COMP 341 Homework #2 Report / Barış Aracı 62595

Answer Q1: For this one, I just checked two values which are the closest food and closest ghost. Also, I punished the "stop" action to make the Pacman always moves. If the manhattan distance to ghost is less than 3, then the Pacman just tries to move away from ghost. Otherwise, it tries to go to the closest food. I subtracted the food distance from 20(because food distance never exceeds 20 in the first maze) to make it always bigger than ghost distance. Therefore, Pacman directly moves to closest food after it moved away from ghost 3 manhattan distance units. At first, I returned the ghost distance as positive value and food distance negative value so that Pacman catches foods and avoids ghosts. But, when there was no food around (3 unit diameter), Pacman tried to be around ghost (because even the smallest positive value is higher than negative which I used for foods) instead of catching foods. That is why I returned both of them as positive value later.

Answer Q2: The second one (AlphaBetaAgent) is faster obviously since it prunes the values if searching further is unnecessary. For instance, if the first min agent is 5 and the first value of second one is less than 5 then it prunes the rest since the selected one will definitely less than 5 and max agent will not pick it anyway.

Answer Q3: Yes, they behave same because the selected cases were not changed. There is only extra pruning process for the second one which is about speed.

Answer Q4: I think it is almost same with Minimax (or close) because they both process all values. But, AlphaBeta prunes some values as I explained in Answer Q2, so it is faster.

Answer Q5: My approaches to two evaluation functions are way different from each other. I used evaluation value as a catching and escaping mechanism in the first question. In the fifth question, I used it as it is supposed to be. I used almost all of the usable values which are score, number of foods left, number of capsules left, distance to closest food, distance to closest capsule and distance to closest ghost (value changes if it is scared). Weights of them are explained in my next answer.

Answer Q6: I just tuned feature weights for second evaluation function. The only positive values are score and distance to closest ghost (since it is better as the Pacman goes farther from ghost). The rest are negative values because it is better for Pacman to decrease those values by collecting foods and capsules. I multiply the number of capsules with 50 because I wanted the Pacman to take the capsule instead of a food if the Pacman moves around it. Also, I multiply the number of foods with 5 to make the Pacman's main aim to diminish the number of foods. I did not multiply the rest and left them as they are. I tried different random values for them, but I achieved the highest average score with these numbers among my trials.