SNAKE GAME USING JAVA SWING AND AWT LIBRARIES

SUBMITTED BY:

SANJANA SHAILESH BONGALE

(UIN: 675620038)

SNAKE GAME

Overview:

- The Snake Game is a classic arcade-style game where the player controls a snake that grows in length as it consumes apples (red graphic circle on the window).

- The main objective is to navigate the snake around the game area, avoiding collisions with itself or the walls, while strategically consuming apples to increase its length.

- The game is developed in Java using Swing and AWT libraries.

Key Highlights:

- A classic yet engaging game implementation.

- Utilizes core Java functionalities for game mechanics and user interaction.

- Showcases fundamental programming concepts applied to game development.

TECHNICAL DETAILS & KEY ELEMENTS

Programming Language Used:

- **Java:** The entire game is developed using the Java programming language, known for its versatility and platform independence.

Libraries/Frameworks Utilized:

- **Swing and AWT (Abstract Window Toolkit):** These Java libraries are used for creating the graphical user interface (GUI) components, including windows, buttons, and panels.

Key Elements:

- **Snake:** Controlled by the player using arrow keys, the snake moves across the screen.
- **Apples:** Represented as red graphic circle objects on the screen, the snake must consume these to grow.
- **Game Area:** A confined space where the snake moves, bounded by walls.

GAME MECHANICS : HOW TO PLAY

The game is controlled using the arrow keys on the keyboard.

- **Up Arrow:** Move the snake upwards.

- **Down Arrow:** Move the snake downward.

- **Left Arrow:** Move the snake towards the left.

- **Right Arrow:** Move the snake towards the right.

Objective:

- **Goal:** The primary goal is to guide the snake to eat apples, growing longer with each apple consumed, without colliding with itself or the walls.

- **Challenge:** As the snake grows longer, maneuvering becomes increasingly difficult, adding challenge and excitement to the gameplay.

Inheritance is utilized in the code for classes to inherit properties and behaviors from the parent classes.

Loops are used in methods for iterating through body parts to check collisions, manage the snake movement, etc.

Arrays are used to maintain the coordinates of the snake's body parts.

Conditional Statements such as if-else statements are used throughout the code for conditional checks such as collision, apple eaten, etc.

Switch Statement is used to control the movement of the snake based on the direction ('U', 'D', 'L', 'R') keys used by the user.

Event Handling mechanisms like KeyListener and ActionListener are used to capture keyboard events (KeyEvent) and timer events (ActionEvent).

GUI Manipulation is performed by setting properties of Swing components (JFrame, JPanel, JButton) to create the game window, manage its appearance, and handle user interactions.

LIST OF MECHANISMS AND PROGRAMMING CONSTRUCTS UTILIZED IN THE JAVA CODE FOR THE SNAKE GAME

POTENTIAL IMPROVEMENTS AND ADDITIONAL FEATURES

1. Enhanced Levels: Introduce progressive levels with varying difficulty levels, adding new challenges as the player progresses.

2. Power-ups: Implement power-ups or bonuses that can either help the snake grow faster or temporarily alter gameplay dynamics for added excitement.

3. Multiplayer Mode: Develop a multiplayer feature allowing players to compete or cooperate in the same game space, enhancing the social aspect of the game.

4. Customization Options: Provide options for players to customize the appearance of the snake, and game background, or even introduce themes.

5. Sound Effects and Music: Integrate sound effects or background music to elevate the gaming experience and add ambiance.

DEMO

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WELCOME TO THE SNAKE GAME!
Few Rules before you start:
1. Use the keys mentioned for navigating the Snake:
   Up: The up arrow key (↑)
   Down: The down arrow key (↓)
   Left: The left arrow key (←)
   Right: The right arrow key (→)
2. Press Space bar for the Options Menu.
   You will be given 2 options: 1. Quit Game 2. Restart Game

All the best. Press 'Enter' to proceed.

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- On Execution rules will be displayed on the console.
- The Game will begin once the user presses 'Enter'.

- Window of the game that opens when we start the game.

- The score depicts the existing score.

- The red-colored object depicts the "Apple".
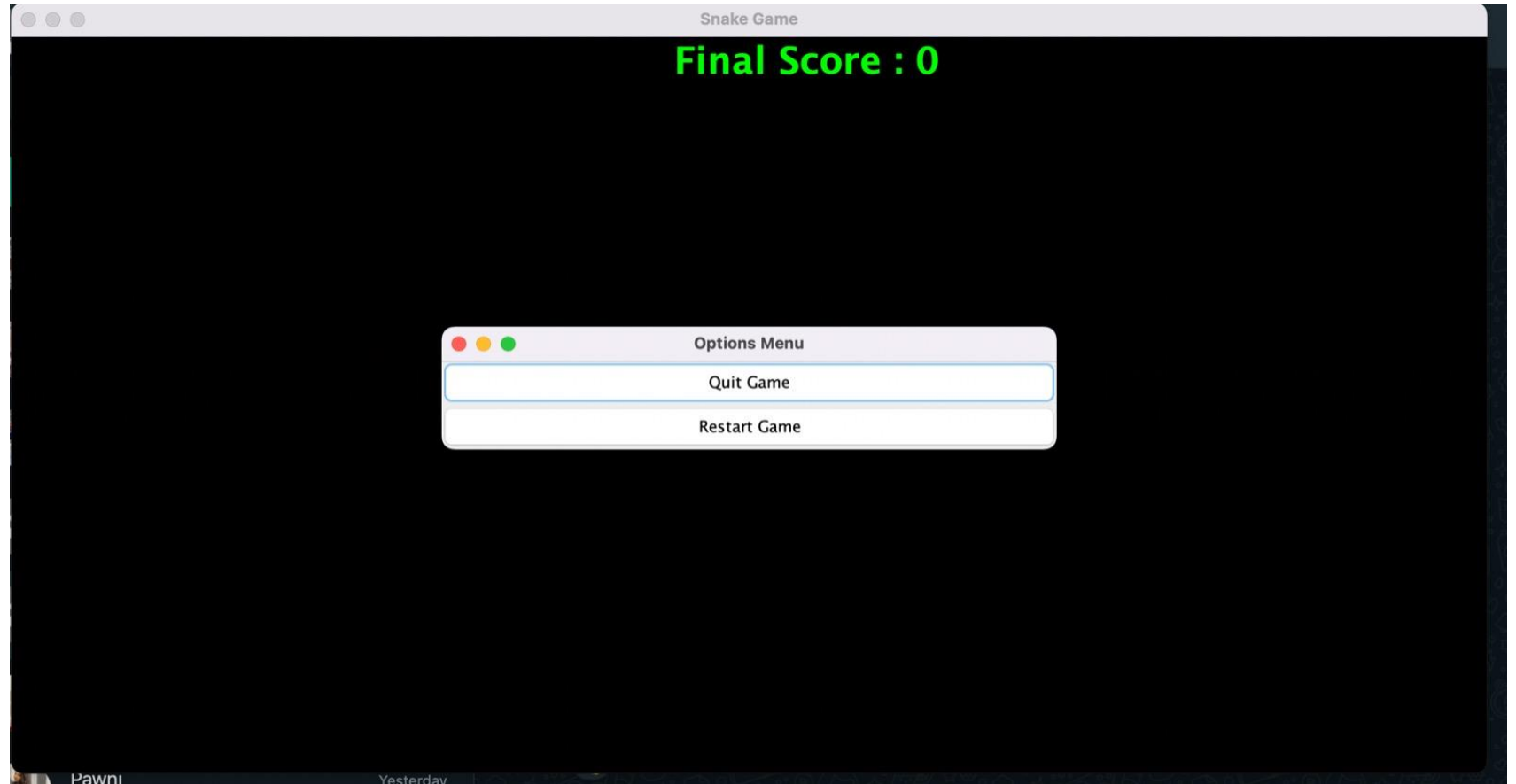
- The green-colored object depicts the "Snake".

- We can see the increment in the score when the object is met by snake which also increases the snake's tail.

- "Game Over!" appears if the snake's head touches the length of it or crosses the game boundary.

- In order to Restart or Quit the game we need to press the spacebar.

- The screen depicts the Options Menu which appears while doing so.

THANKYOU.