Rob Schwartz
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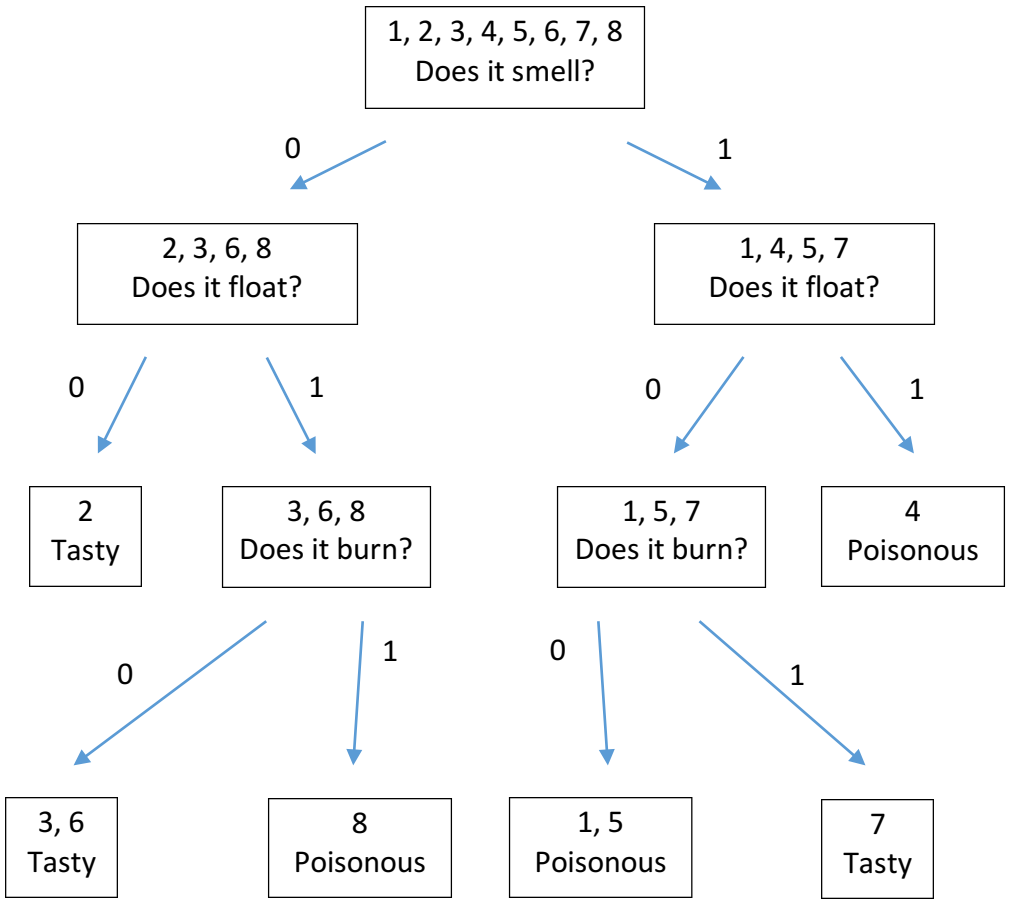
WHW3

Question 1: Alien Fruit



Question 2: Capture the Flag Design

a. Jeremy Margolis was my partner.
b. Heterogeneous.

c. We designed one offensive agent and one defensive agent. Although we hoped to implement some sort of particle filtration that we could include to help each agent (offense and defense) locate the opposition, we were unable to get it working and thus left it out of our final submission. Both agents are very much reflex agents, so they have various features and weights for those features, which we multiply together in our evaluate function. We successfully created a minimax function, hoping that our offensive agent could use it when being chased to avoid the various crevices and paths that would lead him to a dead end. However, because minimax timed out after 3 moves for each agent, it ended up not being very useful. I believe we decided at the last minute to not include it in our final submission. Otherwise, we considered

what we thought would be valuable to the overall strategy we hoped to implement and included those features in our reflex agents.

d. I'll include two values: one for how our project was submitted and one for how it would have been had we done everything we wanted.

Submitted: 0% Project 1, 85% Project 2, 15% Project 3, 0% Project 4
Hoped: 0% Project 1, 50% Project 2, 15% Project 3, 35% Project 4

e. The agents we submitted used nothing from Project 1, the Reflex Agent structure, minimax, and pruning from Project 2, the feature/weight structure from Project 3, and nothing from Project 4. We had hoped to include some sort of particle filtration but failed to properly implement it.

Question 3: CTF v2.0

a. I've been reading about Google's incredibly sophisticated reinforcement-learning-based Chess AI called AlphaZero - it beat the world-recognized best chess program (until now), Stockfish, 27 times out of 100 and lost 0 times. And get this: Google only taught it the rules of chess (i.e. how the pieces move, how one player wins/loses). Then, AlphaZero played against itself for a mere 4 hours before defeating Stockfish. I'd love to do more research in this area and would probably devise pacman agents in the spirit of AlphaZero. I'd supply it with all the necessary tools to read the game (a correctly implemented particle filtration system, size of the maze, number of agents, etc.) and let it run using sophisticated Reinforcement Learning software against itself. The idea behind this decision is this: I designed my agents a way that reflects how I would play the game. However, I really don't know what the best way to play is. If we developed an AI using reinforcement learning, it could actually determine the optimal strategies.