"Heaven's Light is Our Guide"

Rajshahi University of Engineering & Technology, Rajshahi

Department of Electrical & Computer Engineering

Course Code : ECE 1203

Course Title : Object Oriented Programming

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1.Problem Statement:

Design a Ping-Pong Game using Java Swing.

2.How to Solve:

Game Window Setup: I will create the primary game window employing Java Swing's JFrame class, specifying the window's size and title. The game canvas for rendering will be established as a JPanel.

Paddles and Ball: The paddles and the ball will be realized as graphical elements through Java's 2D graphics capabilities. Specific properties for the paddles, including size and color, and for the ball, including size, color, initial position, and speed, will be defined.

Player Controls: To facilitate control of the player's paddles, I will configure keyboard input mechanisms. Paddle positions will be updated responsively based on keyboard input, enabling both upward and downward movement.

Ball Movement: The physics governing the ball's movement will be implemented to define its initial direction and speed. The ball's position will be systematically updated, taking its velocity into account, to ensure accurate interactions such as bouncing off walls and paddles.

Collision Detection: I will develop a collision detection mechanism to ascertain instances when the ball collides with paddles or encounters the boundaries of the game window. Subsequent to collisions, adjustments to the ball's direction and velocity will be executed.

Scoring System: A scoring system will be engineered to meticulously record and track points earned by each player. The game window will prominently display the current scores to enhance player engagement.

Game Over: Upon reaching the game's conclusion, whether due to a player's triumph or the lapse of a predetermined time limit, I will integrate functionality to present a game-over screen.

Graphics: Leveraging Java's graphic capabilities, I will craft visual representations of key game elements, encompassing the paddles, the ball, and the background. To elevate the game's visual appeal, I will judiciously employ styling elements such as colors and visual effects[1].

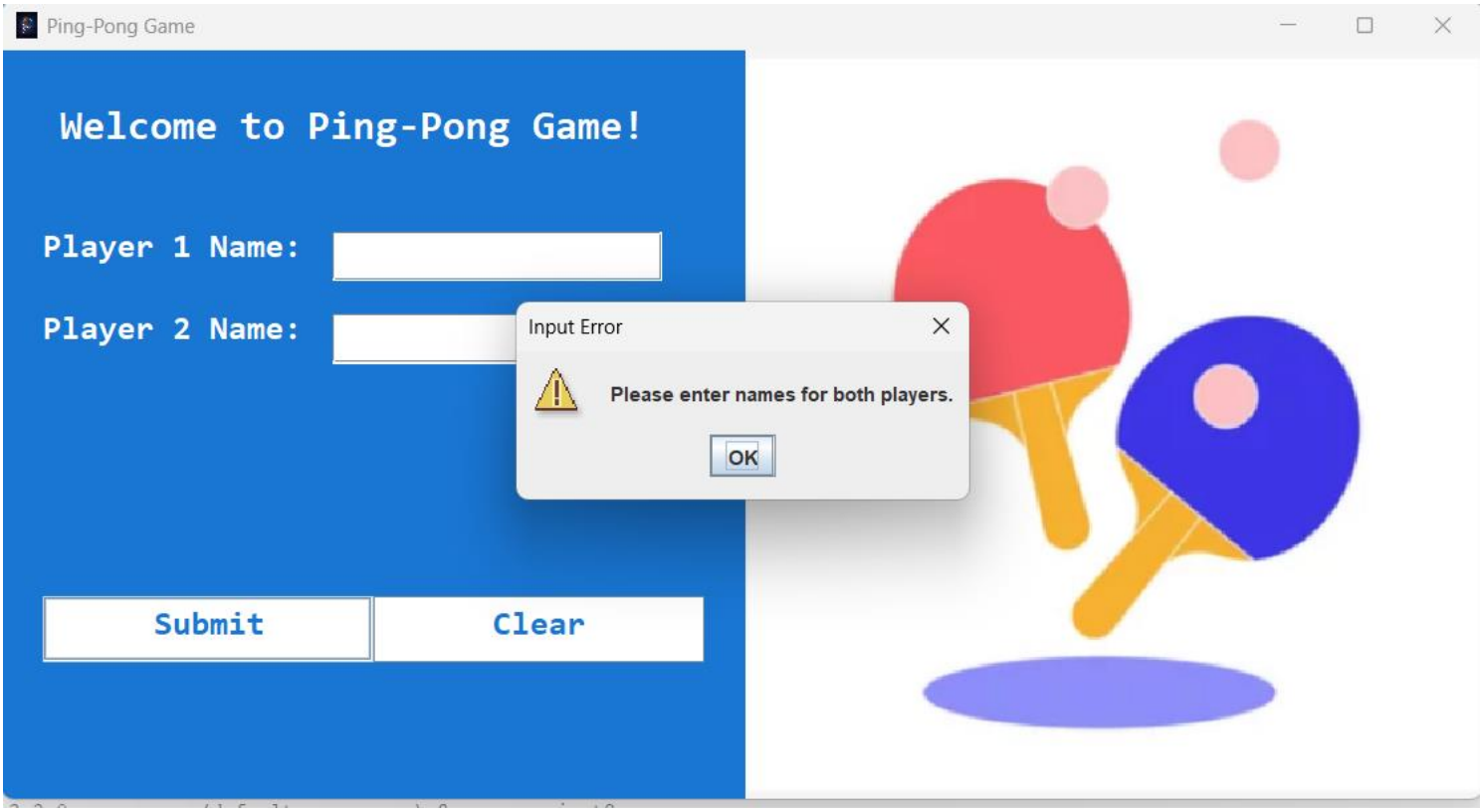
3.Tools:

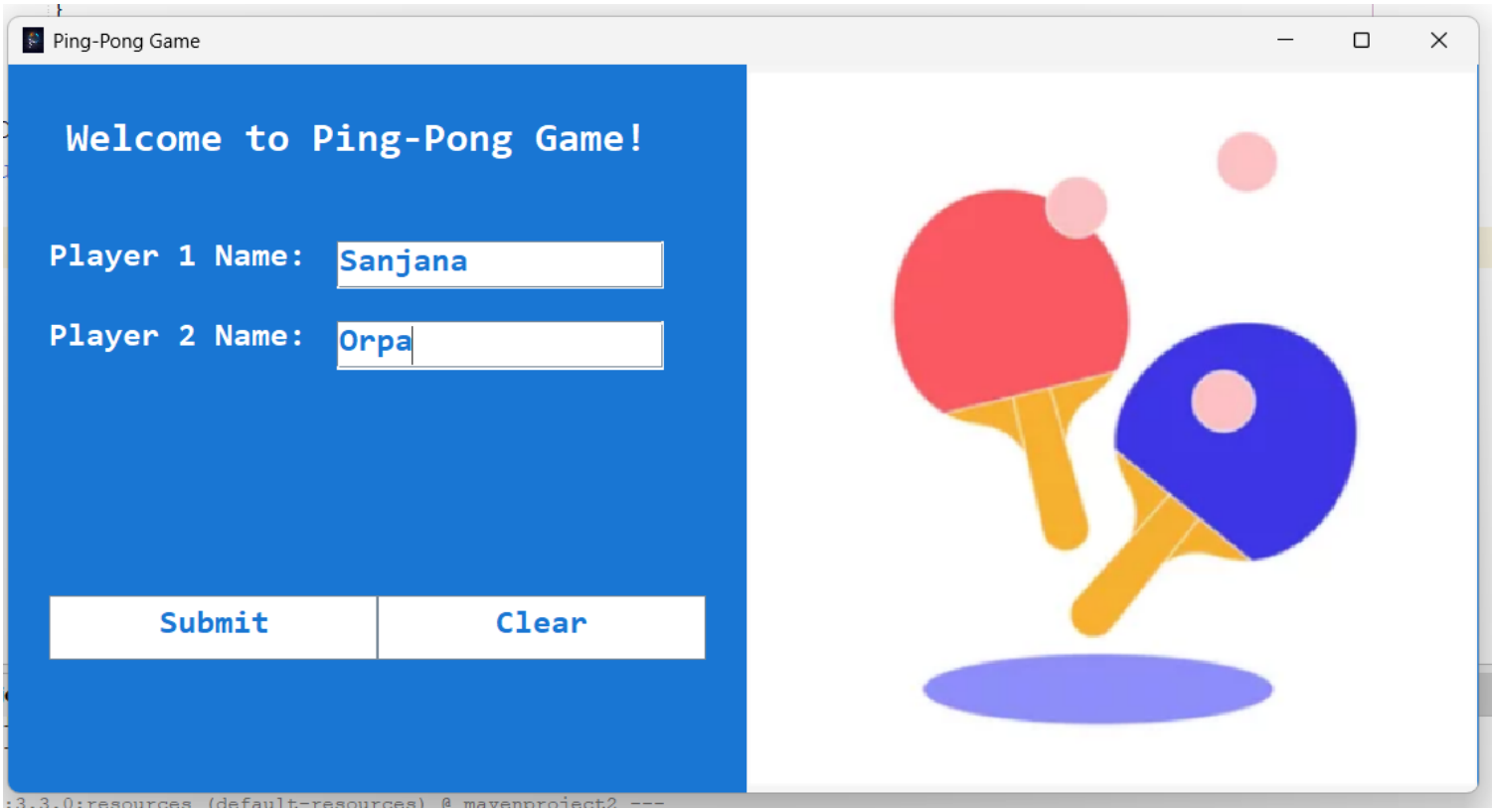
1. Computer
2. Netbeans IDE
3. Internet

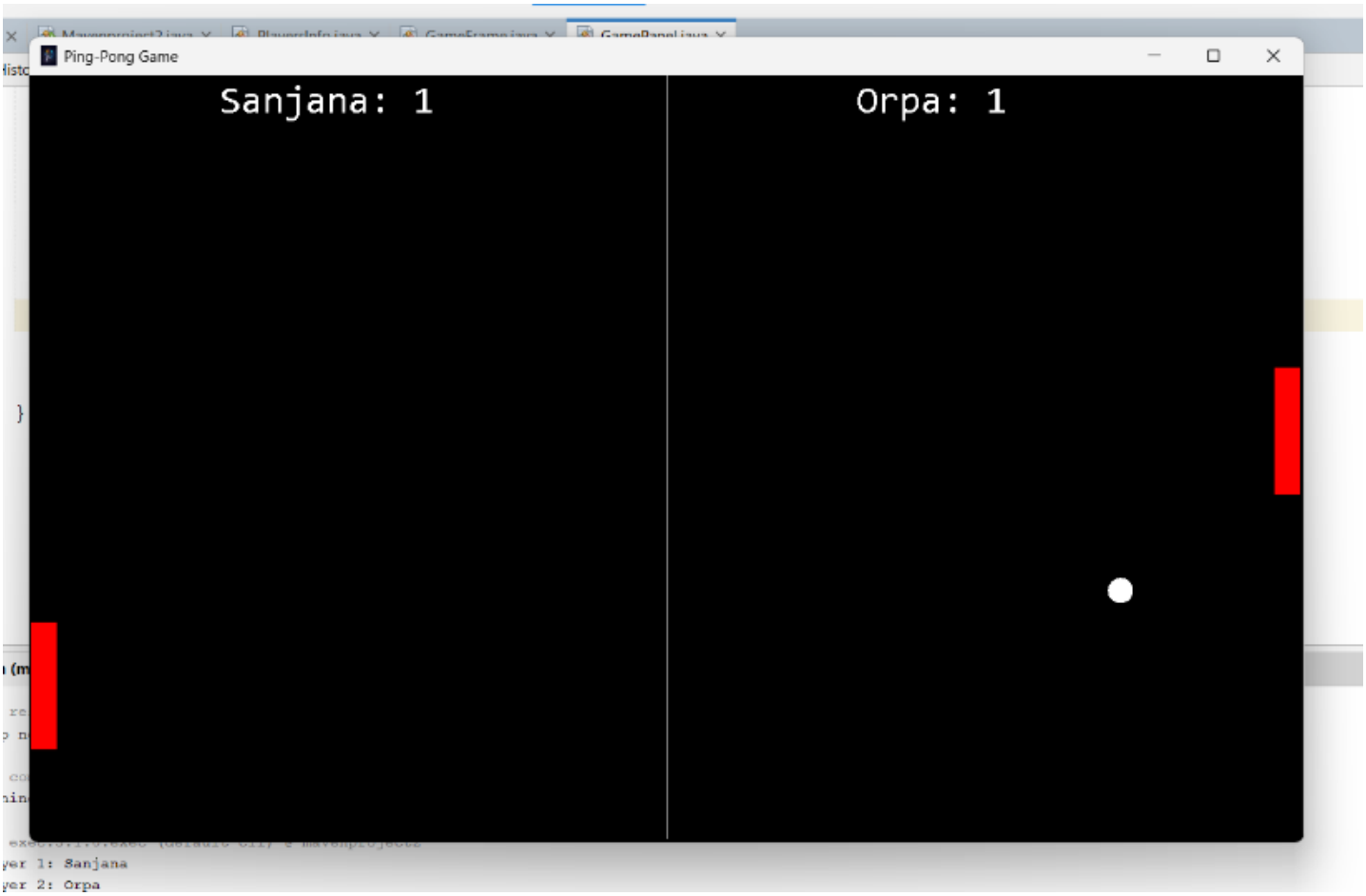
4.Code:

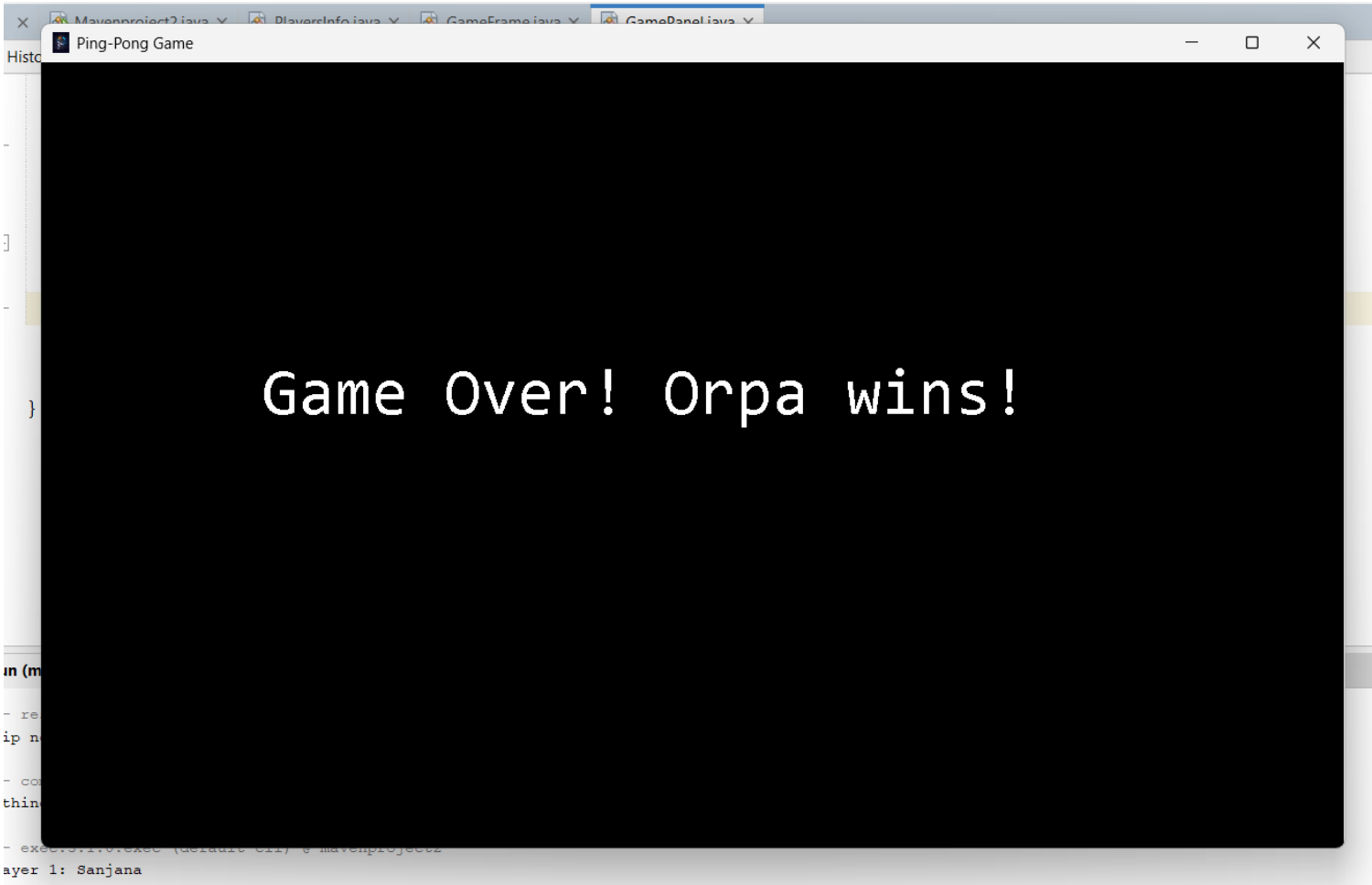
https://github.com/orpa1/Ping_pong_Game.git

5.Output:


Ping-Pong Game
Welcome to Ping-Pong Game!
Player 1 Name:
Player 2 Name:
Input Error
Please enter names for both players.
OK
Submit
Clear


Ping-Pong Game
Welcome to Ping-Pong Game!
Player 1 Name:
Sanjana
Player 2 Name:
Orpa
Submit
Clear


Ping-Pong Game
Sanjana: 1
Orpa: 1
yer 1: Sanjana
yer 2: Orpa


Ping-Pong Game
Game Over! Orpa wins!
ayer 1: Sanjana

6.Discussion:

The Ping-Pong Game designed in this problem demonstrates simple implementation of a two-player Ping-Pong game using Java and Swing. It features a graphical user interface where players can enter their names, and the game window includes two paddles, a ball, and a scoring system. The game allows players to control their paddles using keyboard keys, aiming to hit the ball and score points. The code demonstrates the use of object-oriented programming with classes for player information, game frames, and panels. The graphical interface is visually appealing, with colorful elements and a welcome message. The game includes features such as player input validation, scoring, and a clear interface. Overall, this Ping-Pong game provides an enjoyable and interactive experience for two players, promoting friendly competition.

7.Reference:

[1] "Java Swing Tutorial - javatpoint." https://www.javatpoint.com/java-swing (accessed Jan. 01, 2024).