Report heuristics

Q6 and Q7 Admissible and consistent?

Question 6 corners problem heuristic

So for this problem I used the heuristic of the maximum distance I need to travel to eat some food. Why does this work, first it is admissible because that is the maximum distance I need to travel to achieve my goal. This can be done with manhattan distance or using the mazeDistance function that is already implemented, the manhattan distance will be less accurate while the mazeDistance will find the actual distance with BFS but this takes a longer computing time. It is also consistent because BFS will always find the shortest path in case all weights are considered one. If we use manhattan distance instead of mazeDistance, it would also be considered consistent because it always leads to one point. But because computing time is less relevant, we use the mazeDistance in our solution.

Question 7 Eating all the dots heuristic

Same heuristics will be applied here as Question 6. Why does it also work here because we look at the furthest food, so in case some food comes across the path while going to the furthest one, we can eat them while traversing to the furthest one. Consistency and admissibility still applies here for the same exact reasoning.

Is your heuristic for Q7 able to solve mediumSearch in a short time?

No, I mean considering short as less than 1 second. Mine takes around 7 seconds depending on pc for the trickySearch problem.

Discuss the use of suboptimal search for question 8. Give an example whereClosestDotSearchAgent goes horribly wrong.

We make use of UCS in our problem, because we just need to find the shortest path to a dot. We could use A* to improve computing time in case we had a good heuristics (like Manhattan).

Example: For instance we have a maze and a pacman with one dot on his right side and one dot on his left, the left dot is followed by more dots.

If the pacman takes the left dot first the next closest one is the following dot coming afterwards. But doing this traverse will eventually lead us to having to traverse all the way back to the beginning to get the last right dot we missed in the beginning. Instead of taking the left dot first it was a smarter move to take the right one first and then starting the left dot sequence of dots.