MAZE ADVENTURE –Maze Solver Game

● Project Maze Adventure –Maze Solver Game

● Overview of the Project

Maze Adventure is a Python-created terminal-based maze exploration game. Players navigate the maze employing keyboard inputs. Aim to arrive at the exit indicated by 'E'.

The project further features an AI-driven solver that determines and shows the route from the player's current location to the exit by employing the Breadth-First Search (BFS) algorithm. This showcases an application of pathfinding methods and analytical problem-solving, within a grid-style environment.

● Features

- **Controlling player movement, with W, A S D keys**
- **Exit based goal system**
- **AI-powered solve option to display shortest path**
- **Breadth-First Search (BFS) algorithm for pathfinding**

- **Wall collision prevention**
- **Boundary checking for safe movement**
- **Replay option after completing the maze**
- **Terminal-based interactive interface**
- **Error handling for invalid inputs**

● Technologies / Tools Used

- **Python 3**
- **Breadth-First Search (BFS) Algorithm**
- **collections.deque for queue implementation**
- **OS module for screen refresh**
- **VS Code / Terminal for development and execution**
- **Git & GitHub for version control**

● Steps to Install & Run the Project

1. Clone the repository:

git clone <your-github-repository-link>

2. Navigate to the project directory:

cd Maze-Adventure

3. Run the game:

python maze_adventure.py

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● Instructions for Testing

Manual Testing Process:

1. Start the game and verify the maze loads correctly.

2. Control the player, by using:

o W (Up)

o A (Left)

- **S (Down)**
- **D (Right)**

3. **Attempt to move into walls to confirm collision prevention.**
4. **Type solve to display the AI shortest path.**
5. **Try reaching the exit to verify victory condition.**
6. **Select replay option to test restart functionality.**
7. **Type q to confirm quit functionality.**

Expected Results:

- **Player is unable to move through walls.**
- **Game remains stable when given input.**
- **The AI accurately shows the route.**
- **Finishing the exit initiates a success notification.**
- **System operates smoothly without errors.**