101-3
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Application Name: Maze Runner

Application Description:

The objective of this Software Development project is oriented around problem solving through the implementation of Artificial Intelligence. We will be utilizing a maze as the test environment and allowing the user to race the A.I. This software will be formatted on a website. If project has come to meet our standards of functionality, we will implement an "A*" algorithm that would allow the user to check the most efficient route.

The A.I. that we will be designing as a group will be a generational system that would allow for the computer to progressively achieve the goal. Each generation will evolve from the most successful child of the previous generation. There will be a difficulty setting that would increase the complexity of the maze for both the user and A.I. There will be a secondary difficulty feature that would allow the user to choose which generation of A.I. nodes to race against. The website that we will be designing will have a login page that will have the option of creating a new user or using a username and password to gain access. This data will be recorded into a database along with highscores/ leaderboard.

The value of this software demonstrates the complexity and advanced learning nature A.I. can provide, even with the simplest tasks. By viewing the different generations of Artificial Intelligence, we are able to see which generation is more efficient compared to the user themselves.

Vision Statement:

For people who want to interact and to discover with AI, the Maze Runner is a web-based game that allows an individual to compete against different generations of AI. Unlike any other typical mazes, our product incorporates AI and different algorithms to compete against an abundance of users.

Development Method:

We would like to tackle this project with a hybrid of agile and waterfall methodology. We want to hit milestones as a group but divide the work into sub-groups. Initially, we will address the website in one group and design the format of the maze and functionality in the other. Once we have completed these two tasks, we will start combining the two and addressing the A.I. software implementation.

Communication Plan:

Our team during the course of the project will meet at least once a week with all members for two hours on Tuesdays from 2-4, more if time allows. We have set up a GroupMe which allows us to communicate with each other nearly instantaneously as it is an app on our phones. As problems may arise during the project, we will communicate to each other what we expect from each other and how we can help one another if we're struggling on a specific task. We will also communicate if we feel that if a team member(s) is not pulling his or her weight, or if someone is pulling too much weight. We plan to divide up the tasks between each of us, so that no one should be pulling too much weight in the first place.

Proposed Architecture Plan:
- **Back end:** We will need to store the users username and password and their scores as well as overall scores for the scoreboard. We decided to use Python to generate the AI.
- **Front end:** What users should see when they first get to the website is a login screen where they have a username and a password to identify themselves. Once granted access they will be brought to a page where they can race against an AI, and depending on which difficulty they choose, they will race against the different generations of AI. Once finished, they can see their scores on a scoreboard. We will use HTML, CSS and JavaScript to develop the front end.

Meeting Plan:

Our team will be meeting in person between 2:00 and 4:00 PM every Tuesday in Norlin Library. Extra slots are set aside from 3:00-4:00 on Wednesday and 1:00-200 on Friday to use if necessary to finish parts of the project outside of the normal meeting times. Given that milestones are now due on Mondays, we might also meet on the weekend, right before we turn milestones in, to go over what needs to be done.