

Assignment 3: Multi-Agent Pacman

Question 4

1. In the case of AlphaBetaAgent, the pacman assumes that the ghosts will always rationally choose the best actions to hunt, so it thinks that there is no need or chance to escape. In the case of ExpectimaxAgent, the pacman only knows the expected, possible moves of the ghosts, so it will at least try to escape and grab more foods.
2.
 - a. True. V_E is chosen based on the expected values, which are the original values of the nodes times the corresponding probabilities, then a small value with a high probability might be chosen. V_M , on the other hand, is the maximum original value without considering the probability.
 - b. True. The optimal minmax policy allows the root node to choose the maximum value V_M among all values of the child-min-nodes, and V_M must be the optimal value for the root node. Also, based on a. we know that $V_M \leq V_E$.
 - c. False. Based on a. and b., we know that V_E is always greater or equal to V_M , and the payoff should be at least V_M .