Phase 4 Report

The Game

The Overall Description of the Game:

The Rabbit Trails is a 2D video game, in which a player needs to guide the rabbit (Main Character) without being hit by the eagles (Enemies) to reach the "finish" tile after eating all carrots (Regular rewards). Throughout the map collectables such as watermelons (Bonus Awards), bear traps (punishments), and carrots (Regular awards) have been placed, which can either add or deduct points from the rabbit's score. With that said, there must be caution with hitting bear traps since the rabbit will lose points and having a negative score the user will lose the game. When a player wins the game (i.e., by collecting all the regular awards without getting caught by enemies) the winning screen will be displayed, which the user will see the time and score of the finished game.

Loyalty to the original plan and how the final project varies from the original plan:

We tried our best to be consistent with the structure of the original plan even though we have made modifications as we moved along in the project since we observed flaws and errors in the plan. Here are the main modifications we made to the UML diagram:

- In the UML diagram, we only had one class in the UI package responsible for the menu features. However, we modified it by using the state pattern to partition the UI features of the game into states for better encapsulating the behavior of each state to have a better design.
- New packages such as Pathfinding, Loading Resources, Button, and Mouse manager have been added to the overall project design to divide the responsibilities between each module for following the modularity principle. As a result, each module/component will have a specific responsibility in the program, which improves the quality of the software.

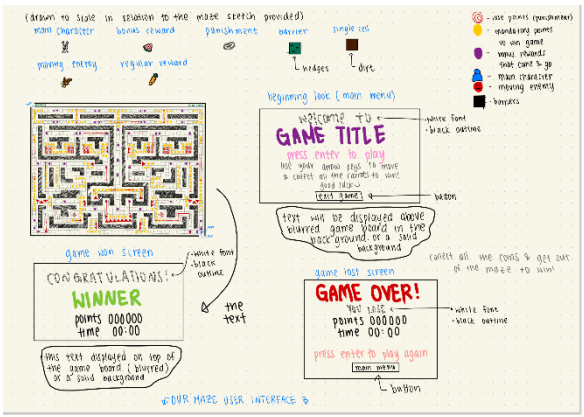
In terms of the UI design, we did not make any drastic changes but here are the minor modifications we made to the initial design:

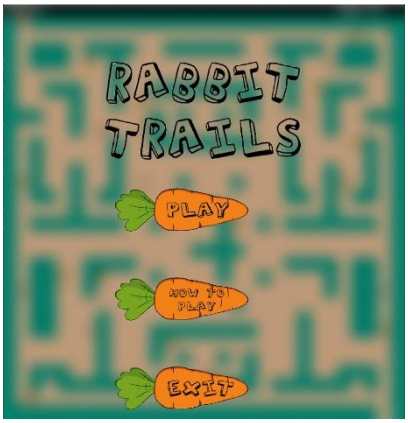
- The walls and dirt tiles have been placed in different positions than the initial design.
- Instead of pressing the enter button for playing the game in the initial design (shown in the below picture), the user only needs to click on the play button in the menu.
- The winning and losing screen does not have the play by pressing the enter button functionality instead the user by pressing the menu button can play again from the menu.

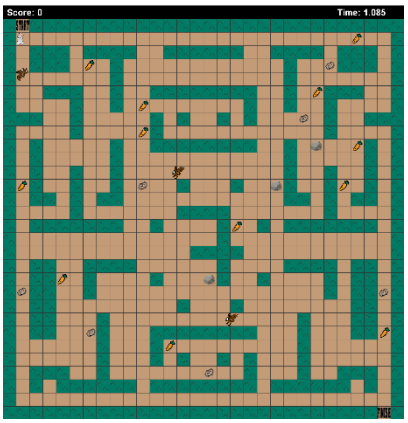
- The user will not see their time and score on the losing screen when have lost the game.
- "How to play" button and screen have been added to the overall design instead of putting the instructions of playing the game in the main menu.

Here is a demonstration of before and after UI design of the project:

Initial UI Design **After**







Important lessons learned from this project:

- Learned to design, implement, and test software since we never had created an application before.
- Understanding that the initial plan and design will be modified due to many factors as given below:
  - Time limitation
  - Flaws and errors in the initial plan
  - Team performance and time management
- The debugging process is more time-consuming than the actual implementation.
- Testing is the most important phase in the software development process since programmers commit mistakes during the implementation and consumers want robust software.
- Making a good design decision during the implementation of software can save time.
- Time management and good communication are crucial for the team project's success.

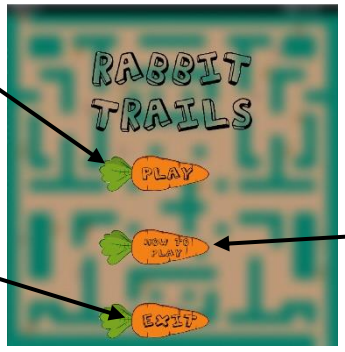
Tutorial

Main features: Here we will briefly explain the menu and all the game features.

By clicking the "Play" button the game timer will start, and the user must control the rabbit since the game has started.

By clicking the "Exit" button the game screen will close.

Game Menu



By clicking the "How to Play" button the right figure will be displayed on screen, which gives the instructions to the user on how to play the game.

How to Play Screen

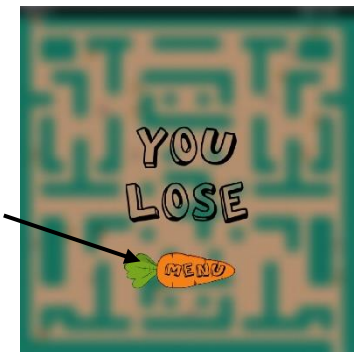
Description:

This screen will be displayed after the user wins the game, which then the time and score of the played game will be shown as indicated by the example.

Winning Screen

By clicking the "Menu" button, the user will return to the Game menu.

Losing Screen



Description:

When the user loses the game, the screen is as displayed by the example. (We will explain the losing scenario in more detail below)

Collectables:

Bonus Reward

Regular Reward

Punishment

The Main character by obtaining each regular and bonus reward will obtain 10 and 20 points, respectively. While the main character will lose 10 points by colliding with the punishments. Keep in mind bonus reward appear and disappear randomly throughout the game.

Moving characters:

Main Character

Enemy

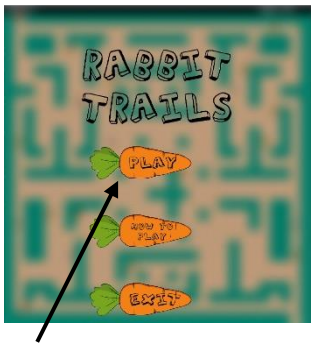
The user uses the arrow keys to move the main character in the map while being careful not to collide with enemies since they follow the rabbit by finding the shortest path between them.

Barriers/Walls:

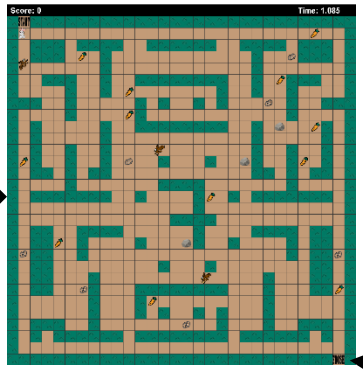
The walls and barriers will block the movement of moving characters placed on the map.

Important Scenarios:

Winning scenario



1. Click the "Play" button in order to start the game.



2. Eat all the carrots placed on the map.

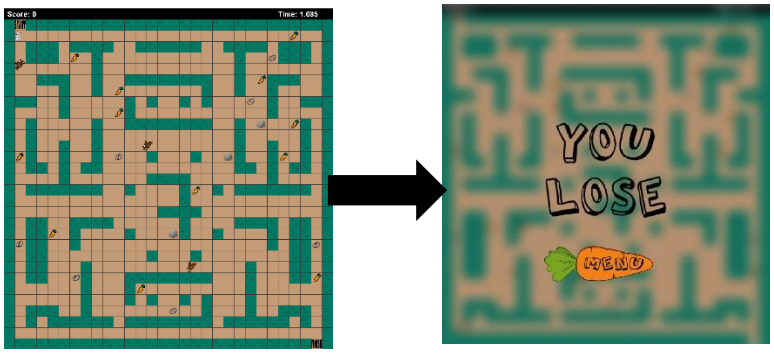
FINISH

3. After eating all the carrots guide the rabbit to reach the "finish" tile (as indicated by the arrow).

4. The winning screen will be displayed after reaching the "finish" tile.

Losing scenarios

1. Hitting the enemies:

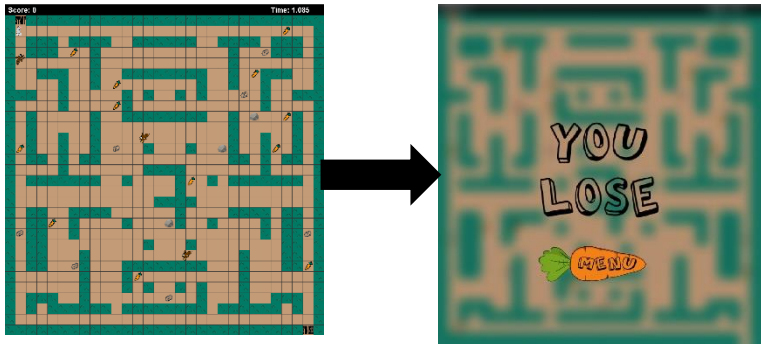


1. The main character (Rabbit) collides with  on the map.

2. After hitting the enemy (Eagle) the losing screen will be displayed as shown above.

or

2. Getting a negative score by hitting punishments:



1. The main character (Rabbit) collides with  placed on the map while having **zero** points.

2. After getting the negative score the losing screen will be displayed as shown above.

Video

Do you want to watch a demo of our game?

Here is the link for it: https://youtu.be/oOIhiXw4gkM