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| **WEEK-12** | **GREEDY ALGORITHM** |
| Q1) Suppose you were to drive from Akshardham to JIIT-62 along NH-24. Your gas tank, when full, holds enough gas to travel m miles, and you have a map that gives distances between gas stations along the route. Let d1 < d2 < \_ \_ \_ <dn be the locations of all the gas stations along the route where di is the distance from Akshardham to the gas station. You can assume that the distance between neighboring gas stations is at most m miles. Your goal is to make as few gas stops as possible along the way. Implement the most efficient algorithm you can find to determine at which gas stations you should stop. Be sure to give the time complexity of your algorithm as a function of n.  Q2) Suppose you want to schedule final exams and, being very considerate, you want to avoid having a student do more than one exam a day. We shall call the courses 1,2,3,4,5,6,7. In the table below a star in entry ij means that course i and j have at least one student in common so you can't have them on the same day. What is the least number of days you need to schedule all the exams? Implement an algorithm to schedule the exams.  Q3) You are given n (user inputted say 20) steel rods of length m meters (user inputted say 40 meters). It is desired to cut the steel rods as per following requirements:  n1 number of m1 meters (say 20 numbers of 12 meters long)  n2 number of m2 meters (say 40 numbers of 10 meters long)  n3 number of m3 meters (say 10 numbers of 6 meters long)  n4 number of m4 meters (say 25 numbers of 4 meters long)  Give an efficient algorithm to perform above task.  Q4) Denomination of coins and amount to be changed are to be inputted by the user. Propose an algorithm to give minimum coins needed to get the amount changed. For example, denominations of coins are 1, 5, 10, 20, 50, and 100 and the amount to be changed is 647 then minimum coins needed is 11 (6 x 100, 2 x 20, 1 x 5, and 2 x 1).  Q5) Suppose you have to schedule lab hours for seven students named as A, B, C, D, E, F, and G such that each student will use individually one computer for one hour. Following table indicates availability of a student in different time slots starting from 7 AM to 12 Noon. A star in the table means a student is present at that time. Propose an algorithm to identify minimum number of computers necessary. | |