

# Assignment 3

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## 1 Exercise 3.25 (last question)

Q: The **heuristic path algorithm** (Pohl, 1977) is a best-first search in which the evaluation function is  $f(n) = (2 - w)g(n) + wh(n)$ . What kind of search does this perform for  $w = 0$ ,  $w = 1$ , and  $w = 2$ ?

A:  $w = 0$ : Uniform Cost Search

$w = 1$ : A\* Search

$w = 2$ : Greedy Best First Search

## 2 Exercise 4.1: (a) and (d)

Q: Give the name of the algorithm that results from each of the following special cases:

a. Local beam search with  $k = 1$ .

d. Simulated annealing with  $T = \infty$  at all times.

A: a. Hill climbing search.

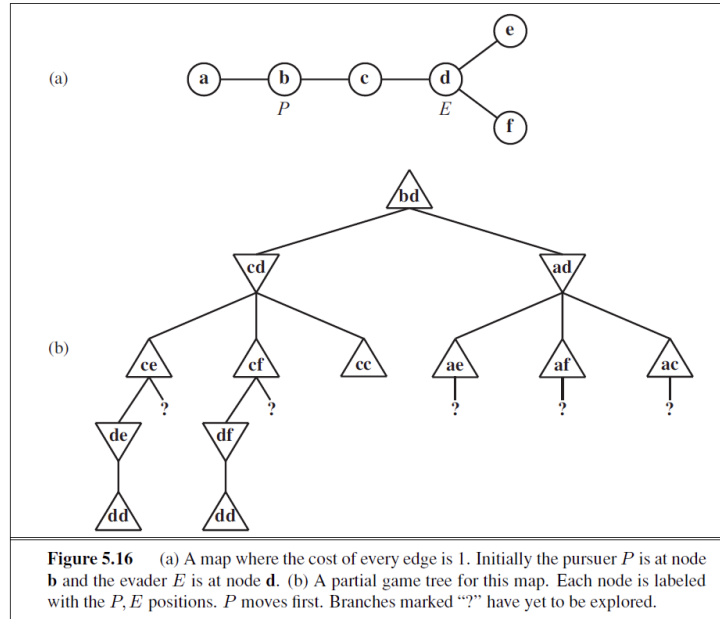
d. Random walk

## 3 Exercise 5.3: (a), (b), and (c)

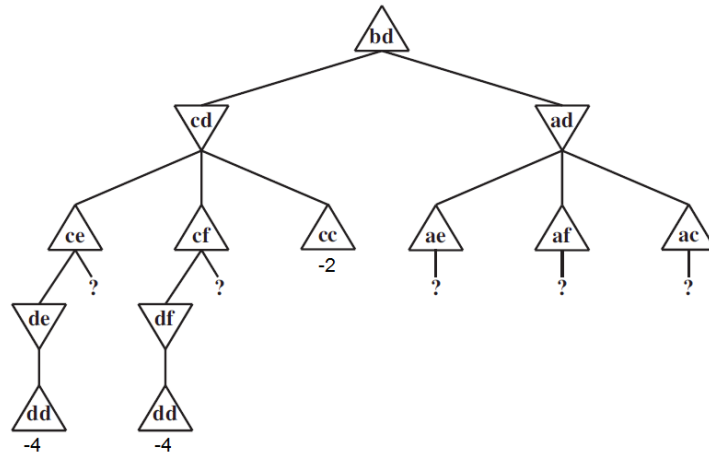
Q: Imagine that, in Exercise 3.3, one of the friends wants to avoid the other. The problem then becomes a two-player **pursuit-evasion** game. We assume now that the players take turns moving. The game ends only when the players are on the same node; the terminal payoff to the pursuer is minus the total time taken. (The evader “wins” by never losing.) An example is shown in Figure 5.16.

a. Copy the game tree and mark the values of the terminal nodes.

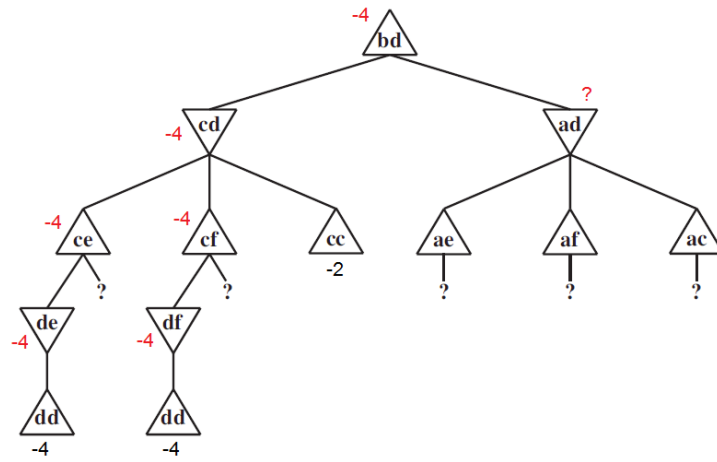
- b. Next to each internal node, write the strongest fact you can infer about its value (a number, one or more inequalities such as " $\geq 14$ ", or a "?").
- c. Beneath each question mark, write the name of the node reached by that branch.



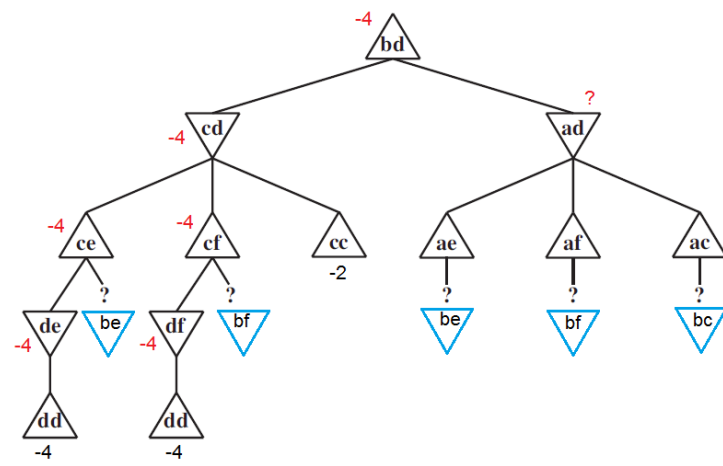
A:



a.



b.



c.