**Maze Solver Project**

**Overview**

This project implements an AI algorithm to find the shortest path through a virtual maze. The maze is represented as a grid of cells, with obstacles and free spaces. The goal is to find the shortest path from the starting point to the goal.

**Project Structure**

* **main.py:** The main Python script containing the maze generation, user interface, and A\* search algorithm.
* **requirements.txt:** File specifying the Python dependencies required to run the project.
* **run\_project.py:** Script to run the project and check/install dependencies.

**Getting Started**

**Prerequisites**

* Python 3.x installed (<https://www.python.org/downloads/>)
* Pip (Python package installer) installed.

**Installation**

1. Clone or download the project to your local machine.
2. Open a terminal and navigate to the project directory.

|  |
| --- |
| cd path/to/project |

1. Create a virtual environment (recommended).

|  |
| --- |
| python -m venv venv |

Activate the virtual environment.

**For Windows:**

|  |
| --- |
| .\venv\Scripts\activate |

**For Linux/Mac:**

|  |
| --- |
| source venv/bin/activate |

1. Install project dependencies.

|  |
| --- |
| pip install -r requirements.txt |

1. If A new release of pip is available: For example (23.2.1 🡪 23.3.2)

|  |
| --- |
| python.exe -m pip install --upgrade pip |

**Running the Project**

1. Ensure the virtual environment is activated.
2. Run the project.

|  |
| --- |
| python main.py |

1. Follow on-screen instructions to mark the start and goal states on the maze.

**Creating Executable**

1. To create a standalone executable file:
2. Install PyInstaller.

|  |
| --- |
| pip install pyinstaller |

1. Navigate to the project directory.

|  |
| --- |
| cd path/to/project |

1. Run PyInstaller.

|  |
| --- |
| pyinstaller --onefile main.py |

Building EXE from EXE-00.toc completed successfully.

The executable will be in the ‘dist’ directory.

**Additional Information**

* The maze is dynamically generated based on your enrolment number.
* The AI algorithm uses the A\* search algorithm to find the shortest path.