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*Maze Solver that finds optimal path*

*### 1. \*\*Project Background\*\**

*- Briefly explain the general area the project falls under (e.g., network security,*

*data analysis, gaming, etc.).*

*- Provide context on why this area is relevant or important today.*

*This project may be applicable to simulations or path-finding if expanded. As is, the concept*

*involves determining the optimal path through a maze, comparing two data structure frameworks*

*and their efficiency. Shortest path calculations are important for delivery route planning or*

*can be abstracted and applied to process optimization (translating maze sections into process duration)*

*### 2. \*\*Motivation\*\**

*- Describe the motivation behind selecting this project.*

*- Connect the project to real-world applications or benefits.*

*I chose this project for a simpler premise than my first exam's concept,*

*but still maintaining an interesting topic to me. Process optimization, and optimization*

*more generally, are something that interests me. This is especially true for side-projects and hobbies.*

*Certain robotics competitions are centered around mazes which also strongly draws my interest.*

*### 3. \*\*Problem Statement\*\**

*- Define the specific problem the project aims to solve.*

*- This section may take several different forms including (but not limited to):*

*- Example: Current Intrusion Detection Systems (IDS) suffer from inefficiencies in detecting complex,*

*subtle attack patterns due to limited data processing capabilities.  The objective of this*

*project is to design and implement a more efficient Intrusion Detection System that can effectively*

*detect and prevent unauthorized access using advanced data structures for real-time monitoring.*

*Some types of robotics competitions focus on getting a robot to solve a maze then drive through it*

*as fast as possible. This project aims to design and implement a simplified version of this,*

*that finds the optimal path through a random maze and compares results using two different data*

*structure frameworks.*

*### 4. \*\*Objectives\*\**

*- List the main objectives of the project.*

*- Outline what the project aims to accomplish, such as specific features or functionality.*

*- This section will largely elaborate on the previous problem statement section above.*

*1. Use an algorithm to find a path through the maze*

*2. Determine optimal path*

*3. repeat to compare two data structure frameworks (stack v array)*

*### 5. \*\*Key Data Structures\*\**

*- Mention the data structures that will be central to the project.*

*- Briefly describe why these data structures are suitable for solving the problem.*

*Finding a path through the maze can be done with a queue and array, where the queue*

*stores the path taken, and the array holds the maze. This could be compared against*

*a different system, using a stack for the pathing and a queue to hold the maze.*

*### 6. \*\*Scope and Limitations\*\**

*- Define the scope of the project: what it will include and focus on.*

*- Outline any limitations, such as what the project will not cover or simplified assumptions made for feasibility.*

*Evaluating whether a path is optimal will require further research. If it turms*

*out to be too complicated for me to still focus on data structures, it could shift the scope.*

*Another assumption is that the comparison between frameworks will use the same maze. Finally,*

*this could involve a function two build a maze randomly.*

*### 7. \*\*Expected Outcomes\*\**

*- Describe the desired end result or product of the project.*

*- Highlight how success will be measured (e.g., efficiency, accuracy, usability).*

*The outcome of this project is to compare the efficiency of two different maze solve frameworks,*

*being a stack and queue or queue and array. This will be evaluated by tracking the time spent*

*solving the maze(s).*

*### 8. \*\*System Block Diagram\*\**

*- The system block diagram should be included as an image in the draft report.*

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