

CS207-ALGORITHMS LAB

Lab 6

NOTE:

- This lab is to be completed individually. Do not share your work or code with anyone else.
 - You can use any programming language that you like; we suggest Python, C++, or C.
 - For all of our labs, please avoid using Google to find suggestions or solutions. The goal is to use your own brain to work these problems out, which will help you develop the skills to do well in the exams and, more importantly, become a substantially better computer programmer.
 - Save your work in your N-drive.
 - You have to make lab report in hard copy.
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Problem 6 Write a program to find the solution for job sequencing with deadlines problems. Take input from the class example to test your code.

Description:

Job sequencing is the set of jobs, associated with the job i where deadline $d_i \geq 0$ and profit $p_i > 0$. For any job i the profit is earned if and only if the job is completed by its deadline. To complete a job, one has to process the job on a machine for one unit of time. Only one machine is available for processing the jobs

Algorithm for job sequencing

Input: A is the array of jobs with deadline and profit S array will be the output.

1. Begin
2. Sort all the jobs based on profit P_i so
3. $P_1 > P_2 > P_3 \dots \dots \dots \geq P_n$
4. d = maximum deadline of job in A
5. Create array $S[1, \dots \dots \dots, d]$
6. For $i=1$ to n do
7. Find the largest job x
8. For $j=i$ to 1
9. If $((S[j] = 0) \text{ and } (x \text{ deadline} \leq d))$
10. Then
11. $S[x] = i$;
12. Break;
13. End if
14. End for
15. End for
16. End

Procedure:

Steps for performing job sequencing with deadline using greedy approach is as follows:

1. Sort all the jobs based on the profit in an increasing order.
2. Let α be the maximum deadline that will define the size of array.
3. Create a solution array S with d slots.
4. Initialize the content of array S with zero.
5. Check for all jobs.
 - a) If scheduling is possible a lot ith slot of array s to job i.
 - b) Otherwise look for location (i-1), (i-2)...1.
 - c) Schedule the job if possible else reject.
6. Return array S as the answer.
7. End.