Labyrinth Project

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Degree program: Bachelor's and master's in science and technology (Computer science)
Year of studies: 2022
Date: 4.2.2023

General Description

The program will create and draw a labyrinth on a screen. Created labyrinth will also have overlapping and undercutting routes with "weave-type" labyrinth. Player-controlled character is placed inside the labyrinth and player's task is to escape it. Program will use algorithm to generate labyrinths that use specific parameters that can be changed to allow customized labyrinths. Generated labyrinth will have one or more exit points and an option for program showing the correct path. Labyrinth's size and number of exits will vary with given parameters.

I will aim to fulfil requirements for demanding category by creating a graphical interface, having adjustable size, making the program scalable, including a scoreboard, having the screen move with player so the labyrinth isn't limited to visible screen and polishing the gameplay. Player will also be able to save a generated labyrinth to a file and play it again.

Functionality

When the program is launched the user can interact with a menu. Menu contains options "start game" (which launches the game), "how to" (which includes instructions), "leaderboard" (which displays scoreboard), "options" (which will give player ability to change some parameters such as map size), "custom level" (which lets player choose a saved labyrinth to play again) and "exit" (which quits the program). By clicking "start game" the program generates a labyrinth and begins the game.

After the labyrinth has been generated, the program will set a playable character inside the labyrinth. Player will be able to control the character using WASD or arrow keys. After player reaches the end of a level a new level will start with harder parameters by making the labyrinth bigger and decreasing the number of exits. After the player starts moving a timer will appear that limits the time the player has to escape the labyrinth. If the time runs out, the player can save their score in scoreboard and begin again from the first level. The timer resets after every level and by clearing the level within the time limit, the player is awarded points based on their time and current level. After the level player is also given the chance to save the level played. The timer will use the same algorithm that reveals the correct path to calculate how much the player should have time.

Other sections in the menu include additional smaller features to polish the gameplay. How to section serves as overall instructions on how the game is played to not require understanding of the documentation or code. Leaderboard lets player view current scoreboard. Options let player set custom parameters for level generation, such as map size. Changing level generation parameters will reset scoreboard. Options also let player rebind movement keys. Custom levels will let player load saved levels and replay them. Exit button will simply close the program.

THE LABYRINTH GAME

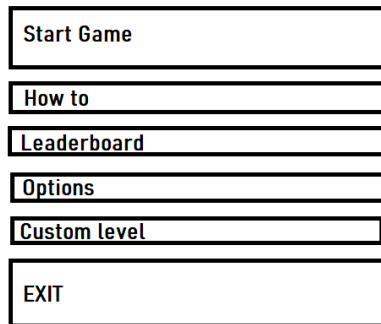| Start Game |
|---|
| How to |
| Leaderboard |
| Options |
| Custom level |
| EXIT |

1:00 Level 1 Score: 45

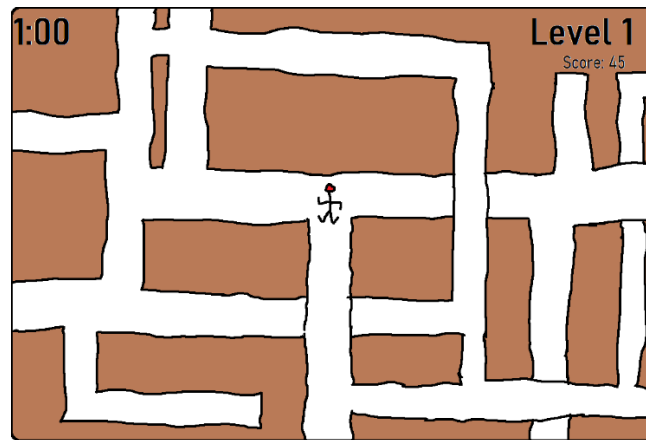Figure 1. Menu draft   Figure 2. Level draft

Player will be able to start the game through GUI menu that also let's player access other functionalities. Player interacts with the menu by clicking buttons. By clicking "Start game" a labyrinth is generated, player-controlled character is placed inside the labyrinth and timer starts. Player can control the character with WASD- and arrow keys. The labyrinth will not be limited to the window size and the view will follow the playable character. After player finds the exit, they are awarded points and a new level is generated with harder parameters. Player can open another menu inside a level with esc-key which has options to save current level and giving up. If the player "gives up" a correct path is shown.

Files

There are three different types of files that the program saves and loads. First of all, the player can save and load labyrinths. Data includes a representation of the level using characters. Secondly scoreboard it stored in a file to keep track of scores. And finally, there is a separate file to save settings that are adjustable such as map size and key bindings.

Errors

One error that probably will happen is giving the program an incorrect input such as pressing a key that the program does not recognize. Program will first try to just bypass this, but if this causes an error the program will return to the main menu and print an explanation of the error. User may also try to start the game multiple times and generate labyrinths at the same time. The program will try to prevent this from happening by not letting the user interact with the menu while the game window is running. In addition to errors caused by user there could probably occur an error with level generation if it fails due to incorrect parameters or faulty algorithm. If this happens the program will restart the level generation without user input.