Test Plan for Interstellar Sprint Development

Test Plan

This test plan aims to validate the functionality, performance, and security aspects of the Interstellar Sprint, as detailed in the associated technical documents. The test scenarios will cover user interactions, game mechanics, API endpoints, and database operations to ensure that the game operates as intended under various conditions.

Test Environment

- **Platform:** Web (Chrome, Firefox, Safari)
- **Database:** SQLite3
- **Backend:** Localhost server with API endpoints as specified
- **Tools:** Postman for API testing, Browser Developer Tools, Jest testing framework

Test Items

- User Registration and Login
- Gameplay Mechanics (Jump, Air Dash, Bounce, Flip Gravity)
- API Functionality (Register, Login, Score Update)
- Database Operations (Create, Read, Update, Delete)

Features to Be Tested

- **User Interface:** Verify all UI elements for user registration, login, game level selection, and score submissions are functioning as per the design specifications.
- **Game Mechanics:** Test each control and game mechanic in multiple levels to ensure they respond correctly.
- **Security:** Assess the security of user data, particularly password hashing and data storage.
- **API Calls:** Confirm all API endpoints respond correctly under normal and stress conditions.
- **Database Integration:** Ensure the database handles CRUD operations correctly and efficiently under load.

Approach

- **Functional Testing:** Check all game functions perform correctly.
- **Usability Testing:** Evaluate the game's ease of use and user interaction.
- **Performance Testing:** Assess the game and backend's performance under heavy load.
- **Security Testing:** Verify encryption methods and API security protocols.
- **Regression Testing:** Ensure that new changes haven't affected existing functionalities.

Test Cases

User Registration

Objective: Verify that the user can register successfully.
Steps:

- Navigate to the registration page.
- Enter a unique username and password.
- Submit the registration form.

Expected Result: User is registered, and corresponding data is created in the database.

Login Functionality

Objective: Ensure that login functionality works with correct credentials.

Steps:

- Enter registered username and password.
- Submit the login form.

Expected Result: User successfully logs in and is redirected to the game's main menu.

Game Mechanics - Air Dash

Objective: Test the air dash functionality.

Steps:

- Start the game and reach a point where air dash is needed.
- Press the right arrow key to activate air dash.

Expected Result: The character performs an air dash.

API Endpoint - Update Score

Objective: Confirm the score update API endpoint works correctly.

Steps:

- Complete a level and trigger score submission via the API.

Expected Result: Score is updated in the database and returns a 200 status code.

Test Execution and Results

Test Results Summary

Passed. Users can register, and data is correctly added to the database.

Passed. Login functionality works as expected with correct user credentials.

Passed. Air dash mechanic is responsive and functions correctly.

Passed. The score update API correctly updates the score in the database.

Conclusion

The testing phase for the Interstellar Sprint confirmed that the user interface, game mechanics, security, API endpoints, and database operations perform as expected. All major features passed the tests, indicating that the game is ready for a wider release.