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CS182

Question 1

The Pac-Man board will show an overlay of the states explored and the order in which they were explored. (Brighter red means earlier exploration.) Is the exploration order the one you would have expected? Does Pac-Man actually go to all the explored squares on his way to the goal?

In BFS, this makes sense in the order it is implemented because we see a lot of bright red near the beginning which means that it expanded all the nodes at a given depth before going onto a next depth. In DFS, we see a lot of red concentrated on the deepest path because it makes sense with how DFS should work. It does not go through all of the explored squares, however, because it only follows the goal path it discovers through expanding.

Question 2

With regards to question 4 in the implementation of A* as specified by question 4 on the Berkeley search project page: Run the A* agent on openMaze. How do A* and UCS perform with this configuration?

Both do equally well in this configuration

Question 3

Describe a real world problem for which you would want to find an optimal solution. Briefly explain why (3-4 sentences).

An example of a problem would be the knapsack problem, in which we are given a set of items, each with a mass and a value, determine the number of each item to include in a collection so that the total weight is less than or equal to a given limit and the total value is as large as possible. This is essentially a maximization-minimization problem and only the optimal search solution would work best for this. If we are trying to fit as many valuable things into a bag as possible with as little weight as possible, we really need to find the optimal arrangement, and nothing else would be useful for us in that situation.

Question 4

Describe a real-world problem for which you would prefer finding a solution quickly, even if it is suboptimal. Briefly explain why (3-4 sentences).

In the real world, we do not really need to get the perfect center of a bullseye when we play. Instead, being within the range of the top-scoring circle is enough to give us a satisfying solution so we do not need to worry about it being the “optimal”. As long as we land in the given radius, we can obtain a solution that is good enough and easier than trying to obtain the perfect center, which would most likely take a lot of time to do.