

CS302 - Design and Analysis of Algorithm
Fall 2020

Project Description

Submission: Within one week after the conclusion of Final Exam. In case of delay in final exams, submission is 2nd week of Jan 2021

Total Marks: 10. You need to work as a Group of 2 members (Same as Assignment 3)

In this project, you are required to

- 1) Implement the following dynamic programming algorithms from assignment # 3. [2.5 marks]
 - a. Longest Common Subsequence
 - b. Shortest Common Supersequence
 - c. Levenshtein Distance (edit-distance)
 - d. Longest Increasing Subsequence
 - e. Matrix Chain Multiplication (Order finding /paranthesization)
 - f. 0-1-knapsack-problem
 - g. Partition-problem
 - h. Rod Cutting Problem
 - i. Coin-change-making-problem
 - j. Word Break Problem
- 2) Generate 10 sample inputs for each of the above mentioned problems and store them in a txt/csv file. The format should be as: [2 marks]
 - a. Two sequences by using alphabets of your name in random order and repetition with the random length from 30 to 100 characters. e.g. name AHMAD ALI (AIIIMHHMMAALLLAAAIIDAHHHAAAIILL)
 - b. Same as a.
 - c. Same as a.
 - d. A sequence of n random numbers from 0 to 100 (n varies from 30 to 100).
 - e. Same as d.
 - f. Generate a set of n points (n is a random number varying from 10 to 100) with weights and values ranging from 1 to 100. The capital W is the last three digits of your roll number. E.g. for roll number 18K-1123, the W will be 123.

- g. Same as d.
 - h. Same as f with W as rod length, weights as lengths and values as price.
 - i. Same as d with desired change as the last three digits of your roll number.
 - j. A set of randomly generated strings from alphabets a to z as S and your full name, in small letters and without space, as Input for word break.
- 3) Apply these algorithms on the input datasets [1.5 marks].
- 4) You need to show a very nice user interface where user can select any input files (assumed valid) then the input will be shown to the user. The user will be able to select the algorithm (valid algorithms only) on that input. [2 marks]
- 5) You are required to submit strictly a 4-page report (maximum 18% similarity) with the following sections. [2 marks]
- a. Abstract
 - b. Introduction
 - c. Your proposed system (make a clear diagram of your system here along with discussion)
 - d. Experimental Setup (The details of each input dataset including values of random numbers generated)
 - e. Results and Discussion (Here, show results from benchmarks i.e. minimum solution obtained using various files)
 - f. Conclusion
 - g. References