

Report 5: Pacman Ghostbusters

Question 6

Write down the equation of the inference problem you are trying to solve

The equation we are trying to solve in the function `observeUpdate()` is:

$$P(X | Z) = \frac{P(Z | X) \cdot P(X)}{P(Z)}$$

Question 7

Write down the equation of the inference problem you are trying to solve

The equation we are trying to solve in the function `elapseTime()` is:

$$P(X | Y, Z) = \sum P(X | Y) \cdot P(Y | Z)$$

Where:

- $X = newPos$
- $Y = oldPos$
- $Z = gameState$
- $P(X | Y, Z)$ is the updated belief about the ghost being at position `newPos` given the old position `oldPos` and the current game state `gameState`. This is what we are trying to compute.
- $P(X | Y)$ Is the probability of the ghost moving to position `newPos` given that it was at position `oldPos`. This is obtained from the **getPositionDistribution** method
- $P(Y | Z)$ is the current belief about the ghost being at position `oldPos` given the current game state **gameState**. This is stored in `self.beliefs[oldPos]`

Question 8

Can you think of a better strategy than the greedy strategy?

Describe how Pacman can use the probability values to their advantage and more effectively hunt ghosts

Mark the average score of the greedy strategy and of your alternative in your report.

Question 14

In both tests, pacman knows that the ghost will move to the sides of the gameboard. What is different between the tests, and why?