## Artificial Intelligence Course

## Project 2

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### Comments about the assignment (if you have)

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### Question 1:

### The evaluation function takes in a gamestate and an action. It then computes numerical values for how good or bad a certain action is in this current situation. These favorable or unfavorable conditions include for example the amount of food, amount of ghosts and if the ghosts are scared or not. The score is also evaluated for the capsules and current score. Some other metrics could also be applied but this was sufficient for the performance we were looking for.

### Question 2:

### Our implementation of minimax is really simple. First it determines whose turn it is, pacman or ghost and then calls min\_value or max\_value for the desired state accordingly. Min\_value and max\_value call minimax again recursively, to get the minimum action value for ghost movement and maximum movement value for pacman movement.

### Question 3:

Used the pseudo-code structure from the assignment pdf, with a function which handles using the minvalue and maxvalue functions in appropriate cases. Moves are evaluated, and then updated to a variable in the loop only if current evaluated move results in a better score than previous moves. Scores start from infinity and negative infinity, so first evaluated scores are always better than default values. Alpha-beta -pruning essentially speeds up the process by not exploring less-promising trees any further than necessary.

### Question 4: Expectimax

### Basically just modified code from q2, changing min\_val() to exp\_val(). For the ghosts, we multiply the exp\_val() return value with the probability of a random ghost’s moves 1 / number of legal moves. Max\_val() for pacman works the same as in minimax.

### Question 5:

### This better evaluation function does not consider actions of either pacman or the ghosts. Instead, it only takes the gamestate as its argument