AI Project 1 – Siegfried Lein, Max Hallemeesch

Using first version of the assignment

Question 1: It avoids getting close to ghosts and gets rewarded if it eats food in the next move. It is limited because it doesn't look further in the future and just cowardly stays away from ghosts.

Question 2: A simple modification would be that the agent also gets rewarded if it gets closer to food pellets.

Question 3: The agent get punished for doing nothing. Waiting to die also results in a lower score then dying fast because there are more turns, more turns of losing points.

Question 4: The agent looks a *depth* amount of moves in the future and takes the move that gives the best score with the assumption that the ghost do their best move.

Question 5: The reflex agent takes the best move with the current game state according to the evaluationFunction. The minimax agent always takes the ghosts moves in account and then uses evaluationFunction. The minimax agent also thinks some moves ahead.

Question 6: The minimax agent doesn't really care if it picks up food, it also loses to getting trapped by the ghosts. The trapping could be improved with greater depth, but this could also result in the agent being even more scared of the ghosts. The agent would probably also perform better if it actively ate food (gets more reward from eating food) and not stand still as much.

Question 7: Alpha-beta pruning doesn't calculate parts of the tree that would result in path it will surely not take. The minimax does calculate these parts but, as said before, will not take them. In this way the both get the same result.

Question 8: In prior implementations our pacman agent always assumed that the ghosts would play optimally. Thus, pacman always reacts by looking at the ghosts' best moves and therefore reacts on the worst case scenario (since the optimal move for the ghosts is has the worst effect for pacman). However, these ghosts don't actually always execute the optimal move (in their perspective). The Expectiminimax algorithm allows pacman to not only focus on the optimal move of the ghosts. Therefore pacman can sometimes execute more "risky" moves that earns him more points or puts him in a more advantageous position/gamestate.