Artificial Intelligence CSE537

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Question 1 – Reflex Agent

The basic idea is that if there is no ghost nearby we would aggressively search for the nearest food. Also, if there is no ghost around, we evaluate a low score to the current state so that the PacMan doesn’t stop. Also, if there a food in the next step and no ghost nearby we give this state a higher preference. We are using the nearest ghost distance, nearest food distance and foodCount along with the above methodology to calculate our heuristic.

Question 2

MinimaxAgent:

The function getAction in MinimaxAgent calls the getminimaxAction which takes the current gamestate, turn(as in who is playing), depth(initially zero) to find the best action using minimax algorithm.

Turn = 0 -- Pacman, Turn > 0 – Ghost in the order

This function generates the successor state for an agent and finds the minimum value (for ghost) and maximum value(for packman) among the successor states. Once the maximum depth is reached returns the evaluation function for that state.

Question 3

AlphaBetaAgent:

The function getAction in AlphaBetaAgent calls the getalphaBetaAction which takes the current gamestate, turn(as in who is playing), depth(initially zero), alpha(initially INT\_MIN), beta(initially INT\_MAX) to find the best action using minimax algorithm.

Turn = 0 -- Pacman, Turn > 0 – Ghost in the order

This function generates the successor state for an agent and finds the minimum value (for ghost) and maximum value(for packman) among the successor states and stops exploring further successor states once alpha > beta. Once the maximum depth is reached returns the evaluation function for that state.

Question 4

ExpectimaxAgent:

The function getAction in ExpectimaxAgent calls the getExpectimaxAction which takes the current gamestate, turn(as in who is playing), depth(initially zero) to find the best action using minimax algorithm.

Turn = 0 -- Pacman, Turn > 0 – Ghost in the order

This function generates the successor state for an agent and finds the average of all scores for chance nodes(for ghost) and maximum value(for packman) among the successor states. Once the maximum depth is reached returns the evaluation function for that state.