Assignment 5

CAAM 519 Fall 2021

due Monday November 22 at 11:59pm

This assignment is a continuation of our in class example on implementing a struct for vectors. The goal is for you to implement three vector operations within this struct. (35 pts)

- First fork our class git repository: https://github.com/msarrafj/caam-519-f21-test to your account. Then clone it to have it locally on your machine.
- Make your own branch called hw5_firstname_lastname and switch to it.
- On this branch, have a look at the vector struct source files in the directory vector_struct_example. The code is incomplete. You should implement the following three functions:

vector_addition for adding two vectors

vector_dot_product for taking the dot product of two vectors

vector_scalar_multiplication for multiplying a vector by a scalar

In the implementation of these functions, think carefully about what conditions you might want to check before these operations are performed.

- Implement a main function in another source file called main_vector_struct.c that constructs vectors $\boldsymbol{v} = (-1, 5, 2, 3)^T$ and $\boldsymbol{w} = (1, -1, 1, -2)^T$. Use the functions you implemented to compute $\boldsymbol{v} - \boldsymbol{w}$ and $\boldsymbol{v} \cdot \boldsymbol{w}$ and output the results to the terminal.
- Put your code through valgrind to make sure there are no memory leaks.
- Write a Makefile to automate and optimize the compilation process.
- Push your code to a remote version of your branch and put in a pull request titled "firstname lastname hw5."