ITERATION 1

Team 7

Project Plan

Team Vision

Our concept is to create a board game where players take turns to roll the dice for movement and choose one of three characters to move around the board in a predefined path, with the goal to have all 3 characters on the final space. Many spaces will affect the character in some way, ranging from damage, moving forward or backward along the board, or gaining a temporary benefit. If a character runs out of health they will respawn at the last checkpoint passed along the board. If a character lands on a space with an enemy character, they will inflict damage on each other. The target audience for our game is anyone who loves to play board games.

Features

- Game characteristics
  - 2D
  - Offline
  - Single device multiplayer mode
- Simple Objective - Get all three of your characters to the end tile to win the game.
- Components
  - Tiles - road from start to finish
  - Characters - each player will play with 3 characters
  - Dice - to determine character movement
- Engaging gameplay - When you land on a tile, an event will occur.
  - Forward or backward moves
  - Health damage and regeneration
  - Obtain event cards
  - Portals: Takes the character to another tile
  - Quicksand: Capture the character until a certain dice number is rolled
- Event cards - Event Cards will be a form of powerups and special events in our game. We plan to devise different types of wildcards to make the game full of fun. Powerups can affect any characters on the board.
  - Freeze one of the opponent's characters
  - Double your next move

- ○ Choose your steps
- ○ Deduct opponent's next move
- ○ Inflict damage
- ○ Heal damage
- A mix of tactical play and luck - When a dice is rolled, the player can decide on which character to move. The strategy will be formed based on the location of the player's characters, the location of the opponent's characters, and the type of tiles nearby.
- Characters - We will include a wide variety of fictional characters to choose from.

Competitors

- Chutes and Ladders (Snakes and Ladders)
    - ○ Both games have randomized movement
    - ○ Both games also have players move extra distance forwards or backwards if they land on specific spaces [2].
    - ○ Finally, both games share the same goal of reaching the end of the board.
    - ○ Our game is different because the players control 3 different characters and the goal is to get all three of them to the end of the board, instead of just one.
- The Game of Life
    - ○ Both games have randomized movement.
    - ○ Both games have different routes that can be chosen [3].
    - ○ Both games have events on specific spaces throughout the board.
    - ○ Our game is different because, again, you control 3 characters at once.
    - ○ Our game has an HP system and character death, which will send you back to a checkpoint should that happen.
- Trouble
    - ○ Both games have randomized movement.
    - ○ Both games have the players choosing between multiple characters to move.
    - ○ Both games have a mechanic that sends a character back. In trouble it is if you are landed on by another character [4], our game sends them back if their HP reaches 0.
    - ○ Unlike Trouble, our game has checkpoints that characters return to if defeated, instead of always returning to the start of the board.
- Other Differences:
    - ○ Our game has event cards that you hold in your hand and can play at any time. These events range from inflicting damage, gaining extra movement, healing, and more. This adds extra strategy to our game.

Risks

Risks are the potential problems that could arise during the conduction of any kind of project. Risks can be defined in various categories based on the type of project and it is very important that stakeholders identify, understand and deal with them properly. The Following are the risks that could arise during the development of our board game project:

1. Implementing functional and effective AI
   The game should neither be too easy nor be too difficult for players to win. So, we will start with a simple AI and slowly develop its decision-making through many iterations and playtests.
   Risk exposure RE: $= pR * ER = 0.8 * 10 = 8$ hours

2. Effective Graphic Design
   Graphic design must be aesthetically pleasing, functional, and intuitive. This includes character design, board design, and UI. A poor design will make the game unintuitive and possibly unfun as a player fights the menus to do anything. That's why we plan to spend time learning about graphic design to create simple, but effective graphics for the game.
   Risk exposure RE: $= pR * ER = 0.75 * 8 = 6$ hours

3. Time management
   The game must be completed in a relatively short time frame. Ineffective time management can result in stress and frustration among team members and bring about an incomplete project. To mitigate it, we will follow the agile method and use scrum to schedule our tasks and track our progress. We will meet at least twice a week to plan, distribute, review, and complete our assigned tasks.
   Risk exposure RE: $= pR * ER = 0.4 * 20 = 8$ hours

4. Learning Unity and Inkscape
   Most of our team have not used our chosen programs for this project, Unity, and Inkscape, before this semester. Being unfamiliar with the programs can cause inefficient code that causes problems down the line, and taking longer than expected to create art assets. We will budget time for these problems to occur and watch various tutorials to learn how to utilize the programs effectively.
   Risk exposure RE: $pR * ER = .6 * 15 = 9$ hours

5. Game Balance
   The game being fair to all players is a large concern. Whereas AI design encompasses it playing fairly and intelligently, game balance is also taken into account Player vs Player gameplay. This includes all characters being viable, and the event cards not being too

powerful or too weak. To solve this problem, we will be performing many playtests throughout the semester and collecting data on win rates and pick rates. With this data we can determine both player perception of strength, and what is actually too strong or too weak.

Risk exposure RE: pR * ER = .5 * 10 = 5 hours

Current Design

Fig - Game screen

- Dice roll mechanism
  - Dice object - It is a Unity game object which handles the graphics, animation, and state behavior for the dice roll
  - Dice script - A C# script with an implementation of Dice class. The class incorporates the methods and properties required for the dice roll mechanism. The script is attached to the dice object.
  - Dice states
    - DiceStart - Initial state of the dice showing face 1
    - DiceRoll - State with dice roll animation
    - Dice# - State with dice face # where # is a number between 1 and 6
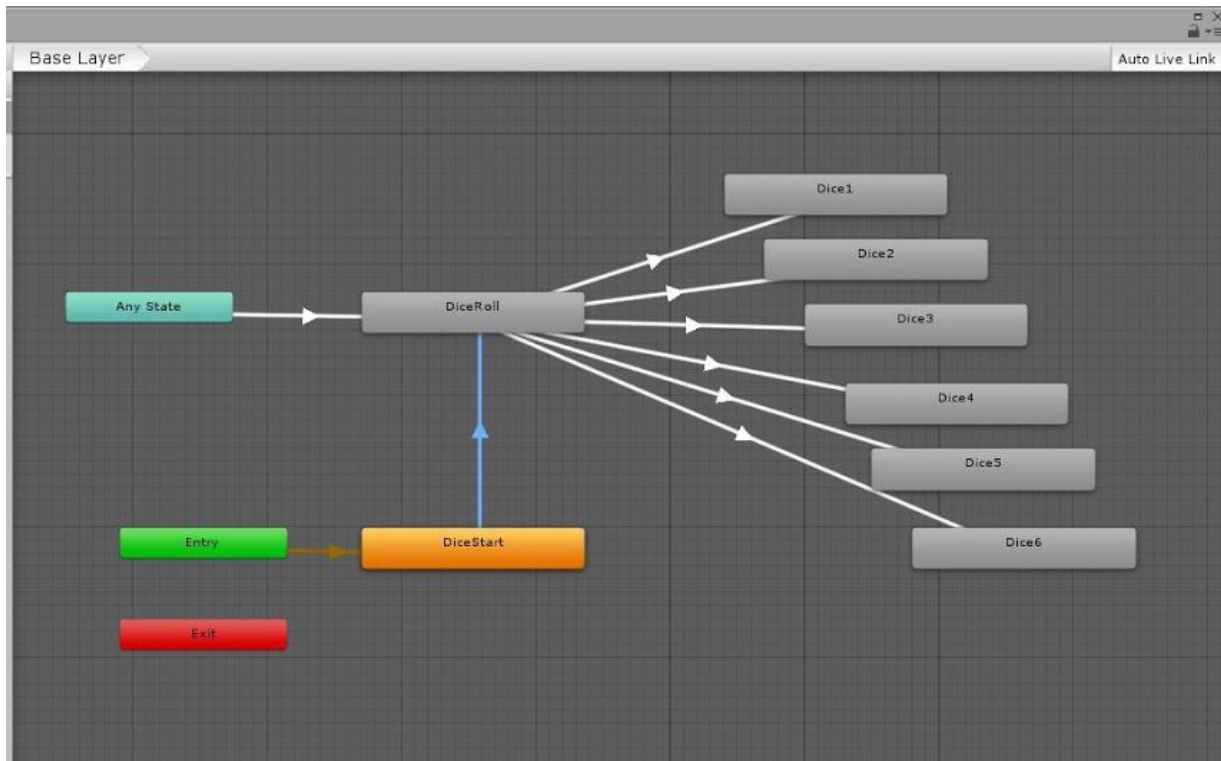
Fig: Dice roll - State Transition Diagram from Unity

- Character movement
  - Character Object - It is a Unity game object which handles the graphics, animation, and state behavior for the player character
  - Character Script - A C# script with an implementation of Character class. The class incorporates the methods and properties required for the character game object. The script is attached to the Character object.

- Character position status
  - On the left panel of the game screen, the player character's status is displayed. As of now, it only shows the the character's position on the game board.

Game Input and Output

Input	Output
Player clicks on the dice	A roll-dice signal is sent to the dice object which changes its state from DiceStart to DiceRoll. After one iteration of DiceRoll state animation, a random number is generated between 1 and 6. The number is then sent as a signal to the dice object again. Depending upon the number received, the dice changes its face. The random number is also sent to the player object where it is used to move the player character across the tiles.

Codes and scripts files

GitHub - https://github.com/ablaze007/BoardGame

References

[1] https://www.theboardgamefamily.com/2015/04/great-family-game/
[2] https://www.thesprucecrafts.com/chutes-and-ladders-snakes-and-ladders-411609
[3]https://web.archive.org/web/20120907013112/http://www.harrogate-scene.com/vintagegames
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[4] https://howdoyouplayit.com/trouble-game-rules-play-trouble/