CS 412/512 - Homework #2

Due To

22 March 2022 Tuesday, by 11.59 pm.

To Do

Write appropriate functions in (Java or Python) language for the following problems:

Median String Problem (2B):
Find a median string.

Input: A collection of strings Dna, and integer k.
Output: A k-mer Pattern minimizing d(Pattern, Dna) among all possible choices of k-mers.

Greedy Motif Search (2D):
Find a motif matrix minimizing SCORE(Motifs) among all possible choices of k-mers using Greedy strategy.

Input: A collection of strings Dna, and integers k and t.
Output: A Profile-most probable motif matrix in Dna.

Randomized Motif Search (2F):
Find a motif matrix minimizing SCORE(Motifs) among all possible choices of k-mers using Randomized algorithms.

Input: A collection of strings Dna, and integers k and t.
Output: A Profile-most probable motif matrix in Dna.

Gibbs Sampling Motif Search (2G):
Find a motif matrix minimizing SCORE(Motifs) among all possible choices of k-mers using Gibss Sampling.

Input: A collection of strings Dna, and integers k and t.
Output: A Profile-most probable motif matrix in Dna.

Rules

- You are not allowed to use any external libraries and/or functions. Everything must be implemented by you from scratch.

- Submit ".py" or ".java" file. Any other type of file (such as .ipnyb and etc) will be disregarded.

- It is your responsibility to make sure that you code runs without any type of errors. If your code does not compile or run you will not get any points.

- Any type of plagiarism will not be tolerated. Your submitted codes will be compared with other submissions and also the codes available on internet and violations will have a penalty of -100 points. (In case of copying from another student both parties will get -100)

- Please submit your code using the specified file name as "HW#_YourName_YourSurname.(py/java)" for instance for homework 1, it would be "HW1_Jane_Johnson.py" or "HW1_James_Johnson.java"