EE3015: Assignment 1

You are NOT allowed to share your original script file/code or consult your peer's files.
We will be using plagiarism checking tools for checking similarity, Copying is strictly prohibited and will attract strict penalties, including a fail grade.
Strictly follow the guidelines for submitting assignments, if not your assignments will not be evaluated

Write C code with functions Convolution, Correlation, Upsampling, Downsampling

Problem 1: Convolution between a and b.

a = [0.256258710002038 0.963365491187825 -0.743741290000000
0.963365491190122
0.256258709998790 -0.450848071183266 1.25625871000000 -0.450848071189536
0.256258710000382 0.963365491183852 -0.743741290000000 0.963365491188951
0.256258710000446 -0.450848071184437 1.25625871000000 -0.450848071188365]

b = [0.256258710000824 -0.299311523023751 1.18013824251201
-0.724526570403471
0.963365491184473 0.0611683879836982 -0.126424722362053 1.08772832230303
-0.743741290000000 1.08772832230147]

Problem 2: correlation between a and b.

a = [-8.31662009587695e-13 0.634029328751641 -0.767445067471676
1.21423064425930 -0.398089786809545 0.577773754381422 0.836673932101677
-0.308971047587158 1.58778525229245 -0.182021563971272]

b = [0.256258710000824 -0.299311523023751 1.18013824251201
-0.724526570403471
0.963365491184473 0.0611683879836982 -0.126424722362053
1.08772832230303 -0.743741290000000 1.08772832230147]

Problem 3: Downsample sequence x with factor = 4

x[n] = [0 1.0098 0.1732 1.5000 0.6928 0.4902 0.0000 -0.4902 -0.6928 -1.5000
-0.1732 -1.0098 -0.0000 1.0098 0.1732 1.5000 0.6928 0.4902 0.0000 -0.4902
-0.6928 -1.5000 -0.1732 -1.0098 -0.0000 1.0098 0.1732 1.5000 0.6928 0.4902
-0.0000 -0.4902 -0.6928 -1.5000 -0.1732 -1.0098] (36 samples)

Problem 4: Upsample sequence x with factor = 3

X[n] = [0 0.3890 0.7780 1.1670 1.5560 1.9450 2.3340 2.7230 3.1120 3.5010 3.8900 4.2790 4.6680 5.0570 5.4460 5.8350 6.2240] (17 samples)

Instructions :

- All functions should work with any length of input sequences (generalized)
- In the main method, you should only take inputs and print outputs, all the other operations should be done in functions

What to upload:

- Upload only C file with your Id which includes the main method and four functions (convolution, correlation, upsampling, downsampling)
  Ex: EE18MTECH11026_A1.c

Note :

"*Please start with smaller input sequences (any) make sure it's working then generalize and apply on given sequences"*