Homework Assignment: 3
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1. Job Optimization

   (a)

Solution	Time Slot 1	Time Slot 2	profit
1	Job 1	Job 3	55
2	Job 3	Job 1	55
3	Job 2	Job 1	65
4	Job 2	Job 3	60
5	Job 4	Job 1	70
6	Job 4	Job 3	65
7	Job 1	N/A	30
8	Job 2	N/A	35
9	Job 3	N/A	25
10	Job 4	N/A	40

   (b) The optimal schedule has Job 4 in timeslot 1 and Job 1 in timeslot 2 for a profit of $70.

   (c) A high level greedy algorithm would choose the largest profit with a deadline of 1 or 2, then choose the largest profit with a deadline of 1. In this case, it would choose Job 4, then Job 1.

2. Dynamic Programming: Change Making

   (a) The minimum number of coins needed to meet the amount is 3.

   (b) Minimum coin combinations include {1, 2, 5} and {3, 3, 3}

   (c)

n	0	1	2	3	4	5	6	7	8	9
$f(n)$	0	1	2	1	2	1	2	3	2	3

   (d)

```
Change-making(D[j], n):
    f[0] = 0
    for i = 1 to n do
        temp = -1
        j = 1
        while j <= m and i >= D[j] do
            temp = min(f(i-D[j]),
            j = j + 1
        f[1] = temp + 1
    return f(n)
```

3. Dyanmic Programming: Knapsack Problem

   (a)

   (b)

   (c)

4. Greedy Algorithm

   (a)

   (b)

   (c)