A Report on GAME HACKATHON 2024
Titled
"GameGen: Conquer Algorithmic Challenges in Gaming using Java"

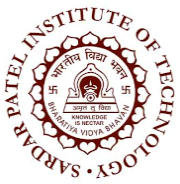
Report Made by

Maqsad
Shoyab Sidhique 2023510055
Nidhi Walavalkar 2023510064
Ankita Shejal 2023510052
Aditi Thakore 2023510057

FYMCA Sem-II
Academic Year: 2023-24
ISE-2 (DAA and JAVA)

Under the Guidance of

Dr. Aarti Karande
Prof. Sakina Salmani



Master of Computer Applications Program
Computer Science and Engineering Department
Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
Munshi Nagar, Andheri (W), Mumbai – 400 058.
(Autonomous Institute Affiliated to University of Mumbai)

Date: 16th April 2024

Group Member Description along with Latest Photo

Group member Name	Description of the person (Tell about yourself which best describes you as a person and as professional)
Shoyab Sidhique	I'm a collaborative and helpful individual, both personally and professionally. Focused and driven, I thrive in a team environment and believe in motivating those around me.
Nidhi Walavalkar	I am Nidhi Walavalkar, driven by an unyielding desire to learn and a steadfast commitment to my goals. Personally, I thrive on exploration and growth, while professionally, I approach challenges with a focused determination, always striving for success.
Ankita Shejal	I am Ankita Shejal, motivated by a passion for learning and a strong sense of purpose in achieving my goals. Whether in my personal pursuits or professional endeavors, I thrive on completing tasks efficiently and with dedication, driven by a goal-oriented mindset.
Aditi Thakore	I am Aditi Thakore, passionate about exploring new things and always pushing myself to be better.On a personal level, I find immense satisfaction in the journey of discovery and self-improvement.

Group Name: Maqsad

Table of Contents

Description of Game and Motivation

Description:
Our application is a captivating multilevel adventure game developed in JavaFX and FXGL. Players embark on a strategic journey, navigating through levels filled with unique obstacles and puzzles. The twist lies in the requirement to clear adjacent levels to progress, adding a layer of strategic thinking. By leveraging Java's object-oriented programming features and algorithmic concepts, players apply their problem-solving skills to overcome challenges, devise optimal strategies, and execute plans effectively.

Motivation:
This app provides an immersive gaming experience that motivates players to explore algorithmic concepts and Java programming principles in a fun and engaging manner. Through its intricate level design and strategic gameplay, players are encouraged to think critically, analyze situations, and apply algorithmic techniques to solve puzzles. By mastering each level's challenges, players not only advance through the game but also gain a deeper understanding of data structures, dynamic programming, and other algorithmic topics covered. Ultimately, it fosters computational thinking and programming proficiency, empowering players to conquer algorithmic challenges both in the game and in real-world scenarios

Tools used (Both frontend and Backend):

This app leverages the powerful combination of JavaFX and FXGL to create a seamless and immersive gaming experience. JavaFX provides a robust framework for building rich user interfaces, allowing us to create visually stunning graphics and intuitive controls for players. FXGL, on the other hand, extends JavaFX with game-specific functionalities, enabling us to easily handle game logic, physics, and entity management.

In our project, JavaFX and FXGL work together harmoniously to bring our game to life. We utilize JavaFX for creating the user interface elements such as buttons, labels, and layout containers, ensuring a polished and responsive UI design. FXGL, with its game engine capabilities, handles the core aspects of our game, including collision detection, entity movement, and level management.

Detailed Innovation description:

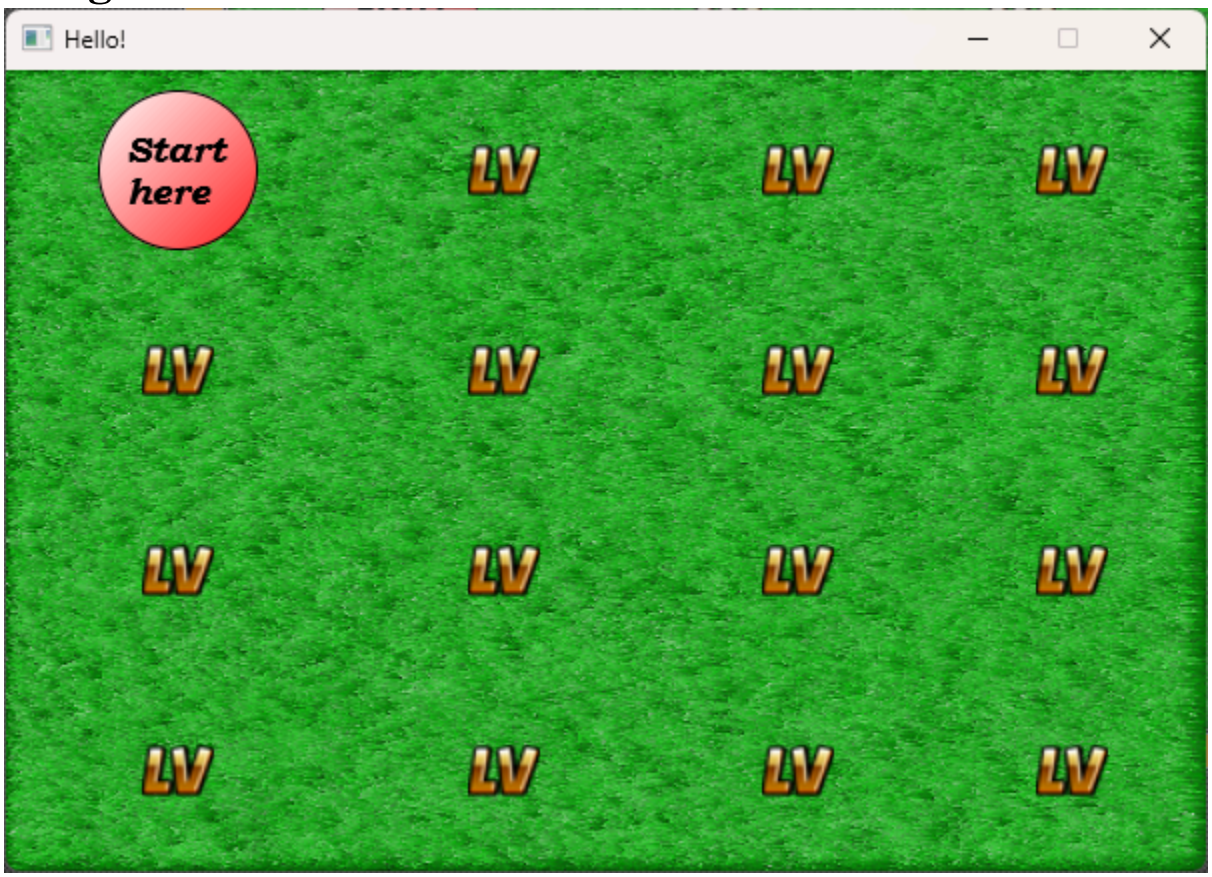
Our innovative project, crafted with JavaFX and FXGL, delivers an immersive gaming adventure that seamlessly blends algorithmic concepts with Java programming principles. At its core, our game relies on Data Structures and Algorithms (DSA) to shape gameplay mechanics and present captivating challenges to players. Leveraging Java's robust object-oriented features, we've built a dynamic gaming environment where players embark on multilevel adventures filled with diverse obstacles and puzzles. The foundation of our game rests upon the meticulous integration of JavaFX and FXGL technologies. JavaFX empowers us to create visually stunning graphics and intuitive user interfaces, enhancing the overall player experience. Meanwhile, FXGL extends JavaFX specifically for game development, providing specialized functionalities such as physics simulations, entity management, and level design.

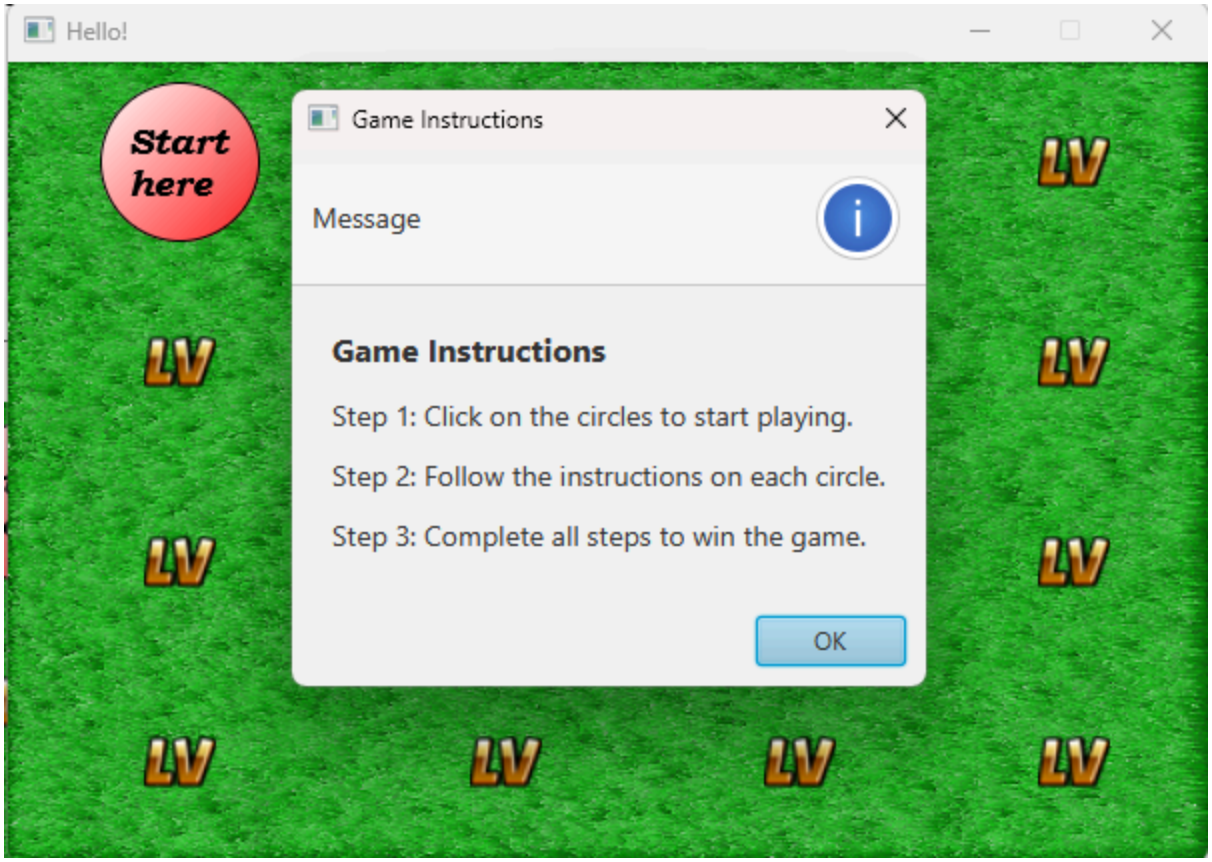
Throughout the development journey, we've deeply incorporated DSA concepts to drive the core mechanics of the game. Whether it's navigating through graph-based paths or optimizing strategies using dynamic programming techniques, players are constantly engaged with algorithmic challenges that both entertain and educate. Java's adaptability as a programming language has been instrumental in bringing our project to life. With Java, we've seamlessly implemented complex algorithms for puzzle-solving and efficiently managed game state transitions and user interactions. Its object-oriented paradigm allows us to encapsulate game entities, define their behaviors, and ensure seamless interactions within the game environment.

In practice, our project harmoniously combines JavaFX's UI components with FXGL's game engine functionalities. JavaFX handles the creation of UI elements such as buttons, labels, and layout containers, ensuring a polished and responsive user interface. Meanwhile, FXGL manages core game mechanics like collision detection, entity movement, and level progression, delivering a smooth and captivating gaming experience.Through the meticulous fusion of JavaFX, FXGL, and DSA concepts, our project epitomizes innovation in gaming technology. By intertwining algorithmic challenges with Java programming expertise, we've created an engaging

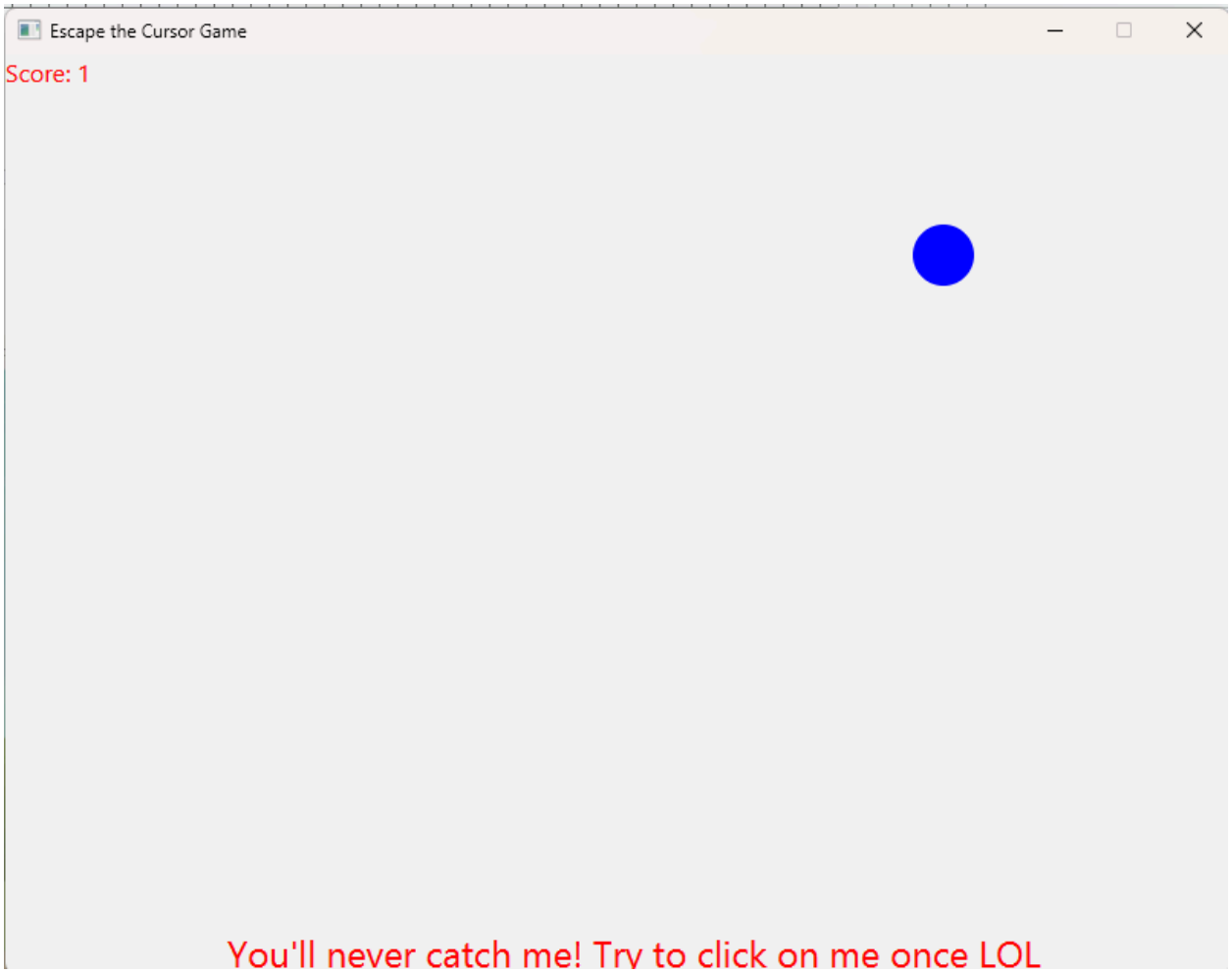
platform that not only entertains but also nurtures players' computational thinking skills. Our project signifies a pioneering approach to game development, where technology and education converge to offer a truly immersive and enlightening gaming experience.

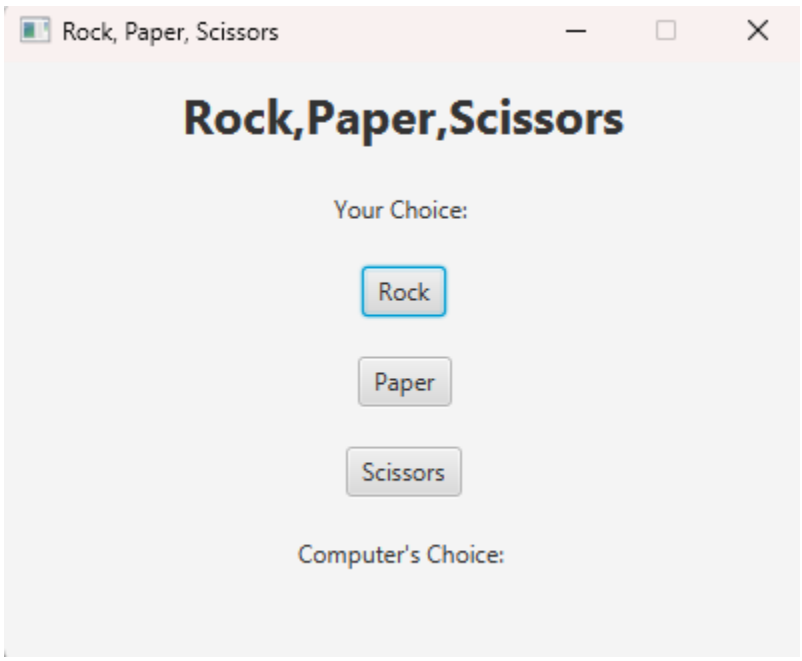
Images:

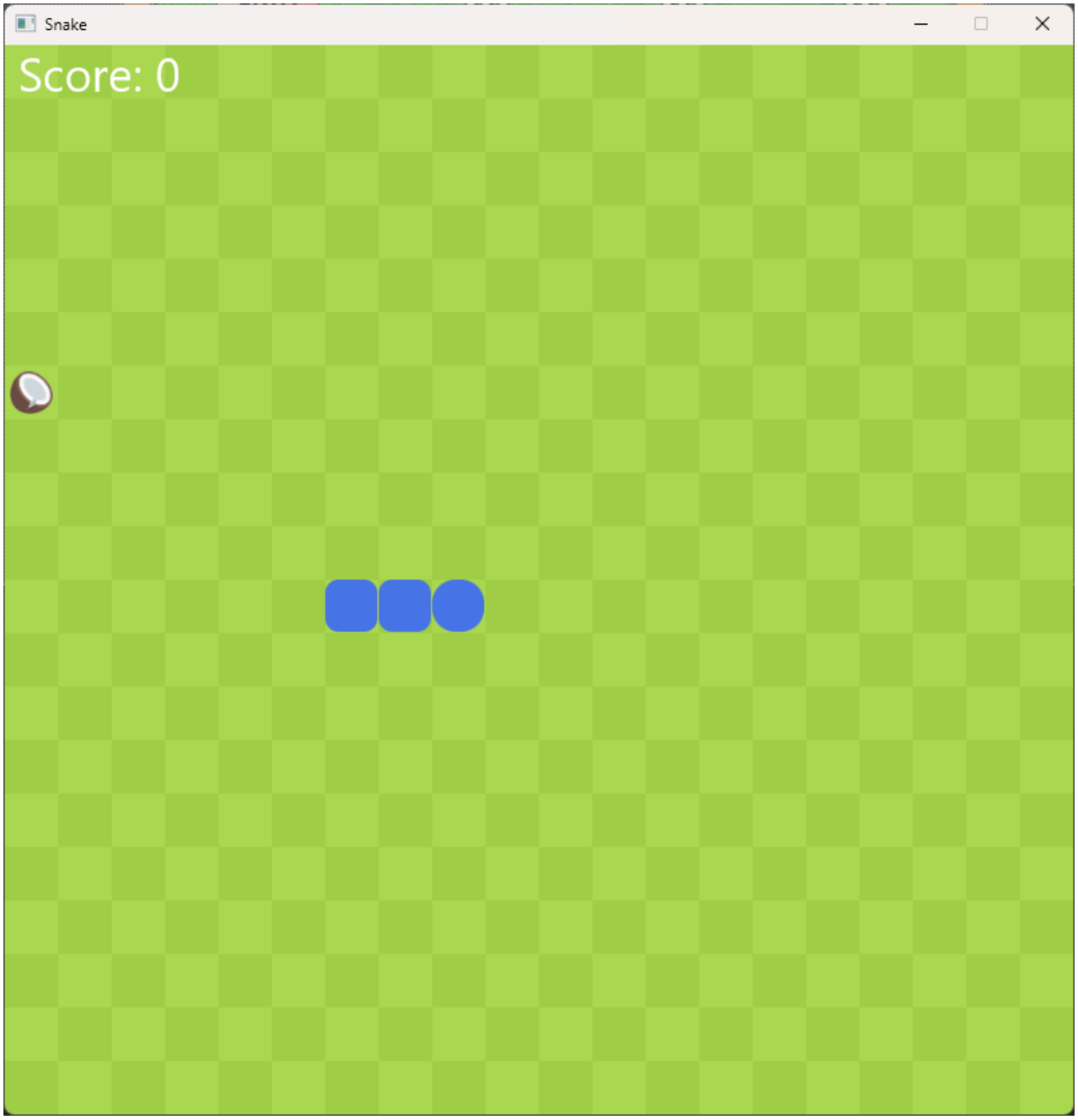


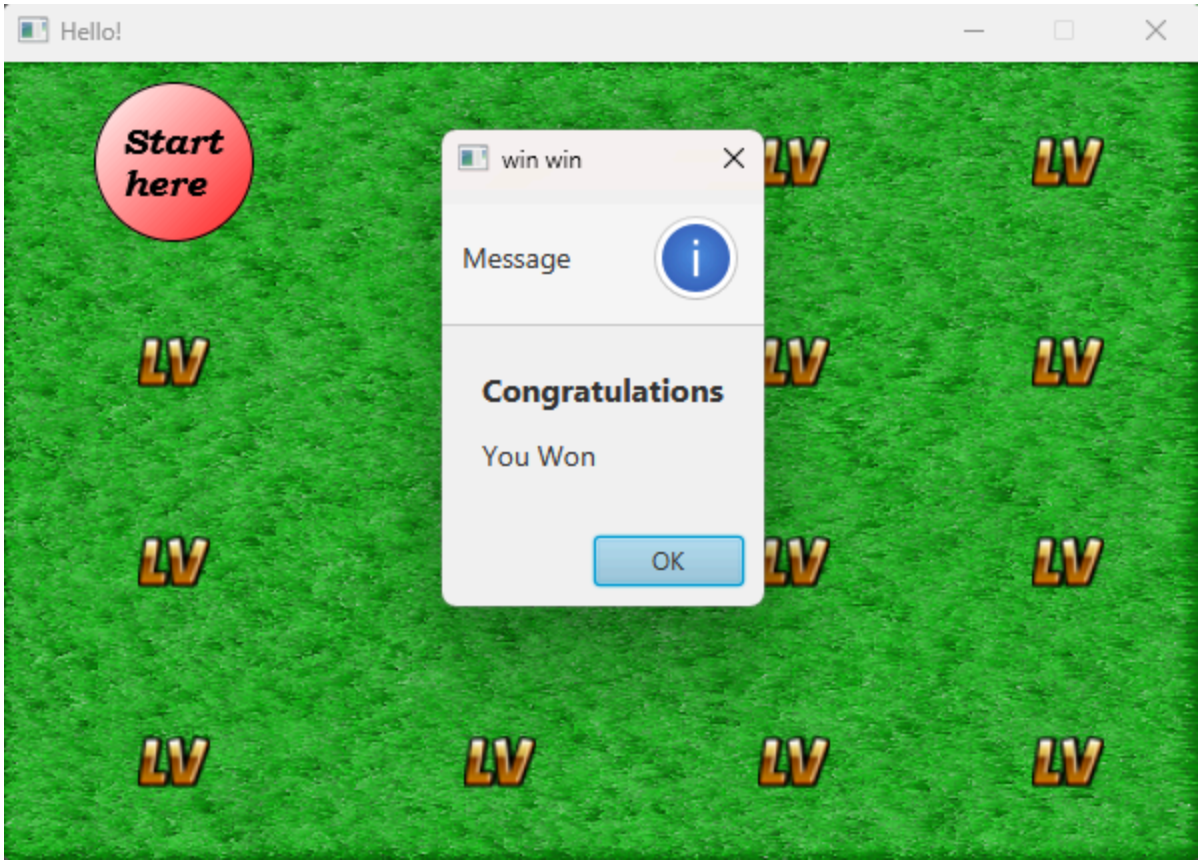

Hello!
Start here
Game Instructions
Message
Game Instructions
Step 1: Click on the circles to start playing.
Step 2: Follow the instructions on each circle.
Step 3: Complete all steps to win the game.
OK


Click the Button Game
Score: 5
Click Me!


Escape the Cursor Game
Score: 1
You'll never catch me! Try to click on me once LOL


Rock, Paper, Scissors
Rock,Paper,Scissors
Your Choice:
Rock
Paper
Scissors
Computer's Choice:


Snake
Score: 0


Hello!
Start here
win win
Message
Congratulations
You Won
OK

References:

1. https://almasb.github.io/FXGL/
2. https://javadoc.io/doc/com.github.almasb/fxgl/0.5.4/index.html
3. https://youtu.be/DxGS7haJkX8?si=CcNtKaNB3QOPjIAZ
4. https://youtu.be/DxGS7haJkX8?si=CcNtKaNB3QOPjIAZ
5. https://youtu.be/BRMpJZ5QhY4?si=NMkeiYLAxOfgVM8S
6. https://youtu.be/H9WjCyPFOug?si=RkFWYtgxj83JftqT