Written Q1: What are some differences between DFS and BFS in terms of path cost and number of expanded nodes? Which one would you pick when and why?

In BFS when the number of available path increases path cost also increase, on the other hand when the number of available path decrease expanded node of bfs increase. So while bfs finds optimal path more easily, dfs finds any path that leads to goal easily. I would choose bfs when I need optimality more than time spent solving and when there is less choice in path, otherwise dfs.

Written Q2: What are some differences between UCS and A\* in terms of path cost and number of expanded nodes? Which one would you pick when and why?

Number of nodes expanded changes with UCS and A\*. A\* expands less number of nodes and both of them optimal if heuristics used in A\* is consistent and admissible.

Written Q3: Comment on your choice of state in the four corners problem. Why does it allow you to solve the problem?

My choice was to create a state that keeps both position and four corner coordinates; [position [4 corners]]. It allows me to solve because when I call successor I check if the position is equal to one of the corners, if so I make state of that corner to (0,0). In isGoal I check if all the corners have become (0,0)

Written Q4: Comment on your choice of heuristic in the four corners problem. Why did you settle on that heuristic? Why is it admissible and consistent?

I chose to find manhattan distance of current position to each corner that is not explored yet, and took the minimum of this distances to be the heuristic for the position. This is admissible because I’m taking the minimum which means that it’s optimistic relative to alternative possible scenarios.

Written Q5: Comment on your choice of heuristic in the eating all the dots problem. Why did you settle on that heuristic? Why is it admissible and consistent?

My initial idea was to find the cost of path to closest food. This is admissible and consistent because relaxed problem assumes that there is only 1 food, which is very optimistic. But I found another idea, idea which thinks of all dots and nodes and calculates cost of MSP to add to cost of path to closest food from current location. But expanded nodes came about 300, so I decided to settle with my initial idea; I wasn’t sure if it was consistent. You can observe my other idea if you uncomment the commented part.

Written Q6: What are some practical differences between a consistent and an inadmissible heuristic, in terms of path cost and number of expanded nodes? Which one would you pick when and why?

Inadmissible heuristic is pessimistic, it can remove a path with higher cost from fringe. So inadmissible heuristic worse in terms of path cost. Inconsistent heuristic may lead to re-expansion of node many time. I would pick consistent, admissible heuristic to ensure optimality when the optimality is needed.