

IIIT Vadodara

CS263: Assignment #3

Divide & Conquer

October 11, 2021

Problem 1

John wants to put everything in its proper order. He follows his rule that all numbers must be arranged in ascending sequence. Unfortunately, this isn't always the case. A "violation" circumstance, according to him, is one in which a lower number appears after a greater number in the collection, violating the ascending order. Determine the total number of such violations given a set of integers.

Problem 2

You arrive at Disney Land, where you can participate in various activities and games. Each activity or game has different costs. You can choose only one activity. You've been given a set C of n coins in various values $(c_1, c_2, c_3, \dots, c_n)$. Try to find the fewest number of coins to pay for your activity.

Important Points:-

- You have to write a recursive algorithm for all the problems. Write the recurrence relation and give upper bound for algorithm by any approach (iterative, substitution, or recursion tree).
- If you find the problem can be solved recursively in more than one way or you can improve your recursive algorithm, then do so and compare their time complexities. Write all your proposed algorithms.
- Implement it using any language.
- Save your file as CourseName_Roll_no.pdf.
- Save your source file as CourseName_roll_no(.c, .java, .cpp, .python)
- Submit a pdf file which will consist of the problem statement, algorithm, Time complexity (with explanation), your code, results, and analysis (Run at least 5 times for different inputs.)
 - Screen sort of you code
 - screenshot of all your output
- If it is a single file then submit only one file otherwise make a zip file and submit as courseName_Roll_No.zip for the code.