CS 313E (Mitra) **Weighted Job Scheduling**

A job is characterized by {Start Time, Finish Time, Profit}. Given a set of jobs chose a subset of jobs that are non-overlapping with maximum profit.

Step 1: Organize the jobs by ascending order of Finish Time.

Job 1: {1, 2, 50}
Job 2: {3, 5, 20}
Job 3: {6, 27, 100}
Job 4: {2, 100, 200}

The maximum profit is 250 by scheduling jobs 1 and 4 by inspection (brute force).

Consider the following jobs now:
J1: {1, 3, 2}
J2: {2, 5, 4}
J3: {3, 6, 4}
J4: {2, 9, 7}
J5: {7, 10, 2}
J6: {8, 11, 1}

i	0	1	2	3	4	5	6
J[i]	(0, 0)	(1, 3)	(2, 5)	(3, 6)	(2, 9)	(7, 10)	(8, 11)
P[i]	0	2	4	4	7	2	1
M[i]	0	2	4	6	7	8	7
B[i]	0	1	2	1	4	3	3

P[i] ≡ Profit for i^{th} job
M[i] ≡ Maximum profit so far for i^{th} job
Initialize M[i] with P[i] to start with
B[i] ≡ Index of last job used to obtain maximum profit

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for i in range (1, n + 1):
        for j in range (0, i):
                if (not_overlap (J[i], J[j])):
                        M[i] = max {M[i], M[j] + P[i]}
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Optimal Profit = 8
Optimal Job Sequence = {J1, J3, J5}

Consider the following jobs now. Find the maximum profit and the set of non-overlapping jobs that maximizes your profit.

A: {4, 7, 2}
B: {1, 4, 3}
C: {5, 9, 4}
D: {6, 8, 7}
E: {7, 10, 8}
F: {2, 6, 6}

i	0	1	2	3	4	5	6
J[i]	(0, 0)						
P[i]	0						
M[i]	0						
B[i]	0						