

User Manual

Team Project: Snake Game

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(1) Introduction

The Snake Game is a modern take on the classic arcade game that has entertained generations of players. In this game, you control a snake that slithers around the game board in search of food. As the snake eats, it grows longer, making the game progressively more challenging. The goal is to keep the snake alive as long as possible by avoiding collisions with the walls and the snake's own body.

What sets this version of Snake apart is its customization and versatility. Players can adjust the size of the game board, choose from a variety of colors for the snakes and food, and even enable a borderless mode where the snake can wrap around the edges of the screen. The game also supports both single-player and two-player modes, allowing you to compete against a friend in a head-to-head match.

Whether you're looking for a nostalgic solo experience or a competitive game to play with a friend, the Snake Game offers endless fun with its simple yet addictive gameplay and customizable features. Get ready to test your reflexes, strategy, and patience as you navigate your snake to victory!

(2) Requirements

- For MacOS/Linux

- Environment: MacOS/Linux
- Type of terminal needed: Mac terminal(CLI)/Linux terminal

- For Windows

- Environment: Windows

- Type of terminal needed: Command prompt (CMD)

- Versions

- Windows 10 or later
- macOS High Sierra (10.13) or later
- Linux (any modern distribution)

- JavaFX

- Need to have the environment capable of compiling and running JavaFX, which should be Java Development Kit (JDK) 17 or later

(3) Rules of Snake Game

Objective

The objective of the Snake Game is to navigate your snake around the game board, eat food to grow longer, and survive as long as possible without colliding with obstacles or yourself. The game offers both single-player and two-player modes.

Game Modes

1. Single-Player Mode:

- Control one snake and try to grow as long as possible by eating food.
- Avoid collisions with the walls (if not in borderless mode) and your own snake's body.

2. Two-Player Mode:

- Two players control two separate snakes on the same board.
- The snakes collide with each other, which adds competition to chase the food.

- Each player should aim to grow their snake by eating food and avoiding collisions with walls (if not in borderless mode) or their own snake's body.

Game Controls

- **Single-Player Mode:**

- **Arrow Keys:** Control the direction of your snake.
 - **Up:** Move up
 - **Down:** Move down
 - **Left:** Move left
 - **Right:** Move right

- **Two-Player Mode:**

- Player 1 (Snake 1):
 - **Arrow Keys:** Control the direction of Snake 1.
 - **Up:** Move up
 - **Down:** Move down
 - **Left:** Move left
 - **Right:** Move right
- Player 2 (Snake 2):
 - **WASD Keys:** Control the direction of Snake 2.
 - **W:** Move up
 - **S:** Move down
 - **A:** Move left
 - **D:** Move right

Game Elements

- **Food:**

- Appears randomly on the game board.
- Each time the snake eats food, it grows longer by one segment.

- The player's score increases by one point for each piece of food consumed.
- **Walls:**
 - If the game is not in borderless mode, the edges of the game board are solid walls.
 - In single-player mode, colliding with the wall ends the game.
 - In two-player mode, each player's snake must avoid colliding with the walls.
- **Borderless Mode:**
 - When enabled, the snake can move through one edge of the screen and appear on the opposite edge, making the game more flexible and less restrictive.

End of the Game

- **Single-Player Mode:** The game ends when the snake collides with a wall (if not in borderless mode) or its own body.
- **Two-Player Mode:** The game ends when either player's snake collides with a wall (if not in borderless mode) or their own snake's body. Also the game will end when one player's snake collides with the other player's snake.

Winning

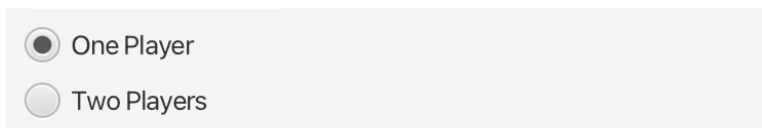
- The goal is to achieve the highest possible score by growing your snake as long as possible.
- In two-player mode, both players can compare their scores at the end of the game to determine who performed better.

These rules are designed to provide a fun and engaging experience, whether you're playing solo or with a friend!

(4) Application Features

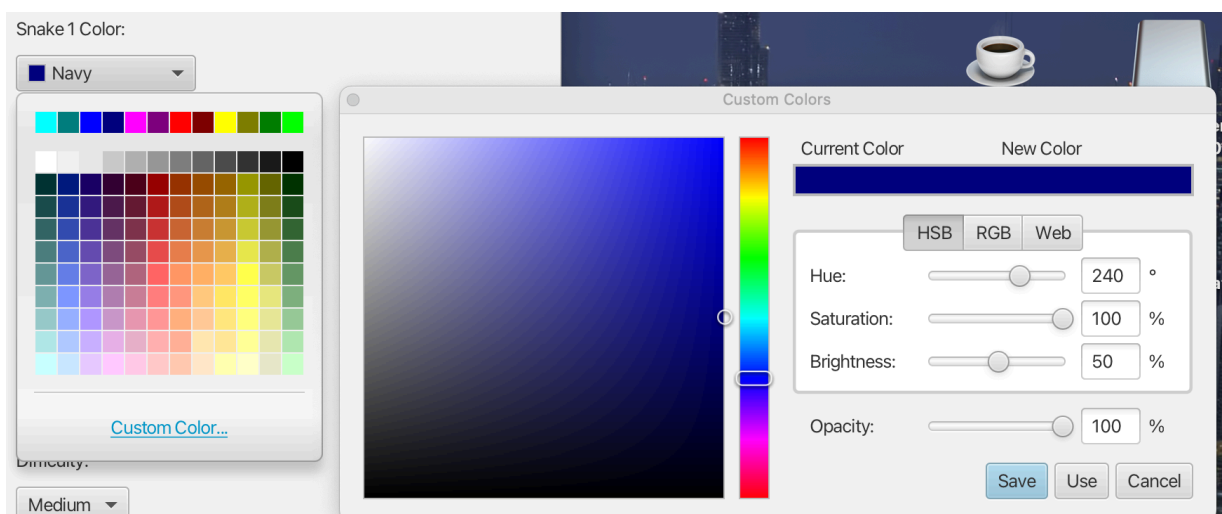
1. Single-Player and Two-Player Modes

- **Single-Player Mode:** Control a single snake and try to grow as long as possible by eating food and avoiding collisions.
- **Two-Player Mode:** Two players can play simultaneously on the same game board. Each player controls their own snake, and the snakes will collide with each other, allowing for competitive yet cooperative gameplay.



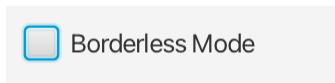
2. Customizable Game Settings

- **Map Width and Height:** Players can set the dimensions of the game board to suit their preferences, with a minimum grid size of 10x10 tiles.
- **Snake Colors:** Customize the colors of Snake 1 and Snake 2 to make them visually distinct.
- **Food Color:** Choose the color of the food that the snakes will consume.
- **Background Color:** Select the background color of the game board to create the desired visual aesthetic.



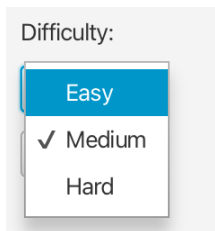
3. Borderless Mode

- **Enable or Disable Borderless Mode:** When enabled, the snakes can move through the edges of the screen and appear on the opposite side, creating a more fluid and less restrictive gameplay experience. When disabled, the edges of the board act as solid walls, adding an additional challenge.



4. Difficulty Levels

- **Adjustable Game Speed:** Choose from three difficulty levels—Easy, Medium, and Hard—which affect the speed of the game. The faster the game, the more challenging it becomes to control the snake and avoid collisions.



5. Dynamic Gameplay

- **Real-Time Movement and Growth:** The snakes move continuously in the last given direction, and their length increases as they eat food.
- **Non-Colliding Snakes in Two-Player Mode:** In two-player mode, the snakes do not collide with each other, allowing both players to focus on navigating their own paths.

6. Countdown Timer

- **Pre-Game Countdown:** A 3-second countdown timer before the game starts gives players time to prepare and get ready to control their snakes.

7. Game Over Screen

- **Score Display:** When the game ends, a Game Over screen appears, showing the scores for each player.
- **Back to Menu:** After the game ends, players can easily return to the settings menu to adjust their preferences and start a new game.

8. Settings Persistence

- **Save and Load Settings:** The game automatically saves your settings to a properties file. When you restart the game, it loads the last used settings, allowing you to pick up where you left off without needing to reconfigure.

(5) Using Scripts to Compile and Run:

Change the `JAVAFX_LIB` Path to your JavaFx lib's path in the scripts you are using

Batch Scripts for Windows:

step 1: cd to scripts

step 2: enter command: `.\temp.bat`

```
PS D:\APPJAVA\Snake\scripts> .\temp.bat
```

Bash Script for Mac/Linux:

step 1: cd to scripts

step 2: enter command: `chmod +x ./run.sh`

step 3: enter command: ./run.sh

```
● (base) hanlin2004914@nuthatch-99 scripts % chmod +x ./run.sh
○ (base) hanlin2004914@nuthatch-99 scripts % ./run.sh
```

(6) Error Handling

Invalid Grid Size

- **Problem:** You receive an error message stating that the width and height must be at least 10 tiles when trying to start the game.
 - **Solution:**
 - Go back to the settings menu and ensure that both the width and height fields have values of 10 or higher.
 - Enter valid numeric values for both fields and try starting the game again.

Game Freezes or Lags

- **Problem:** The game becomes unresponsive or runs slowly, especially on larger game boards or higher difficulty settings.
 - **Solution:**
 - Try reducing the width and height of the game board to decrease the number of tiles being rendered.
 - Lower the difficulty setting to reduce the game speed, which may improve performance.
 - Ensure that your computer meets the minimum system requirements for running the game smoothly.

Color Selection Issues

- **Problem:** The snake, food, or background colors appear incorrect or do not match your selections.
 - **Solution:**
 - Double-check your color selections in the settings menu before starting the game. Ensure you click "Start Game" to apply the changes.
 - If the issue persists, restart the game and try selecting different colors.