



1. Give the order in which Dijkstra’s Algorithm would visit each vertex starting from vertex A, where “visiting a vertex  $v$ ” means “relaxing all of the edges out of  $v$ .”

A    B    C    D    F    H    G    E

2. Change one of the weights in the graph so that the shortest paths tree returned by Dijkstra’s is not correct. *Hint:* We showed in class that Dijkstra’s shortest paths tree is correct so long as all edges are non-negative.

Set the weight of the edge connecting vertex E and vertex H to the integer weight  $\leq -3$ .

3. Suppose we use the following heuristic.

$$h(A, G) = 2$$

$$h(B, G) = 2$$

$$h(C, G) = 20$$

$$h(D, G) = 2$$

$$h(E, G) = 6$$

$$h(F, G) = 2$$

$$h(G, G) = 0$$

$$h(H, G) = 2$$

Recall that A\* search is just Dijkstra’s algorithm, except that the priority of a vertex  $v$  is given by the sum of the distance from the source to  $v$  plus  $h(v, G)$ , and also that we stop the search when the target is visited.

Give the **path** (not order visited) that A\* search returns from A to G. You may not need all blanks.

A    B    H    \_\_\_\_\_    G