

# Snake! Game

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



# Overview of the game

The Snake game is a classic arcade game that originated in the late 1970s and gained widespread popularity in the 1990s, particularly with its inclusion on early mobile phones. The game is simple yet addictive, involving a player-controlled snake that moves around a confined space, eating food and growing longer with each meal.



You may remember it from the Nokia phones from the early 21st century

# Rules of the Game

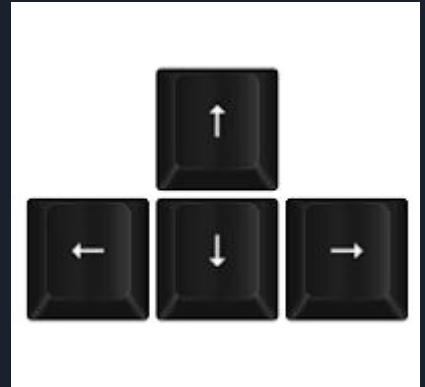
**Objective:** The main goal of the game is to control the snake and eat food items that appear randomly within the game area. Each time the snake eats, it grows longer.

**Controls:** The player usually controls the snake's direction using arrow keys. The snake can move in four directions: up, down, left, and right. The snake can not make a 180 degree turn

**Growth:** Every time the snake eats a piece of food, its length increases by one unit. This makes maneuvering more difficult as the game progresses.

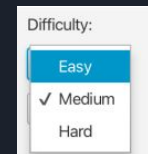
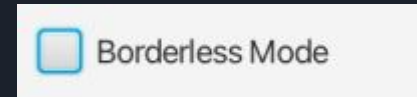
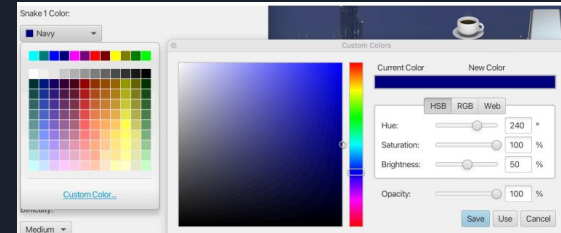
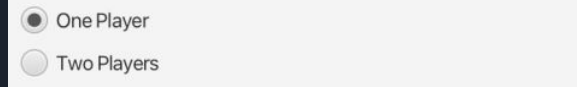
**Collision:** The game ends if the snake collides with itself. This makes avoiding self-collision increasingly challenging as the snake grows longer.

**Score:** The player's score is typically based on the number of food items eaten, which corresponds to the length of the snake.



# Features

- **Single player mode/Two player mode**
  - One player controls the snake with the arrow keys while the other does so with WASD
  - The two snakes do not collide with each other
- **Customizable Settings**
  - The Dimensions of the game could be altered (minimum being 10x10)
  - Snake color
  - Food color
  - Background color
- **Borderless Mode**
  - The walls of the game could be set to disabled
  - When borderless mode it on, when the snake reaches the wall, it will appear on the other side as if it wrapped around the map
- **Difficulty Settings**
  - The game could be set to three different difficulty levels, which affects the pace of the game



# Brief look into the Code

- Borderless Mode
  - This mode is achieved by a global boolean variable called isBorderless
  - Every function that are connected to the snakes' movement and every function that would check the collision of the snakes would have this variable checked.
- Two player mode
  - This mode, like the borderless mode, involves a global boolean variable called isTwoPlayerMode
  - Every function that are connected to the whole game boards' update and initialize would have this variable checked.

```
if (isBorderless) {  
    if (newHead.x < 0) newHead.x = width - 1;  
    if (newHead.y < 0) newHead.y = height - 1;  
    if (newHead.x >= width) newHead.x = 0;  
    if (newHead.y >= height) newHead.y = 0;  
}
```

```
if (!isBorderless && (head.x < 0 || head.y < 0 || head.x >= width || head.y >= height)) {  
    if (snake == snake1) {  
        gameOver1 = true;  
    } else {  
        gameOver2 = true;  
    }  
}
```

```
case W -> {  
    if (isTwoPlayerMode && direction2 != Direction.DOWN) direction2 = Direction.UP;  
}  
case S -> {  
    if (isTwoPlayerMode && direction2 != Direction.UP) direction2 = Direction.DOWN;  
}  
case A -> {  
    if (isTwoPlayerMode && direction2 != Direction.RIGHT) direction2 = Direction.LEFT;  
}  
case D -> {  
    if (isTwoPlayerMode && direction2 != Direction.LEFT) direction2 = Direction.RIGHT;  
}
```

```
if (isTwoPlayerMode) {  
    for (Point point : snake2) {  
        if (food.x == point.x && food.y == point.y) {  
            validPosition = false;  
            break;  
        }  
    }  
}
```

# Brief look into the Code


- Customization
  - A configuration panel that has color pickers that would affect the colors of the individual items
  - Difficulty box that would have the difficulty changed
- Difficulty
  - The game speed would be changed based on the selection on the difficulty choice box
  - Which directly affect how fast the game is

```
menu.getChildren().addAll(  
    new Label("Map Width:"), widthField,  
    new Label("Map Height:"), heightField,  
    borderlessCheckBox,  
    new Label("Snake 1 Color:"), snake1ColorPicker,  
    new Label("Snake 2 Color:"), snake2ColorPicker,  
    new Label("Food Color:"), foodColorPicker,  
    new Label("Background Color:"), backgroundColorPicker,  
    onePlayerButton, twoPlayerButton,  
    new Label("Difficulty:"), difficultyChoiceBox,  
    startButton);
```

```
timeline = new Timeline(new KeyFrame(Duration.millis(300 / gameLogic.getGameSpeed()), e -> run()));  
  
double gameSpeed = switch (difficultyChoiceBox.getValue()) {  
    case "Easy" -> 0.5;  
    case "Medium" -> 1.0;  
    case "Hard" -> 1.5;  
    default -> 1.0;  
};
```



DEMO TIME!



Thanks for watching  
Any Questions?

