Project Description:

The Offline Games Collection is a desktop-based gaming platform designed to deliver a variety of classic game experiences without requiring an internet connection. Built using Java and JavaFX for the frontend, the application offers multiple games within a single system. Users can access a main menu to choose from several offline games and enjoy seamless gameplay with interactive visual feedback.

Games included:

- **Tic Tac Toe**
- **2048 Game**
- **Sudoku Solver**
- **Flappy Bird**
- **Snake Game**
- **Hangman Game**
- **Minesweeper**
- **Memory Match**
- **Brick Breaker**
- **Racing Car**
- **Ping Pong Ball**
- **Tower of Hanoi**
- **Bean Machine**
- **NCS**

Dependencies and Technologies Used:

- **Frontend:**
  JavaFX for controls, FXML, swing, media
  Scene Builder for GUI design
- **Build Tool:**
  Maven for dependency management and build automation

Source of Dependencies:

Dependencies were sourced from the Maven Central Repository:

- JavaFX and related libraries: Maven Central.
- The pom.xml file was configured in IntelliJ IDEA or NetBeans or Eclipse to manage Java dependencies.

Installation of Dependencies:

Frontend (JavaFX)

1. Install JDK (Java Development Kit)
2. Choose an IDE
3. Create a New JavaFX Project
4. Add JavaFX Libraries (if needed)
5. Create a Main Application Class
6. Build the Scene
7. Create the Scene Graph
8. Set the Stage
9. Add Event Handlers
10. Run Your Application
11. Iterate and Refine

How Users Can Use the Application:

1. **Launch the Application:** Open the application to access the homepage displaying a welcome message.
2. **Select a Game:** Choose from available games (Tic Tac Toe, Snake, Number Guessing, Memory Matching).
3. **Play the Game:** Each game has unique controls and instructions displayed on the screen. Complete the game objectives and view your results or scores.
4. **Return to Menu:** After finishing a game, users can return to the main menu to select another game or exit.

Purpose of the Project:

The Offline Games Collection serves as a recreational tool, enabling users to enjoy classic games without requiring an internet connection. It provides a fun, lightweight platform for entertainment while demonstrating skills in Java, GUI design, and object oriented programming.

Target Audience:

- **Students**: To relax and entertain between study sessions.
- **Programmers**: As a practical demonstration of JavaFX-based application development.
- **Casual Gamers**: To enjoy classic offline games on desktop systems.

Benefits of This Project:

1. **Offline Accessibility:**
   - ✓ Users can play games without requiring an internet connection, making it suitable for regions with poor or unstable connectivity.
2. **Stress Relief and Entertainment:**
   - ✓ The project provides users with a variety of games to relieve stress and pass leisure time.
3. **Skill Development:**
   - ✓ Certain games, such as Sudoku Solver and Tower of Hanoi, help users enhance problem-solving and logical reasoning skills.
4. **Engagement and Competition:**
   - ✓ The leaderboard feature fosters healthy competition and motivates users to improve their scores.
5. **Educational Value:**
   - ✓ Games like Number Conversion System and Hangman serve an educational purpose while entertaining users.
6. **Sharpens Cognitive Skills:**
   - ✓ The Minesweeper game sharpens users' brain knowledge by improving strategic thinking and problem-solving abilities.
7. **Memory Enhancement:**
   - ✓ The Memory Match game enhances users' memory retention and recall skills through engaging gameplay.
8. **Multiplayer Functionality:**
   - ✓ The inclusion of multiplayer modes, such as "Player vs Player" in Tic Tac Toe, adds social interaction and fun to the gaming experience.
9. **Customization and Variety:**
   - ✓ Users can choose from a collection of games with varying levels of difficulty, ensuring engagement for all age groups.

How to Use the Features:

- ➢ **Main Menu:**
  - Navigate through the main menu to select a game.
  - Start the selected game and follow on-screen instructions.
- ➢ **Gameplay:**
  - Play each game based on its rules and objectives.
  - Return to the main menu after completion.

Technologies Used in This Project:

Feature/Concept	Description
☕ **Java**	Core programming language used for logic and application development.
🎨 **JavaFX**	Framework for building rich graphical user interfaces.
🎨 **CSS**	Used for styling the user interface (application.css).
🖥️ **Eclipse IDE**	Development environment suggested by .classpath, .project, and .settings files.
🗂️ **File I/O**	File handling for data storage (users.txt, leaderboard.txt).
🖼️ **Resource Management**	Use of images and resources (background.png, ic_apple.png).
🛠️ **OOP**	Evident from modular structures, classes, and inheritance.
🔗 **Modular Programming**	Use of module-info.java to define module dependencies.
🎮 **Game Development**	Includes logic for games like FlappyBird, SnakeGame, Minesweeper, etc.
🌀 **Game Physics/Animations**	For interactive games (e.g., FlappyBird, RacingCar3).
💾 **Data Serialization**	Likely used for saving and retrieving game state (e.g., UserManager).
🔒 **Access Control**	Managing user data and game logic securely (User, UserManager).
🧮 **Algorithm Design**	Algorithms for games like SudokuSolver, TowerOfHanoi, and 2048.
🎛️ **Event Handling**	For user interactions within games.
🎨 **Custom Graphics**	Customizing visual elements in the games.

Motivation for Building the Project:

This project aimed to create a comprehensive offline gaming experience, liberating users from the constraints of internet connectivity and providing access to a diverse collection of beloved classic games anytime, anywhere.

Beyond mere recreation, the project served as a hands-on learning opportunity to deepen understanding of object-oriented design principles, explore the capabilities of the JavaFX framework, and refine skills in building robust and user-friendly desktop applications.

The unified platform sought to present these timeless games in a modern and intuitive interface, ensuring accessibility for a broad audience while preserving the essence of their original gameplay.

The project also investigated efficient resource management and optimized performance techniques, ensuring smooth and responsive gameplay even on systems with limited processing power, thereby maximizing accessibility for a wider user base.