Artificial Intelligence

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Assignment 0

Question 1. Exact Inference Observation: Write down the equation of the inference problem you are trying to solve.

new_belief[p] = $getObservationProb(observation, gameState.getPacmanPosition(), p, self.getJailPositio$
$old\_belief[p]$
getObservationProb(observation, pacmanPosition, position, jailPosition) =
P(noisydistance |pacman position, ghost position)

Question 2. Exact Inference with Time Elapse: Write down the equation of the inference problem you are trying to solve.

new_belief[p1] = $\sum_{\substack{p \in allPositions \\ old\_belief[p] \neq 0}} old\_belief[p] \cdot getPositionDistribution(gameState, p)[p1]$
getPositionDistribution(gameState, ghostPosition) = P(ghost position at time t+1 |ghost position at time t)

Question 3. Alternative answer for GreedyBusterAgent

Correct answer for GreedyBusterAgent:
Average score: 754.7
Alternative answer for GreedyBusterAgent:
Average score: 758.7
Alternative answer 2 for GreedyBusterAgent:
Average score: 754.3
The first alternative answer is better than the correct answer and there is also a variable k that could be played with to change the score.
The first alternative answer is still a bit greedy but added with some randomness so most.
The second alternative answer is a bit less greedy, the strategy is considered less greedy because it doesn't always choose the action that brings Pacman closest to the nearest ghost. Instead, it uses a probability distribution to decide which ghost to chase. This means that while the closest ghost has the highest probability of being chosen, there's still a chance that a farther ghost might be selected. This introduces an element of randomness and exploration into the decision-making process, which can potentially lead to better overall strategies.