

CMPT276 - PHASE 4 REPORT – GROUP 9

1. Game

1.1 Description

CityEscapeGame is a thrilling 2D Java game where players take on the role of a thief navigating a bustling metropolitan city while evading pursuing cops. Players must collect diamonds and nitro boosts, avoid hurdles like spikes and potholes, and use their skills to escape before time runs out. The game challenges players with strategic planning, quick reflexes, and a balancing act between collecting rewards and avoiding obstacles.

1.2 Original Plan vs. Final Product

Original Plan:

- Design a 2D game where a thief collects rewards and evades obstacles and cops.
- Include a time limit and penalties to enhance challenge and excitement.
- Implement a map with varying hurdles, rewards, and patrol routes for cops.

Final Product:

- The main gameplay and mechanics align with the original plan, providing an engaging and strategic game.
- Features like diamond collection, nitro boosts, and specific penalties for hurdles were implemented as intended, ensuring balanced gameplay.
- Slight changes to cop behavior or map designs were made based on challenges or optimizations observed during testing to improve overall gameplay experience.

Justifications for Changes:

- Optimized Cop AI difficulty based on test playing observations to ensure a more balanced and engaging challenge for players.
- Streamlined UI transitions to improve performance and enhance user experience by reducing delays and ensuring smooth visual transitions.

1.3 Modifications

The following changes were made to enhance the game during this phase:

- **Refactored Code:** Improved game logic readability and maintainability by modularizing methods and reducing redundant code.
- **Enhanced Gameplay Features:** Finalized diamond and nitro reward mechanics to ensure a balanced challenge, where collecting nitro boosts extends the player's time, and collecting diamonds offers key progress markers.
- **Improved Hurdle Behavior:** Fine-tuned the effects of potholes and spikes for consistent and fair gameplay, ensuring players could avoid these obstacles in a challenging yet achievable way.
- **UI Adjustments:** Streamlined transitions between screens (e.g., Main Screen to Game Screen) to improve performance and enhance the overall user experience, reducing potential lag and making the flow smoother.

1.4 Challenges Faced and Lessons Learned

Challenges:

- Balancing the difficulty of cop AI with player skills to create an engaging experience without making the game too easy or too difficult.
- Debugging issues related to reward collection, hurdle interactions, and cop behaviors, ensuring they all functioned as expected.
- Ensuring the game remained visually appealing and engaging within the constraints of Java's 2D libraries, requiring optimization of graphics and UI transitions.
- Maintaining effective team collaboration and task division to meet deadlines and ensure a high-quality final product.
- Streamlining UI transitions while maintaining performance and usability, ensuring smooth navigation between screens without compromising gameplay experience.
- Creating a responsive UI to ensure smooth navigation within Java's 2D constraints.

Lessons Learned:

- The importance of clear communication and version control in team projects, which helped avoid issues during code integration.
 - The value of thorough testing to ensure a seamless player experience, which allowed the team to identify bugs and improve the game's balance.
 - Techniques for optimizing 2D game performance, including adjusting AI complexity and simplifying graphics to ensure smooth gameplay.
 - Optimized UI design by focusing on minimizing unnecessary elements, which enhanced both the game's performance and user experience across different devices.
 - Learned the value of iterative development and clear workflows to ensure smooth front-end and back-end integration, reducing debugging challenges.
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2. Tutorial

2.1 How to Play

Game Rules:

- You have 5 minutes to finish the game, or you lose.
- Collect all diamonds to complete the game.
- Collecting a nitro reward increases your remaining time by 1 minute.
- Hitting a pothole ends the game immediately.
- Hitting a spike decreases your time to finish by 1 minute.
- If caught by two cops, the game ends instantly.

Controls:

- Use the arrow keys to navigate the thief across the city map.

2.2 Video Demo

A detailed tutorial/demo of the game is available in the video linked below:

[Watch the Tutorial Video](#)