Circus of Plates

Final project

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Group 3

Design Description: Circus of Plates Game

Circus of Plates is a JavaFX-based GUI game designed with a focus on maintaining a modular and extensible architecture. The primary design follows the Model-View-Controller (MVC) pattern to separate game data, control logic, and the user interface. Additionally, various design patterns are employed to enhance scalability and maintainability.

Design Patterns Used:

1. **Singleton Pattern:**
    - **Purpose:** Ensures that only one instance of certain system components and controllers exists during runtime.
    - **Application:** Utilized for the Clown object to ensure a single representation of the game's main character.
2. **Factory Pattern:**
    - **Purpose:** Centralizes the creation of GUI elements, generating buttons for the main GUI, and creating new shapes during runtime.
    - **Application:** Implemented for the creation of various game elements such as plates, bombs, and gold objects.
3. **Iterator Pattern:**
    - **Purpose:** Enables the iteration through all GUI components during the initialization phase of the game.
    - **Application:** Used to iterate through the game's GUI components, aiding in their systematic creation.
4. **State Pattern:**
    - **Purpose:** Alters the behavior of character stacks based on the current state of the stack.
    - **Application:** Used to handle different states, such as "Game Over" when time ends , and gameRunningState to ensure the game is running.

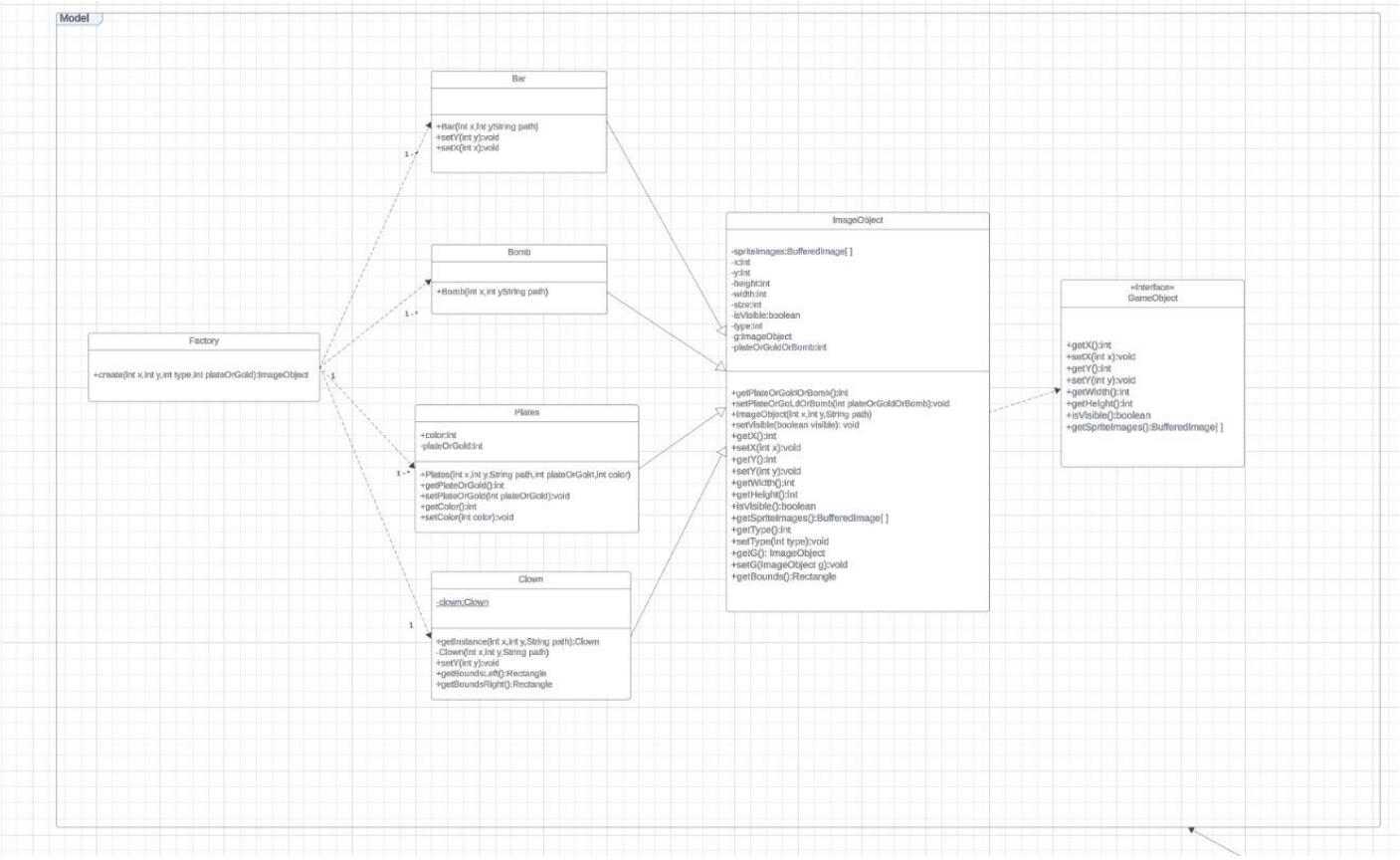
5. **Strategy Pattern:**

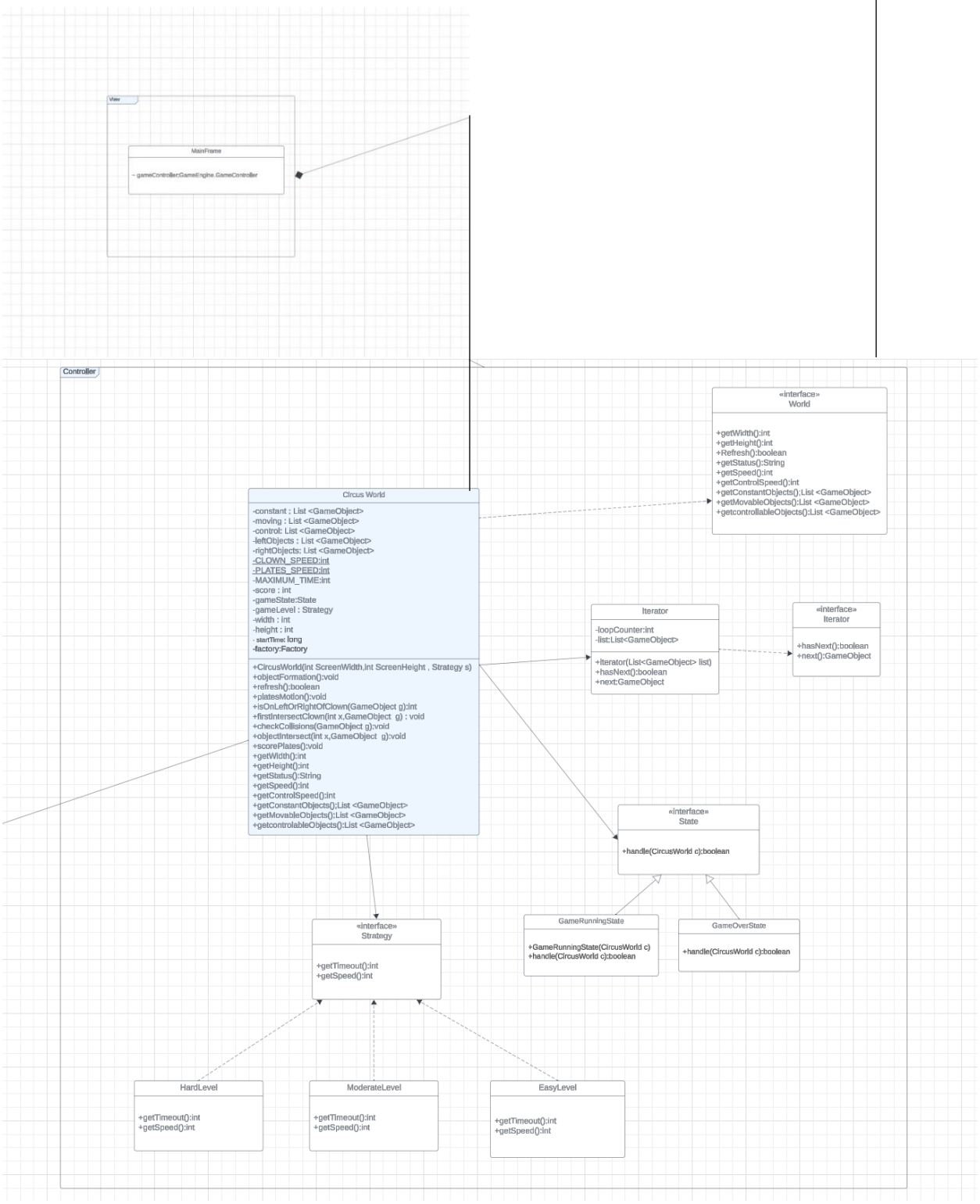
Purpose: Defines a family of algorithms, encapsulates each, and makes them interchangeable. Used for switching between different game difficulty modes.

- **Application:** Employed to differentiate between easy, moderate, and hard modes, adjusting the speed of falling objects accordingly.

This comprehensive use of design patterns enhances the game's structure, making it modular, extensible, and easier to maintain or extend in the future.

UML Class Diagram :





User Guide: Circus of Plates Game

Welcome to the vibrant world of Circus of Plates! In this engaging game, players navigate a lively circus setting, embodying a whimsical clown as their character. The intuitive user interface ensures a seamless gaming experience.

Player Controls:

- The game features a single-player mode, with the main character being the lively clown.
- Control the clown's movement using the Left and Right arrow keys.

Difficulty Levels: Choose your preferred level of challenge with three distinct difficulty settings:

1. **Easy:**
    - Navigate with low speed with falling shapes.
2. **Moderate:**
    - Face a normal speed with falling shapes for a balanced gaming experience.
3. **Hard:**
    - Encounter an added challenge with fast speed of falling shapes.

Scoring System:

- Collect plates to increase your score.
- Collect gold to increase your score by 5 points.
- Beware of bombs, as they reset your score to 0.

Game Controls:

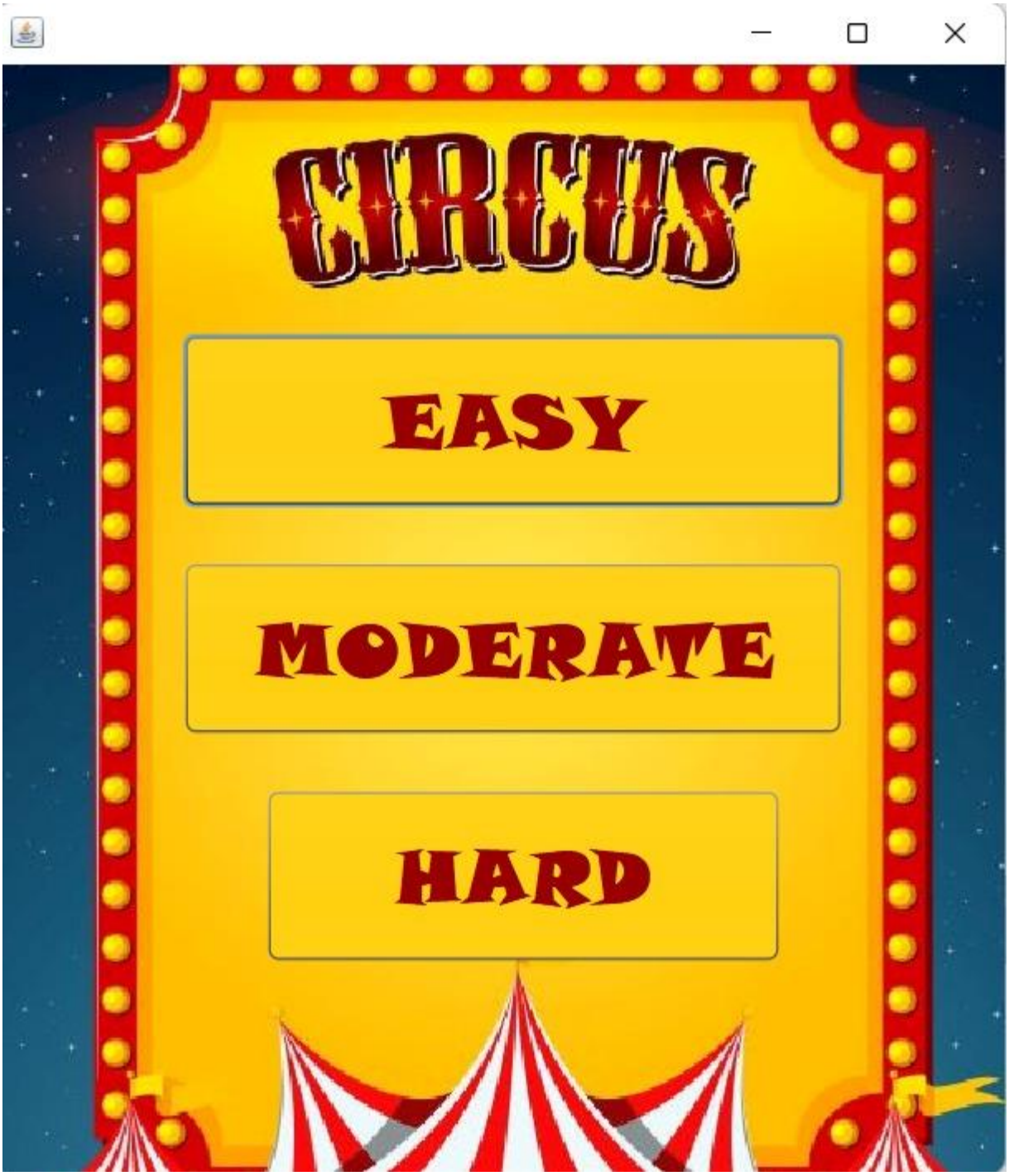
Pause the game and resume play at any time by clicking on the "File" menu.

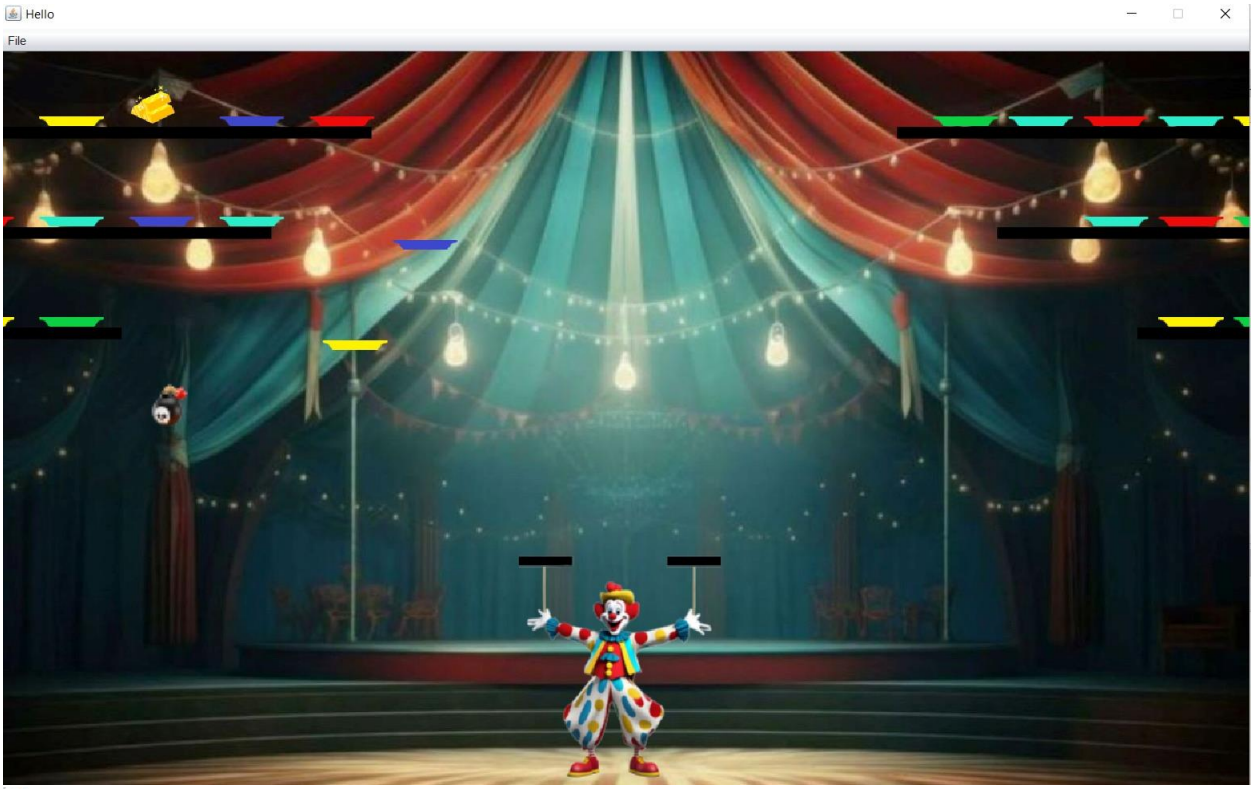
Determining the Outcome:

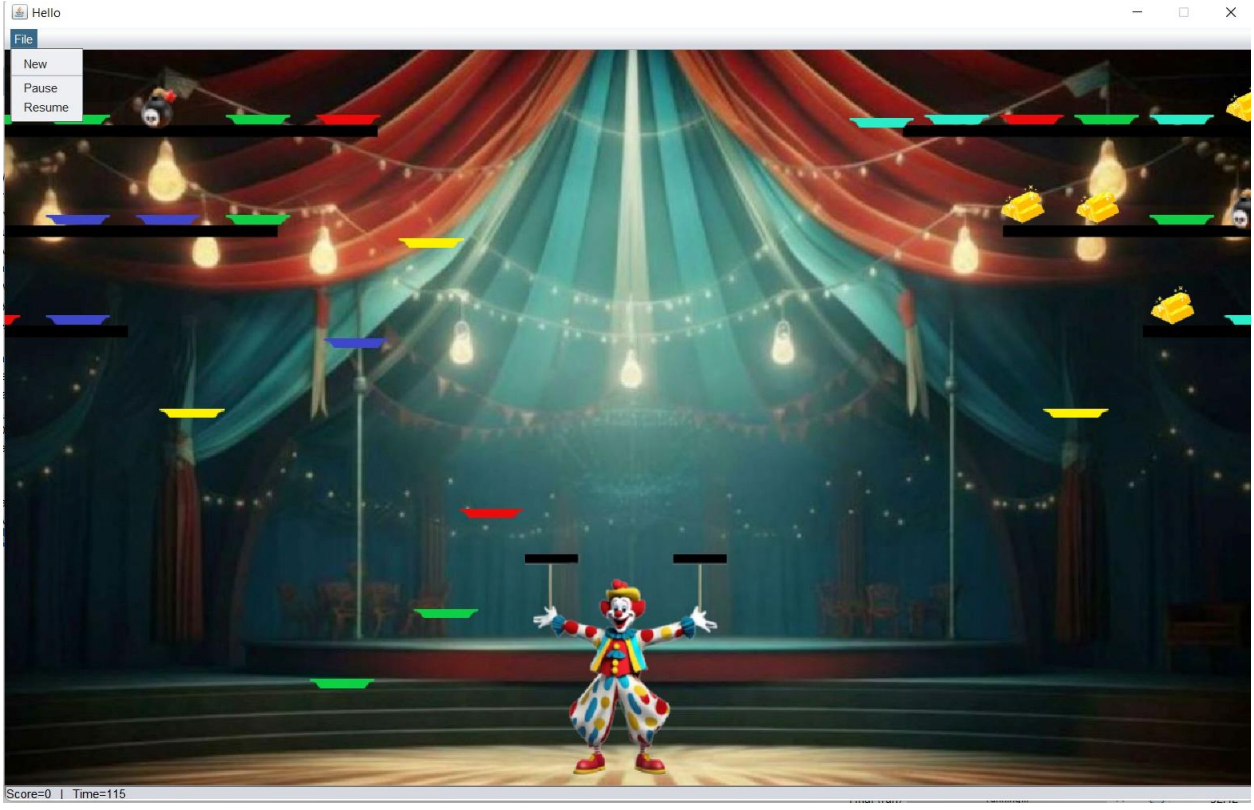
- Focus on achieving the highest score possible within the chosen difficulty level.

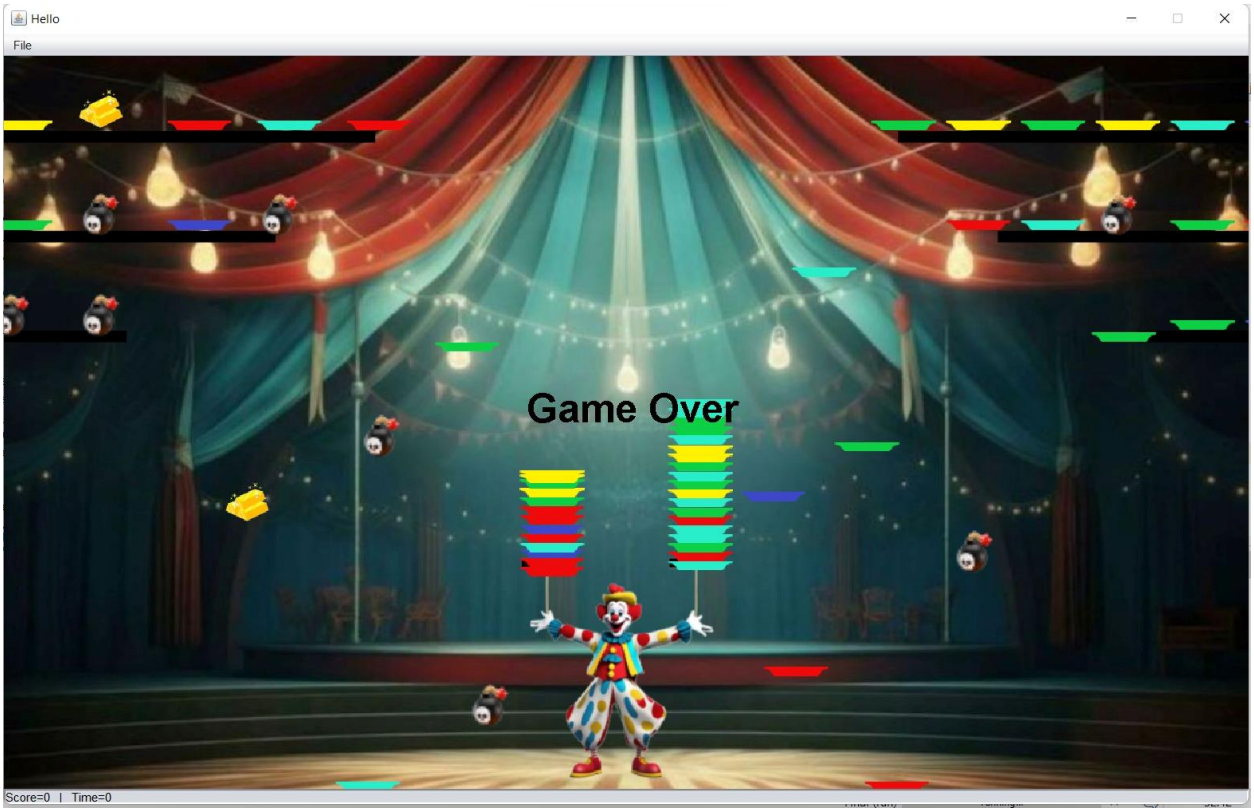
Embark on a circus adventure filled with excitement and challenges. Bring out your inner clown and aim for the high score in Circus of Plates!

Sample Run :




Hello
File


Hello
File
New
Pause
Resume
Score=0 | Time=115


Hello
File
Game Over
Score=0 | Time=0