

Problem 4

- HOG feature
HOG feature is a well-known feature on classification problems (usually used by SVM).
- The number of separate, connected regions of white pixels
 - 1 2 3 5 7
 - 0 4 6 9
 - 8
- The number of two adjacent pixels that are not the same color in some vertical or horizontal lines
 - vertical
 - * 1
 - * 2 3 5 6 8 9
 - * 0 4 7
 - horizontal
 - * 1 2 3 5 7
 - * 0 4 6 8 9
- The ratio of black pixels in some vertical or horizontal lines
Since these three features are apparently different on some different digits (see the above approximate lists), they should be useful on classification problems.

Problem 6

- Distance to each food
- Distance to each capsule
- Distance to each scared ghost
- Distance to each ghost

The first three terms are apparently good for pacman either to win or to get higher score, and the last term is important to pacman since pacman should not be too close to any ghost.