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Project 2 Analysis

1. What feature (or features) did you use for your (Reflex Agent) evaluation function?

For my evaluation function I used the inverse of the Manhattan distance to the nearest food, multiplied this by 0.99, then subtracted the inverse of Manhattan distance to the nearest ghost. Both Manhattan distances had 1 added to them to prevent dividing by 0. The 0.99 guaranteed that Pacman would always prioritize staying a safe distance from ghosts rather than risking going within 1 block.

2. When Pacman believes that his death is unavoidable, he will try to end the game as soon as possible because of the constant penalty for living. Give an explanation as to why the Pacman rushes to the closest ghost in this case?

Even when death is unavoidable Pacman will still try to maximize his score. Because Pacman constantly loses points just for living, the best way to do this is to die as quickly as possible, the longer he delays the lower his score.

3. You should find that your ExpectimaxAgent wins about half the time, while your AlphaBetaAgent always loses. Explain why the behavior here differs from the minimax case.

With minimax Pacman assumed ghosts would play optimally, and that if the game was going to end it should end as soon as possible. Now with expectimax Pacman will recognize he has a chance to escape death in the rather likely event the ghosts do not play optimally.

4. What features did you use for your new evaluation function?

I used a combination of the number of food items left, the number of capsules left, the Manhattan distance to the closest food item, and the overall score.

5. Self Analysis

1. What was the hardest part of the assignment for you?
The final evaluation function. Evaluating an action instead of a state felt much more natural in the context of trying to eat food.
2. What was the easiest part of the assignment for you?
Either minimax or my first evaluation function, both were right practically on my first try.
3. What problem(s) helped further your understanding of the course material?
Probably implementing alpha beta pruning, it forced me to think about it enough to understand it.
4. Did you feel any problems were tedious and not helpful to your understanding of the material?
The last one felt a bit out of scope, but it was still good practice.
5. What other feedback do you have about this homework?
No complaints, another engaging project.