

Lost in Space-Time

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1 Introduction

The maze(Lost in Space-Time) is made using the module pygame. Pygame offers a variety of assets and modules that aid in game development. The theme of my game is, a portal has appeared near the character at his home world and it pulled it into a different dimension, where space-time is unstable, the player should navigate the 3D maze and should be aware of the unnatural things occurring in the new dimension and navigate his way to a wormhole that takes him to his home world, but if space-time becomes highly unstable or the player doesn't have any energy to fight the instability, the player will be transported to the end of space-time, from where there is no return.

2 Modules

2.1 Pygame

Pygame is the main module used by me in the game development, because it's open-source, easy to use and provides a wide range of submodules that aid in game development. Pygame is used in my game for handling graphics and user inputs.

2.2 Random,Math

Random and Math modules are used in random maze generation in maze.py

2.3 Numpy

Numpy module is used to store the maze array and path array and I have used numpy to simplify array manipulations,
For example, to update player tile

2.4 Sys

Sys module is used to handle exits cleanly.

3 Directory Structure

3.1 Python files

There are 4 python files in my main directory:

game.py This file handles the main game(app) control by switching between start,game and end windows.

windows.py This file contains the graphics code of different windows and handles user inputs in different windows.

maze.py This file contains the algorithm for the random maze generation and the function is called in windows.py and the generated solution path is stored in path.txt .

player_file.py This file contains the player class and it's attributes for game-play and graphics.

3.2 .txt files

path.txt The solution path of the randomly generated maze is stored in path.txt. the letters U,L,D,R represent up,left,down and right respectively and the letters C and F represent climb(on clicking left SHIFT) and fall(on clicking left CTRL).

highscores1.txt This file stores the top 5 scores of level 1 (labyrinth).

highscores2.txt This file stores the top 5 scores of level 2 (wormhole).

highscores3.txt This file stores the top 5 scores of level 3 (singularity).

3.3 images and sprites

start.jpeg The background image for start window.This image is generated by Adobe Firefly



Figure 1: Background of start window

end_won.jpeg The background image for end window if won.This image is generated by Adobe Firefly



Figure 2: Background of end window if won

end_lost.jpeg The background image for end window if lost.This image is generated by DeepAI



Figure 3: Background of end window if lost

loading.jpeg The background image for loading.This image is generated by DeepAI



Figure 4: Loading window

sprites for tiles The tile, the dark blue spiral and the light blue spiral are taken respectively from freepik, creativefabrica and pinterest and the images are edited and frames are generated using Adobe Photoshop and are saved as tile.jpg, saved in blue folder, to produce the swirling animation.

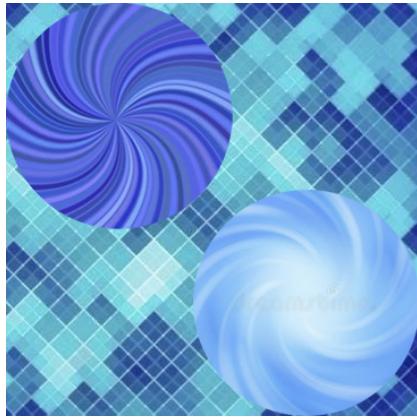


Figure 5: dual swirl tile

player sprites player sprites is modeled from here

portals,wormhole,potion and checkpoint The portal animation sprites is taken from elthen and other images are taken from the internet.

space background The space background has been extracted from giphy and the frames has been extracted and run as background

4 Working and Features

4.1 Maze generation

The maze is generated based on an algorithm designed by me. The path is generated first from start to end point and then the dead-ends are created after based on probability, after each tile is generated in path , the probability to move towards the end increases.

My game has 3 levels

Labyrinth labyrinth is a 2D 27*27 maze.

Wormhole wormhole is a 3D 11*11*3 maze, that is it has 3 floors

Singularity singularity is a 3D 9*9*5 maze, that is it has 5 floors

4.1.1 Gameplay and Features added

The main resources used by me are ChatGPT and pygame documentation. The game follows a 7*7 vision grid centred around the player(follows the player).

The player must reach the Wormhole to get back home before the timer for temporal breakdown runs out and the player must conserve his chronomorphic energy, or else he gets thrown into the end of space-time, where there is no return.

Sometimes at random moments time slippage(inspired from L.O.K.I) happens, where the player gets teleported back to his past. But the player can setup a checkpoint by using his energy and he can teleport back to the checkpoint from anywhere else and there are time potions scattered around the maze that when consumed increases the chronomorphic energy.

Hence the player can strategically use these phenomenon and powers to navigate the new dimension and get back home.

An image of the gameplay window of labyrinth is uploaded below



Figure 6: gameplay

Instructions of the game are uploaded in the following images are provided in detail



Figure 7: instruction1



Figure 8: instruction2

5 Conclusion and Journey

I have started my project from my maze-generation part, this has taken a lot of time since I have used an algorithm developed by me and this has taken a lot of time debugging and improving the algorithm, then I have developed the game-play UI and made small changes progressing slowly and finally I have added the leaderboard, sprite animations and collectibles and other features.

This journey creating the game has been exhausting to be honest but very enjoyable and I have learnt that patience and perseverance is really important.

The following git log explains my journey developing the project in detail

```
commit f744999744747c7151770302053929d6a01b0
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sun Apr 26 18:08:11 2024 +0800

    game done, need to add music and the manual and leaderboard

commit b07c94dd5eefc6bd97226168958d96dace1eb067
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sun Apr 26 18:08:11 2024 +0800

    time slipping animation added, need to add the time portion and check point and highscores and manual

commit d209a83a5a1e02921081a864771173541546732c2
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sun Apr 26 18:08:11 2024 +0800

    basic script for movements added, game window updated and timer and energy are needed to be improved

commit 77033a500edf979b51a37a5317a945e5ca169742
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sat Apr 27 01:28:11 2024 +0800

    basically done

commit f77033a500edf979b51a37a5317a945e5ca169742
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sat Apr 27 01:28:11 2024 +0800

    basic script for movements added, game window updated and timer and energy are needed to be improved

commit 77033a500edf979b51a37a5317a945e5ca169742
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sat Apr 27 01:28:11 2024 +0800

    basic ui done need to add camera effect

commit f77033a500edf979b51a37a5317a945e5ca169742
Author: alain20op <ccbuanreddy@gmail.com>
Date: Sat Apr 27 01:28:11 2024 +0800

    a bit of ui improved with teleportation added but need to make a lot of graphical improvements

commit f4e0c103bb083097fa3eac54ed797479738724009e
Author: alain20op <ccbuanreddy@gmail.com>
Date: Fri Apr 26 08:06:33 2024 +0800

    start end and end windows added , but need to improve the ui of game window

commit f4e0c103bb083097fa3eac54ed797479738724009e
Author: alain20op <ccbuanreddy@gmail.com>
Date: Fri Apr 26 08:06:33 2024 +0800

    3d game completed, need to add ui and collectibles

commit f37049eab747c215fa05421e9981d6f81556021
Author: alain20op <ccbuanreddy@gmail.com>
Date: Thu Apr 26 08:57:13 2024 +0800

    basic 3d game completed with variable floors, ui and collectibles left

commit f8fc03b70994467ff783e303545a227742d088fdcc
Author: alain20op <ccbuanreddy@gmail.com>
```

Figure 9: gitlog1

```
loops found and probabilities not working as intended
commit f344999744747c7151770302053929d6a01b0
Author: alain20op <ccbuanreddy@gmail.com>
Date: Thu Apr 18 02:14:49 2024 +0800

    basic 3d game complete, need to improve gui and collectibles

commit 89db3bcf1f1ea8f0eff58a012682278d8d6dc
Author: alain20op <ccbuanreddy@gmail.com>
Date: Thu Apr 18 02:14:49 2024 +0800

    made the game 3d more necessary to understand it

commit 89db3bcf1f1ea8f0eff58a012682278d8d6dc
Author: alain20op <ccbuanreddy@gmail.com>
Date: Wed Apr 17 14:18:04 2024 +0800

    basic 2d game completed and add all the files

commit 89f6c24b038479704428d8dace1b1873fd07281
Author: alain20op <ccbuanreddy@gmail.com>
Date: Wed Apr 17 14:18:04 2024 +0800

    basic 2d game with movements done but orientation stuff left

commit 5923ea9a521167a855d0d17784e090a2dccb2 [misplaced_start]
Author: alain20op <ccbuanreddy@gmail.com>
Date: Tue Apr 16 18:59:36 2024 +0800

    fixed the errors

commit 950b0556a2b0875e9a444ff7c4ca3579d9b3689
Author: alain20op <ccbuanreddy@gmail.com>
Date: Tue Apr 16 18:59:36 2024 +0800

    misplaced start if no possible moves

commit bbe0fcd8b3d6da7a7988b11cbcb330d8c7792b
Author: alain20op <ccbuanreddy@gmail.com>
Date: Tue Apr 16 18:59:36 2024 +0800

    loops solved but doesn't work always and 2d

commit 7a7729b5442529423979c979c979d47c22764
Author: alain20op <ccbuanreddy@gmail.com>
Author: alain20op <ccbuanreddy@gmail.com>
Date: Thu Apr 11 15:22:42 2024 +0800

    the one with loops

commit 7a7729b5442529423979c979c979d47c22764
Author: alain20op <ccbuanreddy@gmail.com>
Author: alain20op <ccbuanreddy@gmail.com>
Date: Thu Apr 11 15:22:42 2024 +0800

    sources removed but loops exist and maze generated
```

Figure 10: gitlog2