 PM

In this assignment, you will write a sequential assembly language program to convert a temperature defined in Fahrenheit degrees to Celsius. The formula to be implemented is

$$C = (F - 32) \times {}^{5}/_{9}.$$

For this assignment, pseudoinstructions are ***not*** to be used and the setting in RARS should be set to not allow pseudoinstructions.

Define the following values in the data segment as indicated:

1.	F_temp	(.float)	Assign an initial value for this data item
2.	C_temp	(.float)	This value is initialized to zero.
3.	The value 32	(.byte)	
4.	The value 5	(.byte)	
5.	The value 9	(.byte)	

In the text segment of the program, create the instruction sequence to implement the temperature conversion equation. Load values into appropriate registers, apply necessary conversions, implement the equation, and store the result into memory.

This program does not call for loops, subroutines or the use of the stack. The resulting program will be sequential instructions leading to the calculated value.

Document your program with the required header comments, register usage, and other comments in your program as necessary. After successfully running your program, create a memory dump and label **all** the individual values in the memory.

What to submit on Blackboard:
1. A copy of your program as an assembly language program file (.asm).
2. A labeled memory dump indicating all memory values (.txt).

Grading criteria:

1.	Header comments and register usage section	5 points
2.	Correct data segment definitions described in the assignment	5 points
3.	Correct use of general purpose and floating-point registers	15 points
4.	Correct arithmetic calculation (including conversions)	15 points
5.	Storing result to correct memory location	5 points
6.	Use of appropriate comments in code	5 points
7.	Memory dump with labels	10 points
	Total points	60 points