Problem Statement

CODE with proper comments

Problem Statement:

In the single-machine scheduling problem, we are given a set of n jobs J. Each job i has a deadline di and profit pi. We have n jobs to execute, each one of which takes a unit time to process. At any time instant, we can do only one job. Doing a job i earns a profit pi. The deadline for a job i is di. Generate an optimized solution to select the set of mutually compatible jobs and which maximize the total profit generated by the machine.

A **Simple Solution** is to generate all subsets of a given set of jobs and check individual subsets for the feasibility of jobs in that subset. Keep track of maximum profit among all feasible subsets. The time complexity of this solution is exponential.

1. **Input: No of Jobs, Finishing time, Profit Associated with them (Minimum 5 inputs)**
2. **Output: Order of jobs performed with associated profit, Time required, No of jobs completed and maximum profit.**
3. **Table:**

No of jobs	Greedy approach (Execution Time (sec)	maximum profit (kg)	No of jobs completed (JObs)	Without Greedy Approach (Naïve approach) Time required(sec)	Maximum profit (kg)	No of jobs completed
5	30	45	J1,j2,j3			
10	40	20				
15						

4. **Graph**
5. **Analysis for your result (One paragraph)**

Job Sequencing

Let us consider, a set of n given jobs which are associated with deadlines and profit is earned, if a job is completed by its deadline. These jobs need to be ordered in such a way that there is maximum profit.

It may happen that all of the given jobs may not be completed within their deadlines.

Assume, deadline of $\mathbf{i^{th}}$ job J_i is d_i and the profit received from this job is p_i. Hence, the optimal solution of this algorithm is a feasible solution with maximum profit.

Thus, D(i)>0 D(i)>0 for 1⩽i⩽n1⩽i⩽n.
Initially, these jobs are ordered according to profit, i.e. p1⩾p2⩾p3⩾...⩾pn

Q1

Job	J_1	J_2	J_3	J_4	J_5
Deadline	2	1	3	2	1
Profit	60	100	20	40	20

Solution

Job	J_2	J_1	J_4	J_3	J_5
Deadline	1	2	2	3	1
Profit	100	60	40	20	20

J2,j1,j3

=100+60+20=180

Q2

Job	J_1	J_2	J_3	J_4

Deadline	2	1	3	1
Profit	200	40	60	15

Q3

Job	**J_1**	**J_2**	**J_3**	**J_4**	**J_5**	**J_6**
Deadline	7	4	2	2	2	1
Profit	100	90	80	70	60	50