Feedback — Exercise 5.1

You submitted this quiz on **Wed 27 Nov 2013 12:34 PM PST**. You got a score of **10.00** out of **10.00**.

Consider a variation of the 8-puzzle game in which:
- the initial state is the state shown below.
- the goal value for the player in a state is 10 times the number of tiles (numbers 1 through 8) correctly positioned, or 100 if the puzzle is solved (i.e. all tiles are correctly positioned).
- the game will end after exactly two steps, whatever happens (in particular, the game does not immediately end if the puzzle is solved).
- the player has to move at each step ("noop" is not a legal action).

1	2	3
4	5	6
7		8

Question 1

(2 points) What is the player's reward in this state (the goal value for the player if this state were terminal)?

Your Answer		Score	Explanation
0			
10			
20			
30			
40			
50			
60			
70	✔	2.00	7 tiles are correctly positioned.

80			
90			
100			
Total		2.00 / 2.00	

Question 2

(2 points) What is the utility of this state (the highest goal value the player can achieve from this state)?

Your Answer		Score	Explanation
0			
10			
20			
30			
40			
50			
60			
70	✔	2.00	There is no way to solve the puzzle by moving exactly twice, so the best the player can achieve is to move the empty tile anywhere and then move it back again.
80			
90			
100			
Total		2.00 / 2.00	

Question 3

(2 points) How many nodes are in the game tree from here to the end (the complete game tree)?

Your Answer		Score	Explanation
4			
5			
9			
12	✔	2.00	The complete game tree contains: - The initial node. - Three nodes at depth 1: one for for each direction you can move the empty space to (left, up, right). - 2 + 4 + 2 nodes at depth 2: respectively 2, 4 and 2 for the branches where the player initially moved left, up and right. Total: 1 + 3 + 2 + 4 + 2 = 12
17			
Total		2.00 / 2.00	

Question 4

(2 points) How many distinct states are in the game tree?

Your Answer		Score	Explanation
4			
5			
9	✔	2.00	The sequences of moves: (left then right), (up then down) and (right then left) all lead to the same state. Therefore: nDistinctStates = nNodes - 2 = 12 - 2 = 10

			Strictly speaking, this duplicate state is different from the original state because the player has no moves left. To be consistent with our initial answer though, we also accept the answer 9 if you considered the initial state was also a duplicate.
10			
12			
17			
Total		2.00 / 2.00	

Question 5

(2 points) What is the *maximum* number of nodes examined by a player using compulsive deliberation during this game?

Your Answer		Score	Explanation
4			
5			
9			
12			
17	✔	2.00	12 nodes are examined on the first move (total number of nodes in the game tree in the initial state). If the player moved up, then 5 nodes are examined on the second move.
Total		2.00 / 2.00	