**Artificial Intelligence HW-2**

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References taken from:

* Artificial Intelligence: A Modern Approach by Stuart and Peter
* https://stackoverflow.com/questions/23742098/how-should-i-do-with-evaluation-function-in-minimax
* http://oleksiirenov.blogspot.com/2015/03/designing-agents-algorithms-for-pacman.html

**Q1:**

For the evaluation function, I used Manhattan distance heuristic to calculate the distance between current pac man position and the position of each food in the food list.  
The score is calculated as the maximum of the negative Manhattan distance, which would always be the closest food position from the current position of pac man. This will be continued till pac man is not directed to STOP.

**Q2:**

For improving the Evaluation function, I used the Manhattan-distance heuristic.

For every ghost, we calculate the ghost distance from the current position of pac man and calculate the score. Then for every food present, we go on to calculate the distance of the food from the current pac man position.

To calculate the score, we use the ‘distance to cover’ as our heuristic. We start by initializing the distance to the minimum food position (closest food position from pac man). If there are more than one food present, we add the maximum food position into our heuristic.

For calculating the score, we took the inverse of this distance and multiplied by 15.5. This means that score is inversely proportional to the distance covered, i.e. more the distance pac man has to cover for food, lesser would be the score. If there is no food in food list, score is updated by 200.

Also for every ghost, if it’s ghost distance (distance from ghost to pac man) is less than or equal to 2, score would be the least integer value, otherwise, take inverse of this distance, multiply it by 10 and subtract from score. This means score is proportional to the ghost distance, i.e., larger the ghost distance, greater the score is.