

✓ For which of the following will you always find the same solution, even if you re-run the algorithm multiple times? \*1/1

Assume a problem where the goal is to minimize a cost function, and every state in the state space has a different cost.

- ☐ Steepest-ascent hill-climbing, each time starting from a different starting state
- ☒ Steepest-ascent hill-climbing, each time starting from the same starting state ✓
- ☐ Stochastic hill-climbing, each time starting from a different starting state
- ☐ Stochastic hill-climbing, each time starting from the same starting state
- ☐ Both steepest-ascent and stochastic hill climbing, so long as you always start from the same starting state
- ☐ Both steepest-ascent and stochastic hill climbing, each time starting from a different starting state
- ☐ No version of hill-climbing will guarantee the same solution every time

The following two questions will both ask you about the optimization problem described below.

A farmer is trying to plant two crops, Crop 1 and Crop 2, and wants to maximize his profits. The farmer will make \$500 in profit from each acre of Crop 1 planted, and will make \$400 in profit from each acre of Crop 2 planted.

However, the farmer needs to do all of his planting today, during the 12 hours between 7am and 7pm. Planting an acre of Crop 1 takes 3 hours, and planting an acre of Crop 2 takes 2 hours.

The farmer is also limited in terms of supplies: he has enough supplies to plant 10 acres of Crop 1 and enough supplies to plant 4 acres of Crop 2.

Assume the variable  $C1$  represents the number of acres of Crop 1 to plant, and the variable  $C2$  represents the number of acres of Crop 2 to plant.

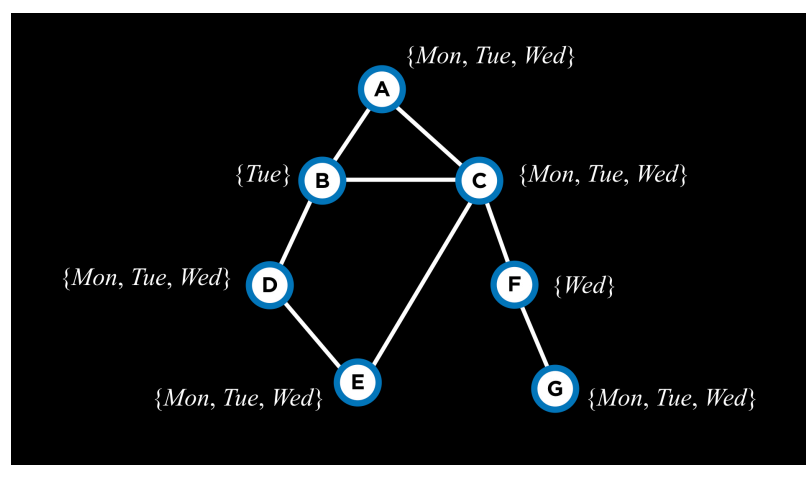
✓ What would be a valid objective function for this problem? \*1/1

- ☒  $500 * C1 + 400 * C2$  ✓
- ☐  $10 * C1 + 4 * C2$
- ☐  $-3 * C1 - 2 * C2$
- ☐  $C1 + C2$
- ☐  $500 * 10 * C1 + 400 * 4 * C2$

✓ What are the constraints for this problem? \*1/1

- ☒  $3 * C1 + 2 * C2 \leq 12, C1 \leq 10, C2 \leq 4$  ✓
- ☐  $3 * C1 + 2 * C2 \leq 12, C1 + C2 \leq 14$
- ☐  $3 * C1 \leq 10, 2 * C2 \leq 4$
- ☐  $C1 + C2 \leq 12, C1 + C2 \leq 14$

The following question will ask you about the below exam scheduling constraint satisfaction graph, where each node represents a course. Each course is associated with an initial domain of possible exam days (most courses could be on Monday, Tuesday, or Wednesday; a few are already restricted to just a single day). An edge between two nodes means that those two classes must have exams on different days.



✓ After enforcing arc consistency on this entire problem, what are the resulting domains for the variables C, D, and E? \*1/1

- ☐ C's domain is {Mon}, D's domain is {Tue}, E's domain is {Wed}
- ☐ C's domain is {Mon, Tue}, D's domain is {Wed}, E's domain is {Mon}
- ☐ C's domain is {Mon, Tue, Wed}, D's domain is {Mon, Wed}, E's domain is {Mon, Tue, Wed}
- ☐ C's domain is {Mon}, D's domain is {Wed}, E's domain is {Tue}
- ☐ C's domain is {Mon}, D's domain is {Mon, Wed}, E's domain is {Mon, Tue, Wed}

☒ C's domain is {Mon}, D's domain is {Mon, Wed}, E's domain is {Tue, Wed} ✓