Flappy Bird Game

PROJECT REPORT

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Introduction

Flappy Bird is a 2D side-scroller game in which the player controls a bird attempting to fly between columns of pipes without hitting them. This project is developed in Java using Swing for GUI and basic game development principles like collision detection, gravity, and user input handling.

Objectives

- To implement a basic 2D game using Java
- To understand game loops, event handling, and UI rendering
- To apply object-oriented programming for better structure
- To allow difficulty level selection and display scoring

Tools and Technologies

- Programming Language: Java
- GUI Framework: Java Swing
- IDE: NetBeans 25
- Image Assets: PNG files for bird, background, pipes

Game Design

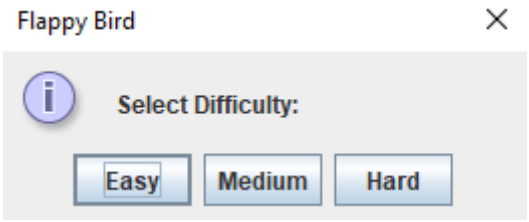
The game starts with a splash screen where the player selects a difficulty. The bird automatically falls due to gravity and the player can press SPACE to make it jump. Pipes move from right to left and the player must navigate the bird through the gaps. The score increases as the bird passes through pipes. The game ends on collision.

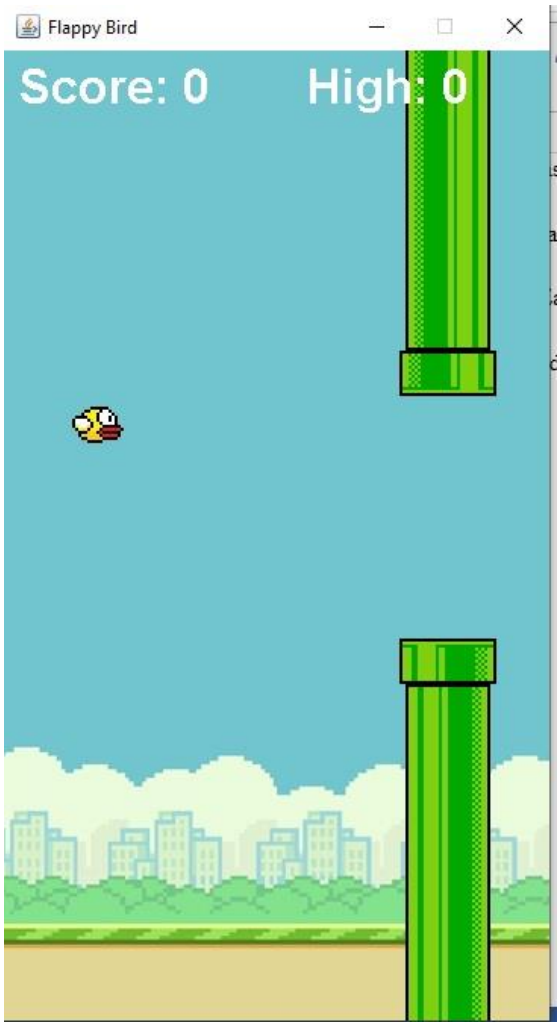
Code Overview

Key Components:

- FlappyBird.java: Main game class extending JPanel and implementing KeyListener and ActionListener.
- Bird and Pipe classes: Represent game entities with position, dimensions, and behavior.
- Game loop: Timer running at 60 FPS to update game state and redraw components.
- Difficulty selection: Uses JOptionPane to allow players to choose Easy, Medium, or Hard.
- Collision Detection: Checks intersection between bird and pipes to detect game over.

Program Output (Screenshots)





Learning Outcomes

- Improved understanding of Java Swing and GUI design
- Experience with real-time game development
- Practical use of object-oriented programming
- Enhanced debugging and logic-building skills

Conclusion

The Flappy Bird project offered hands-on experience in creating an interactive desktop game. We implemented various programming concepts like game loops, event handling, collision detection, and graphics rendering. It was a challenging yet rewarding project that helped us better understand Java development beyond standard applications.