Assignment 3: Written Answers Part 2

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Question 4.

1. Assuming that ghosts picks their best move, AlphaBetaAgent picks the optimal move that gives maximum score in its search domain. It may pick a move that kills itself if rest of the search domain gives less score. This is error prone because the Pacman could have continued going and end up with a higher score.

   Assuming that ghosts picks random move based on probability, ExpectimaxAgent may give choices that lets Pacman to grab more food before it gets trapped and game ends.

2. (a) True. Every node in the Expectimax game tree will have equal or greater value than the corresponding node in the Minimax game tree. Since the root node takes the max value among the succeeding chance (expectimax) or min (minimax) nodes, then we can be sure that $V_e > V_m$.
   (b) True. (a) tells us that $V_m < V_e$ always (also for sub-max nodes). The max node will always select from the chance nodes the value equal or greater than the min values it would have gotten from the min nodes. Therefore, we can conclude that the payoff will always be at least V_m.
   (c) False. Since (b) is true and (a) says that $V_e > V_m$, the payoff cannot be "at least" V_e because there is a smaller possible value.