

# Project Proposal: JavaFX-based Multiplayer Snake Game

## Project Title

- JavaFX-based Multiplayer Snake Game

## Team Members

- Chris Ding
- Mingjun Jin
- Justin Li
- Zhiyuan Wang

## Project Overview

- This project aims to develop a multiplayer snake game using JavaFX. The game will support two players who can play either on the same computer or over a network. Snake game is a classic casual game, and through this project, we aim to enhance it with modern multiplayer functionality to provide a richer and more engaging gaming experience.

## Objectives

- Develop a feature-rich snake game with smooth controls and graphics.
- Implement multiplayer functionality supporting two players locally or over a network.
- Create a user-friendly interface using JavaFX.
- Ensure smooth and efficient game performance.

## Project Details

### 1. Research and Planning:

- Study existing implementations of snake games and design the game architecture.
- Determine the technologies and frameworks to use, including JavaFX and Java Networking APIs.

### 2. GUI Development:

- Use JavaFX to create the game interface, including the game board, score display, and control buttons.
- Design interfaces such as game start menu, game over screen, and settings options.

### 3. Game Logic:

- Implement core game mechanics including snake movement, food generation, and collision detection.
- Design and implement different game modes (single-player and multiplayer).
- 4. Single-Player Mode:**
  - Develop and test the single-player version of the game.
  - Implement basic game loop and scoring system.
- 5. Multiplayer Mode:**
  - Use Java Networking APIs (like Java Sockets) to implement networking features.
  - Allow two players to connect over a network and play the game.
- 6. Testing and Debugging:**
  - Conduct comprehensive testing to identify and fix any bugs or issues.
  - Ensure stable operation of the game across different network environments.
- 7. Final Optimization:**
  - Add additional features such as power-ups, game settings, and leaderboards.
  - Enhance user interface and user experience.
- 8. Documentation and Presentation:**
  - Prepare project documentation covering design, implementation, and testing processes.
  - Create project presentation documents and demo videos.

## Key Technologies, Frameworks, and Libraries

- Programming Language: Java
- GUI Framework: JavaFX
- Networking Technology: Java Networking APIs (Sockets)
- Development Environment: IntelliJ IDEA, Eclipse, or any preferred Java IDE
- Version Control: Git
- Project Management: Trello or JIRA

## Work Allocation

- **Chris Ding:**
  - Responsible for research and planning, determining the choice of technology and framework.
  - Participated in the implementation of game logic, especially the movement of snakes and food generation mechanism.
- **Mingjun Jin:**
  - Responsible for GUI development, creating the game interface, including the game board, score display, and control buttons.

- Implemented the game start menu, game end screen, and settings options.
- **Justin Li:**
  - Responsible for the development and testing of single-player mode.
  - Implemented basic game loop and scoring system.
  - Participated in the implementation of multi-player mode, especially the development of network functions (Java Networking APIs).
- **Zhiyuan Wang:**
  - Responsible for the development and testing of multi-player mode.
  - Implemented network connection and synchronization of two-player games.
  - Performed comprehensive testing and debugging, identified and fixed any bugs or problems.
  - Responsible for adding additional features such as props, game settings, and leaderboards.

### **All members:**

Collaborated in document writing and presentation preparation.

Participated in testing and debugging together to ensure that the game runs stably in different network environments.

### **Schedule**

July 15-July 17	Research and planning, determine technology and framework selection  <b>(Justin Li, Chris Ding, Mingjun Jin)</b>
July 18-July 22	GUI development, create game interface  <b>(Justin Li, Mingjun Jin)</b>
July 23-July 27	Game logic implementation, snake movement and food generation mechanism Member

July 28-July 30	Single-player mode development and testing, basic game loop and scoring system  <b>(Justin Li, Chris Ding, Mingjun Jin)</b>
July 31-August 4	Multiplayer mode development and testing, implementation of network functions  <b>(Chris Ding, Zhiyuan Wang)</b>
August 5-August 7	Testing and debugging, identify and fix problems  <b>(Zhiyuan Wang)</b>
August 8-August 10	Final optimization, add additional features  <b>(Zhiyuan Wang)</b>
August 11-August 13	Document writing and presentation preparation  <b>(Justin Li, Chris Ding, Mingjun Jin, Zhiyuan Wang)</b>

## Expected Deliverables

- A feature-rich multiplayer snake game with a polished JavaFX interface.
- Smooth and enjoyable single-player and multiplayer gaming experiences.
- Comprehensive project documentation detailing design, implementation, and testing processes.

## Conclusion

- This project aims to combine classic gameplay with modern multiplayer functionality, offering a user-friendly JavaFX interface. Through this project, players will enjoy a more competitive and engaging gaming experience while showcasing skills in Java programming and JavaFX development.

## References

- [JavaFX Documentation](#)
- [Java Networking](#)