#### More dynamic programming

9/30/24

#### Administrivia

- HW 3 (multithreading) due tomorrow
- Read Section 14.4 for Wednesday
- Exam 1 out Wednesday
  - Multi-day takehome
  - Open notes and book, closed internet and friends
  - No class next Thursday (10/3)
  - Due early the next week (probably Monday night)
  - Everything thru multithreaded (induction, asymptotic ordering, AVL trees, D&C, multithreaded)

Each week, a consultant is offered a high-stress job and a low-stress job. The payoff for these jobs in week i is  $h_i$  and  $l_i$  respectively. In order to prepare for a high-stress job, the consultant must go on vacation the week before, not performing either job that week.

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What is the maximum total payoff for these jobs?

i	1	2	3	4
h <sub>i</sub>	12	17	20	22
l <sub>i</sub>	12	9	10	10

- A. 41
- B. 42
- C. 43
- D. 45
- E. None of the above

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Give an algorithm to find the sequence of jobs to complete that maximize the total payoff.

Once you're successful, you start operating with clients in both New York and San Francisco. Each month, you need to decide where to set up your office. For month i, it costs N<sub>i</sub> to operate in New York and S<sub>i</sub> to operate in San Francisco. In addition, each time you move offices, it costs M.

Give an algorithm to find the minimum cost sequence of office locations.

An ordered graph is a directed graph with vertices  $v_1$ ,  $v_2$ , ...,  $v_n$  where (i) every edge is directed from the lowered numbered vertex to the higher-numbered, and (ii) every node other than  $v_n$  has at least one edge leaving it.

Give an algorithm to find the longest path (most edges) starting at  $v_1$ .