LEWIS UNIVERSITY

SOFTWARE ENGINEERING GROUP PROJECT

CPSC-60500-005

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Group Project Name: Wandering in the Woods Game

(Augmented Reality Room Designer)

Department Of Computer and Mathematical Science

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Introduction

This document describes the software design of the Augmented Reality (AR) Room Designer. In this project we will be making a small game/simulation that has 3 modes, one for K-2, 3-5, and 6-8, K-2 Is just automated while the subsequent modes are more user interactive. For this project we decided to use C# to take advantage of .NET's use of WinForms to quickly make a game without having to dwell too deep in other programming languages. We view this document as being useful for instructors who wish to explore the ideas of the AR Room Designer. We invite critiques and suggestions for improvement of the document and model.

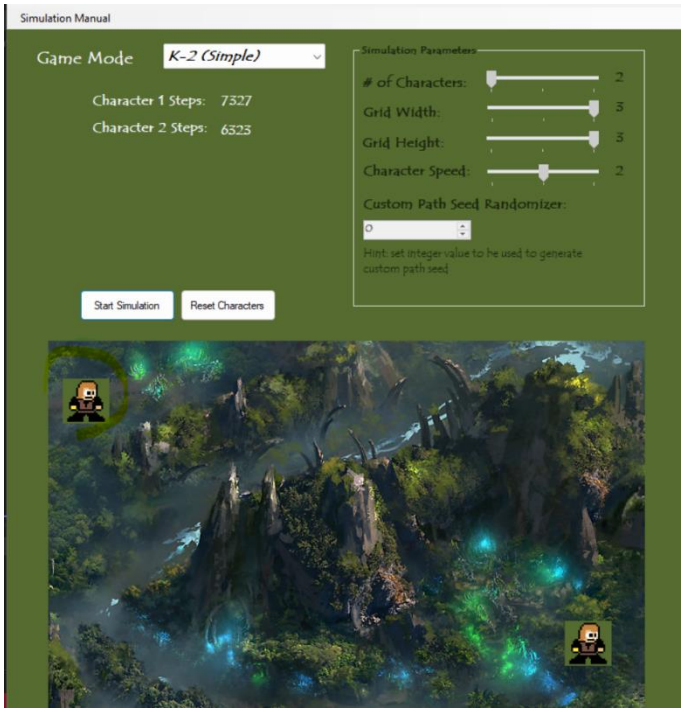
Importance

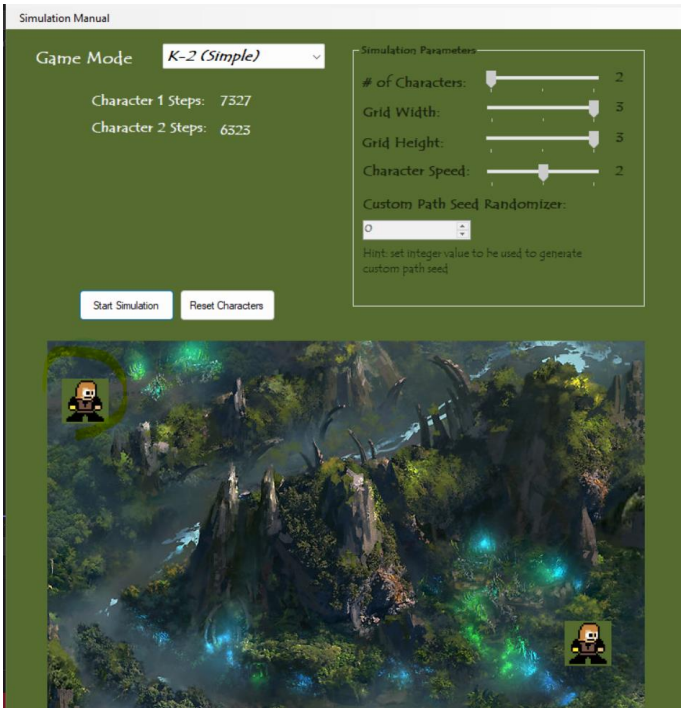
Game Description:

- Wandering in the Woods Game: People are “lost in the woods” where the woods are represented by a rectangular grid.
- The woods are dense, and the people can’t see or hear each other until they are in the same cell of the grid.

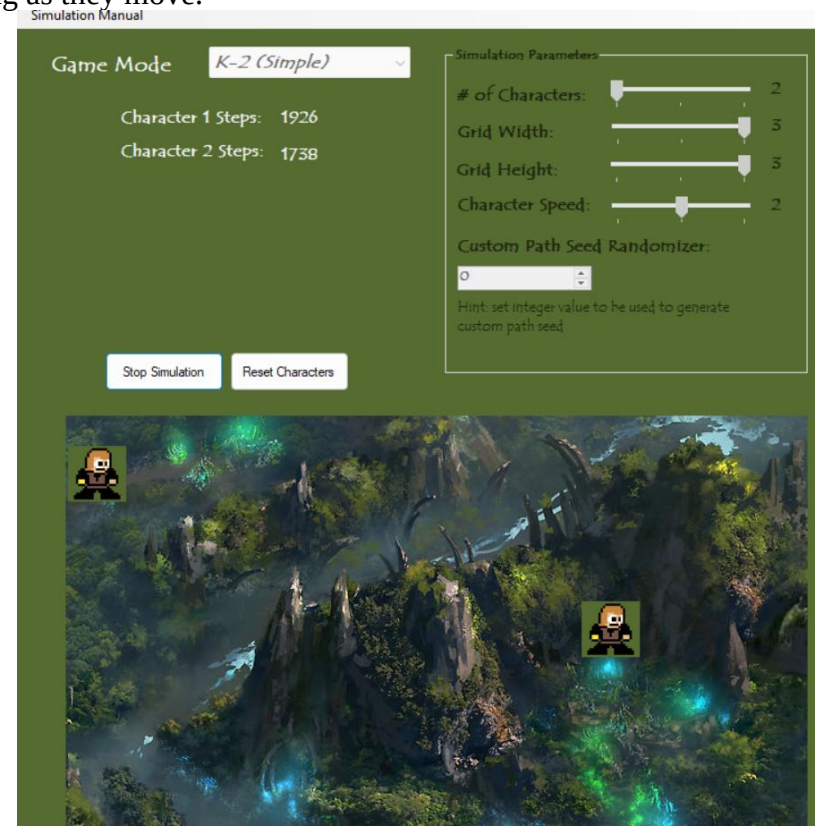
GRADES K-2

- In grades K-2, the grids are always square, there are always two people, and they start out in diagonally opposite corners of the grid.

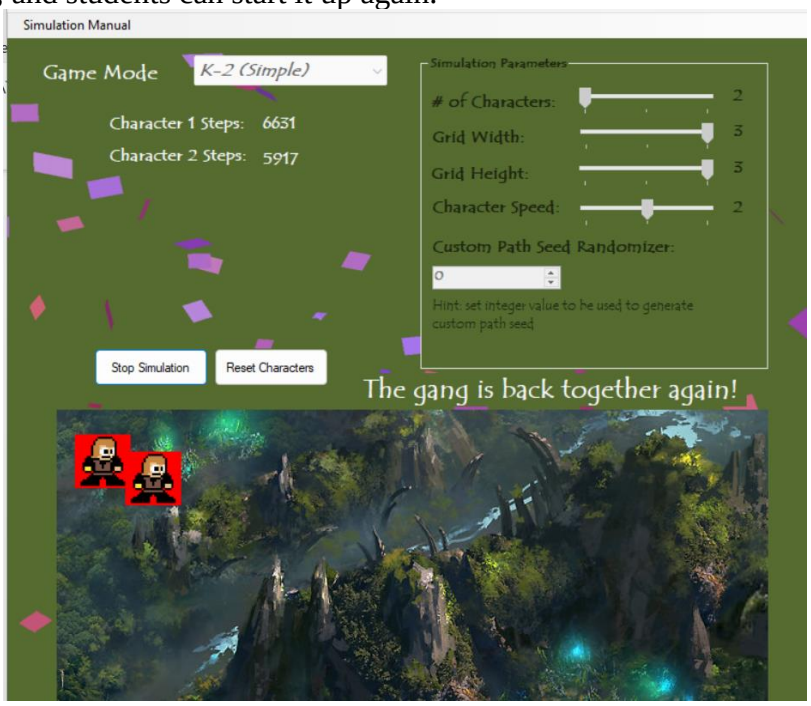




- They wander about randomly, and each move is counted, with a counter for each person. Music plays as cartoon characters wander in the woods. The counter i.e character steps are increasing as they move.

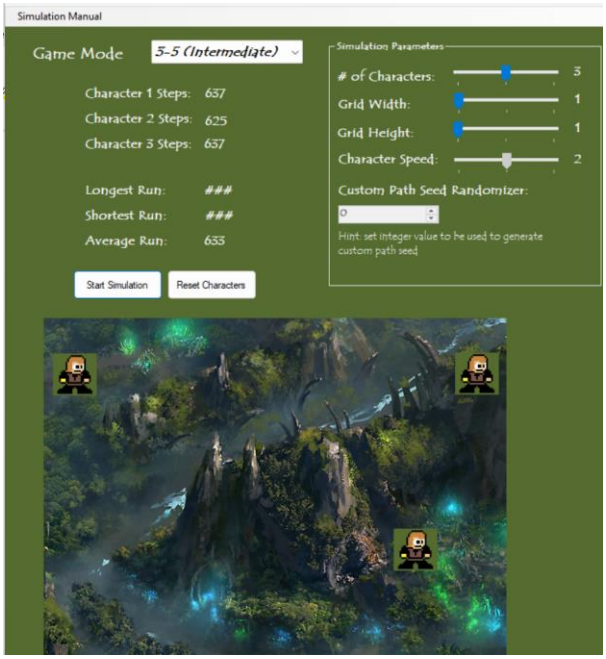


- When the people bump into each other they become red , there is a happy graphics display, and statistics from the wandering are displayed and announced audibly. Then the game is reset, and students can start it up again.

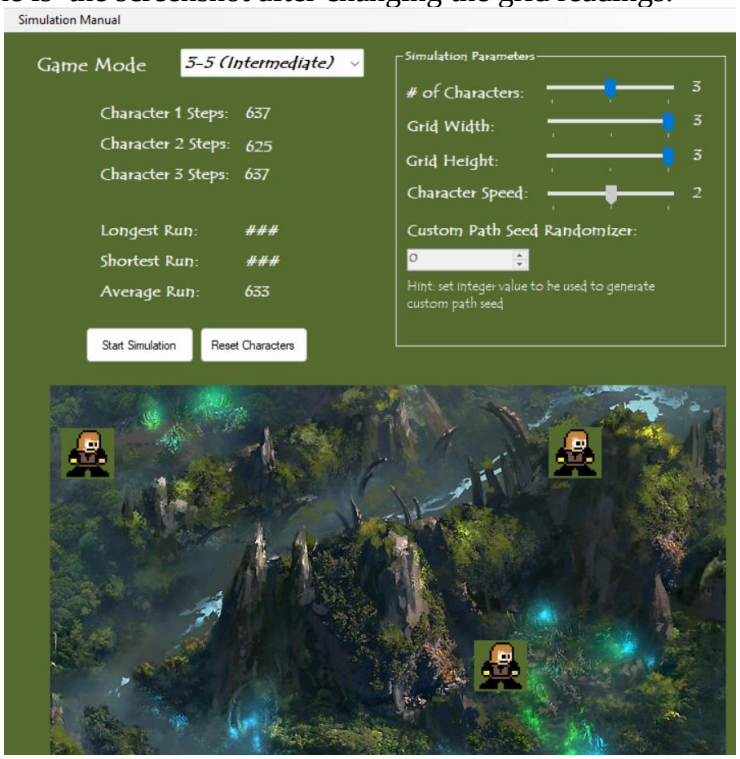


GRADES 3-5

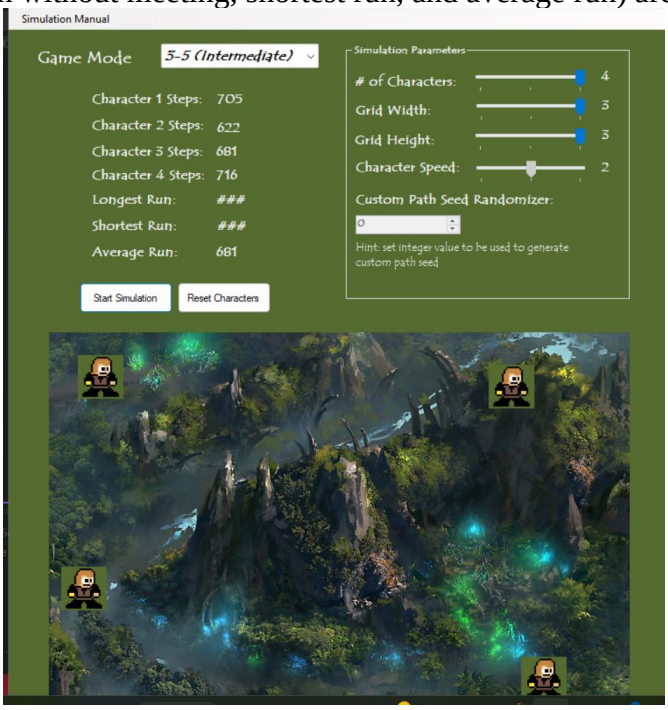
- For grades 3-5, students can set up the size of a grid, which can be rectangular (instead of just square). Here we have the grid adjustability, the following is grid width and height with I reading.



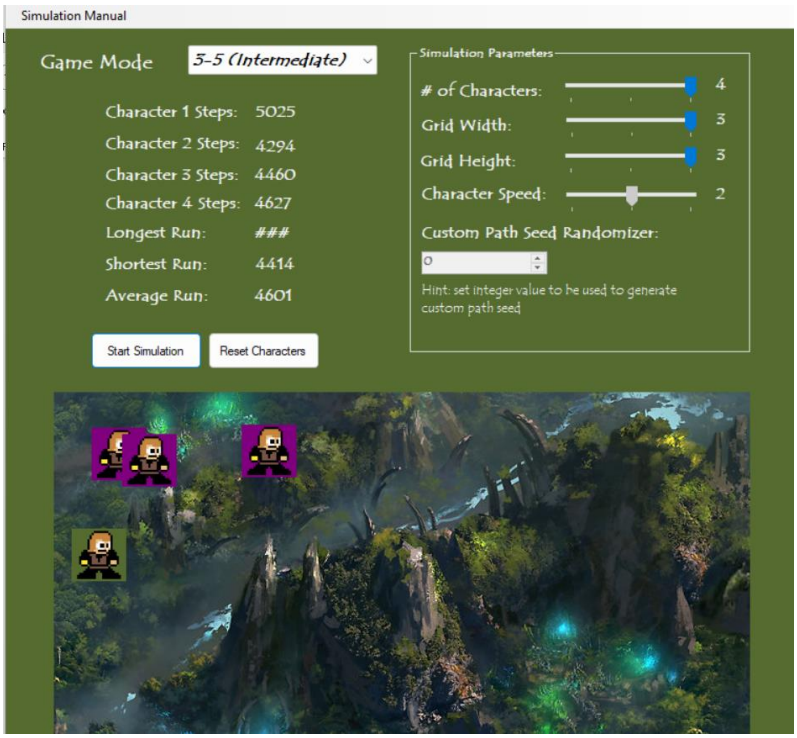
The following the is the screenshot after changing the grid readings.



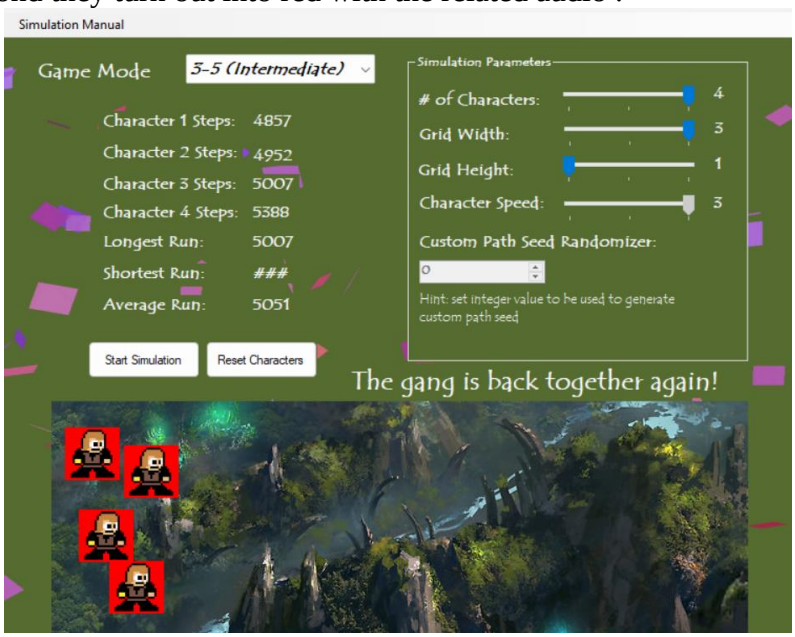
- Here as shown above we have 4 players, and students can place them wherever on their grid. Once the game is started, it can be played and replayed multiple times. Statistics (such as longest run without meeting, shortest run, and average run) are displayed.



- If the game is played with 3 or 4 players, if two find each other, they will be moving together until they find the third player and once any two come closer they turn into purple.



- In the same way, if the third player is found (assuming we have 4 players), the three players will move together until the fourth player is found.
- Once all are fond they turn out into red with the related audio .

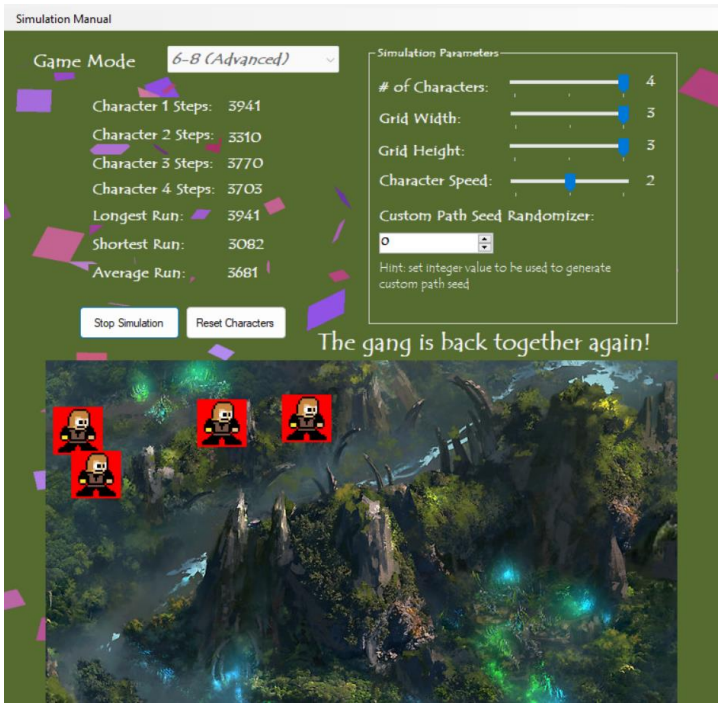


GRADES 6-8

- In grades 6-8, students have all the control of the 3-5 game, but 6-8 students will be challenged to run experiments to determine how the average run varies with the size and shape of the grids. They will also be able to explore different protocols for wandering, and to decide which is the best way to wander if you want to shorten the time it takes to meet up.

The following is the one with grid width 1 and grid height 1 with speed 3.We can look the difference of steps made.

The following is the one with grid width 3 and grid height 3 with speed 2.We can look the difference of steps made.

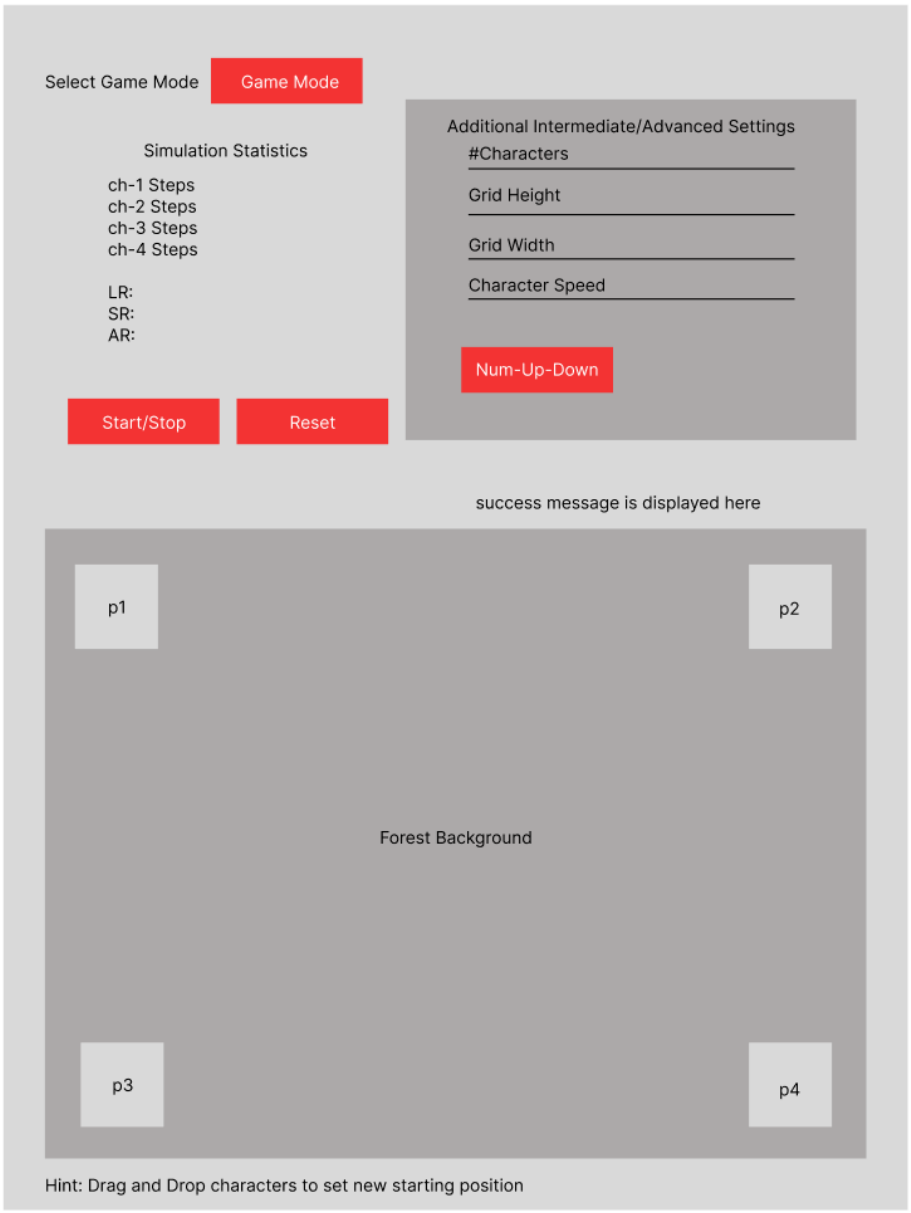


As such, there is difference in the counter of steps due to difference in width, height and speed and also number of characters.

Wandering in the Woods – Design Document

Purpose: The following document contains design documentation developed in order to use as a skeleton and guide during programming and design implementation of the user interface and core functionality of the project.

Game Design Wireframe:



Game State Diagram:

The following stat diagram describes the basic states which the simulation will follow when a simulation has been started by the user.

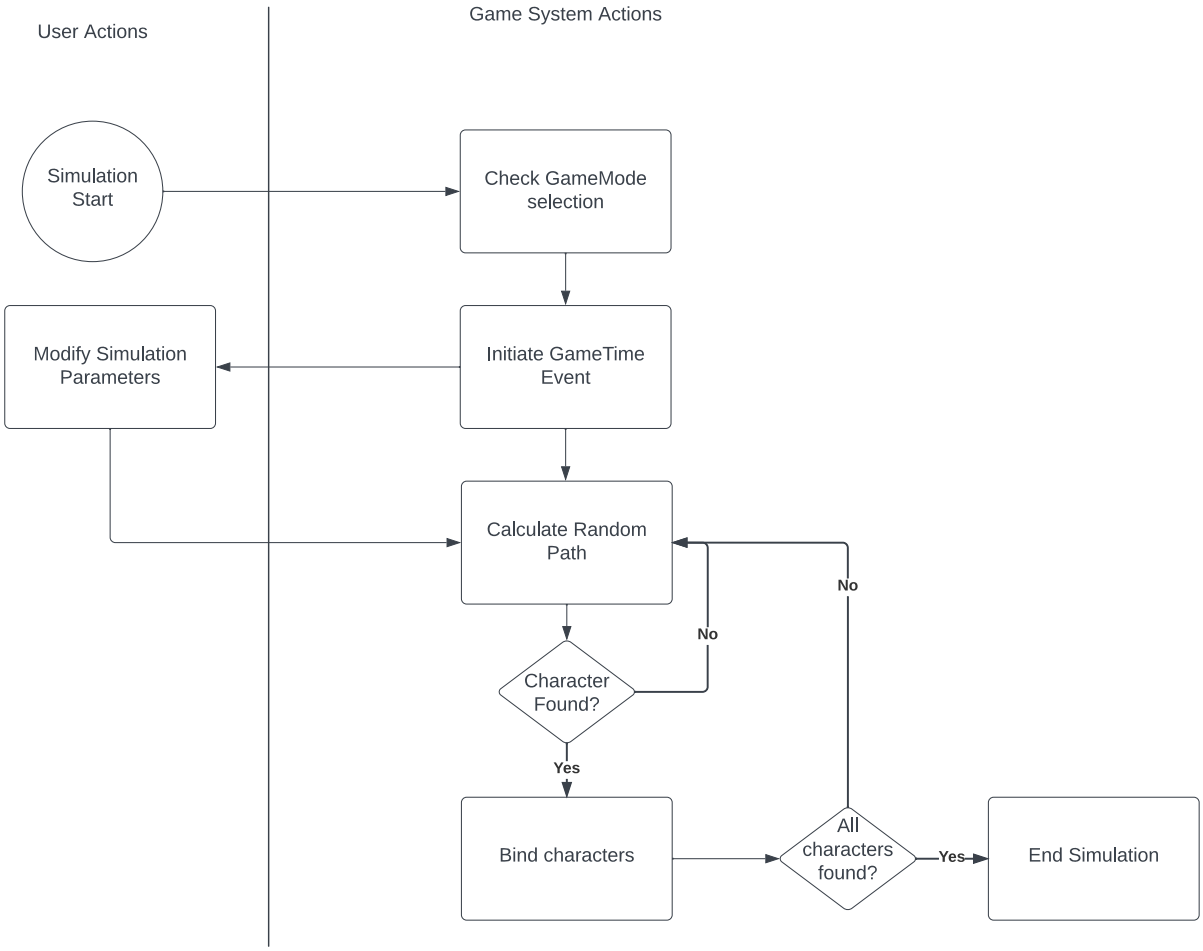
-When a user initiates a simulations, the game system actions check for the gameMode selection from the drop-down values.

-Based on those values, the system starts the GameTime event which handles the character movement events and processes the simulation parameters that have been added by the user.

-Once game parameters are set, the game system dynamically calculates random paths for each characters.

-The game system then checks if characters have been found, if true it binds characters, if false it continues to calculate random paths.

-If characters are found, the system checks if all characters are found, if false then the simulation continues, if true then the simulation ends.



Game Simulation Use Cases:

Use Case 1: Game Mode K-2

Primary Actor:	Students Grade K-2
Preconditions:	A student must select the K-2 option from the simulation drop down.
Description:	As a K-2 student, I want to be able to run a simulation of two characters, I want to be able to see characters move in a grid, I should be able to see the amount of character steps that both characters have taken. When both characters find each other, I want to be able to audibly be notified that both have been found and see an animation being played. I want to see final statistics at the end of the simulation.
Acceptance Criteria:	I can set the game to K-2 mode and play with the given game tools

Use Case 2: Game Mode 3-5

Primary Actor:	Students Grade 3-5
Preconditions:	A student must select the 3-5 (intermediate) option from the simulation drop down.
Description:	As a grade 3-5 student, I want to be able to have all the functionality that K-2 students have, but also have more in-depth statistics such as average run, shortest run, and longest run. I want to be able to add more characters to the screen, modify the grid size, and drag and drop characters in any position in the grid.
Acceptance Criteria:	I can set the game to 3-5 mode and have access to more custom simulation parameters.

Use Case 3: Game Mode K-2

Primary Actor:	Students 6-8
Preconditions:	A student must select the 6-8 (Advanced) option from the simulation drop down.
Description:	As a grade 6-8 student, I want to be able to have all the functionality that K-2 and 3-5 students have, but also have access to more advanced tools that allow me to change the game path behavior that is being used when randomly generating paths for the characters, I want to be able to modify the speed of the characters, and I should be able to modify the random path seed.
Acceptance Criteria:	I can set the game to 6-8 mode and have access to the advanced character path systems.

Game Code Class Diagram:

The following class diagram represents the code path and structure of the game/simulation.