Practical No. : 3

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Aim : Implement Job Scheduling Problem using Greedy Search Algorthm.
Code :

```
class Job:
    def __init__(self, id, deadline, profit):
        self.id = id
        self.deadline = deadline
        self.profit = profit

# Function to schedule jobs to maximize profit
def jobScheduling(jobs, n):
    # Sort the jobs based on profit in descending order
    jobs.sort(key=lambda x: x.profit, reverse=True)

    # Find the maximum deadline to create a timeline for scheduling
    max_deadline = max(job.deadline for job in jobs)

    # Initialize a timeline where each slot is free (None)
    timeline = [None] * (max_deadline + 1)

    # Keep track of the total profit
    total_profit = 0

    # List to store the scheduled jobs
    scheduled_jobs = []

    # Try to schedule jobs
    for job in jobs:
        # Find a free slot before the job's deadline
        for t in range(job.deadline, 0, -1):
            if timeline[t] is None:    # If the slot is free
                timeline[t] = job.id    # Schedule the job
                total_profit += job.profit    # Add its profit to total profit
                scheduled_jobs.append(job.id)    # Add job id to the list
                break

    return scheduled_jobs, total_profit

if __name__ == "__main__":
    # Take the number of jobs as input
```

```
n = int(input("Enter the number of jobs: ").strip())

jobs = []

# Take job details from the user
for i in range(n):
    job_id = input(f"Enter job ID for job {i + 1}: ").strip()
    deadline = int(input(f"Enter the deadline for job {job_id}: ").strip())
    profit = int(input(f"Enter the profit for job {job_id}: ").strip())
    jobs.append(Job(job_id, deadline, profit))

# Get the scheduled jobs and the total profit
scheduled_jobs, total_profit = jobScheduling(jobs, n)

print(f"Scheduled Jobs: {scheduled_jobs}")
print(f"Total Profit: {total_profit}")
```

Output:

```
Enter the number of jobs:    5
Enter job ID for job 1:    p1
Enter the deadline for job p1:    2
Enter the profit for job p1:    100
Enter job ID for job 2:    p2
Enter the deadline for job p2:    1
Enter the profit for job p2:    19
Enter job ID for job 3:    p3
Enter the deadline for job p3:    2
Enter the profit for job p3:    27
Enter job ID for job 4:    p4
Enter the deadline for job p4:    1
Enter the profit for job p4:    25
Enter job ID for job 5:    p5
Enter the deadline for job p5:    3
Enter the profit for job p5:    15
Scheduled Jobs: ['p1', 'p3', 'p5']
Total Profit: 142
```