Jonathan Levy
COP3502
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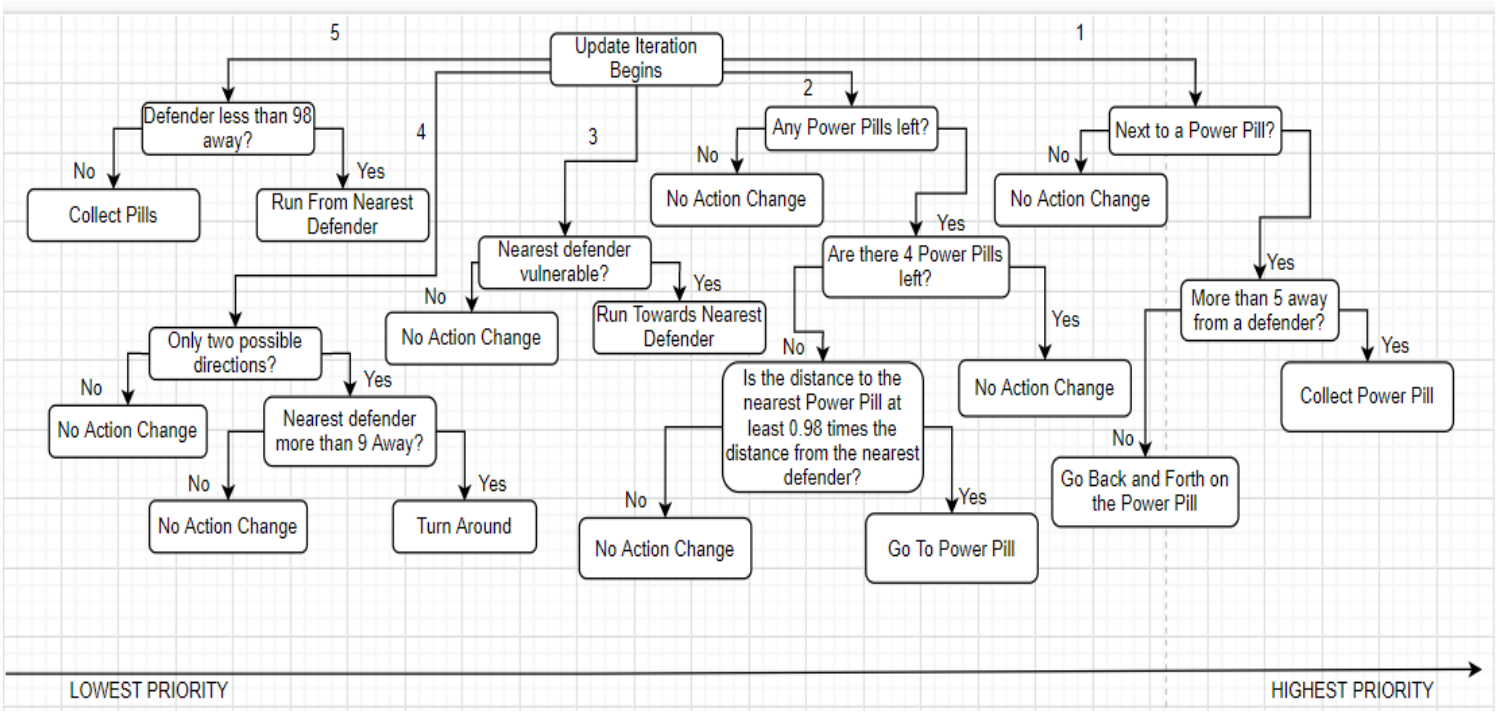

Description of Attacker Behavior and Methods

While the diagram above looks quite complex, it is quite simple. There are 5 primary "If" statements which run in order from arrow 5 to arrow 1. Each of these if statements will lead to either a change in action, or no action change. Branches with higher priority take precedence in their outputs.

"If priority" 5 is a basic if statement that determines if the attackers focus should be collecting pills or running from the nearest defender based on an optimal distance that was determined through trial and error. This sets up the default action for the attacker.

"If priority" 4 ensures that an attacker will not run into a defender when in a narrow hallway. Also generally ensures that the attacker runs the opposite direction of the defenders. If the defender is too close however, the attacker will take no action change.

"If priority" 3 causes the attacker to run towards the nearest defender when vulnerable and no action change if not.

"If priority" 2 first checks if there are any power pills left (to prevent an out of bounds exception error). It then checks if there are four left. If there are four left, the attacker takes no action change. If there are less than 4, the attacker checks if the distance times 0.98 is at least the distance to the nearest power pill. If it is, the attacker goes to the power pill. If not, the attacker takes no action change.

"If priority" 1 checks if the attacker is next to a power pill. If not, take no change in action. If it is, It then checks if the nearest defender is at least 5 away. If so, move back and forth on the power pill. Otherwise collect the power pill.

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What Went Right and What Went Wrong

Many things went right when coding this project. One thing that went right was the speed at which I was able to reach the required point cap. Overall I would say it took about 5-6 hours to complete, with at least half of those hours trying to figure out how the given code and methods operated.

Another thing that went right was the development of an improved power pill strategy which I believe singlehandedly accounted for at least 7000 points out of my total average.

Lastly, my ability to nearly double the required points (12000) felt like a massive accomplishment considering the difficulty of this project in terms of conceptualization.

The main issue that arose when attempting to make the attacker focus on collecting pills rather than running from defenders. Intuitively, I imagined that the attacker should only run from defenders when they are close by and focus on pills otherwise. However, it seemed that as I lowered the distance they started to run at, the average scores would become lower. This led to a different problem which was that the attacker would (and still does) get stuck in the top two loops indefinitely if there are no power pills on the map. This issue perplexed me so much that I decided to focus on improvements elsewhere in the code.

Another issue was the number of ideas I had that I was unable to implement due to an inability to translate said ideas into code. One idea I had that I was unable to implement was an even more improved pill strategy. I wanted to have it so that when the defenders were all an average distance away, the attacker would then seek the power pill. However, I ran into multiple problems trying to code this and went with a simpler but less effective idea.

Reflection

This project was a lot of fun to work on and reminded me why I am taking this class in the first place. While not a CS major, I love the idea of programming and plan to minor in CS. This project also taught me a great deal about the value of planning when it comes to coding. Initially this project felt like a lot to take in. I became worried when I looked at the number of methods and how many files were involved. However, sitting down and reading through the methods multiple times allowed me to gain a good understanding of the code and to use the methods easily within my code. Overall, this project was a valuable experience and was a great last project for this class.