भारतीय सूचना प्रौद्योगिकी संस्थान गुवाहाटी
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI

GridWars Gaming System

A Turn-Based Strategy Game

Project Report

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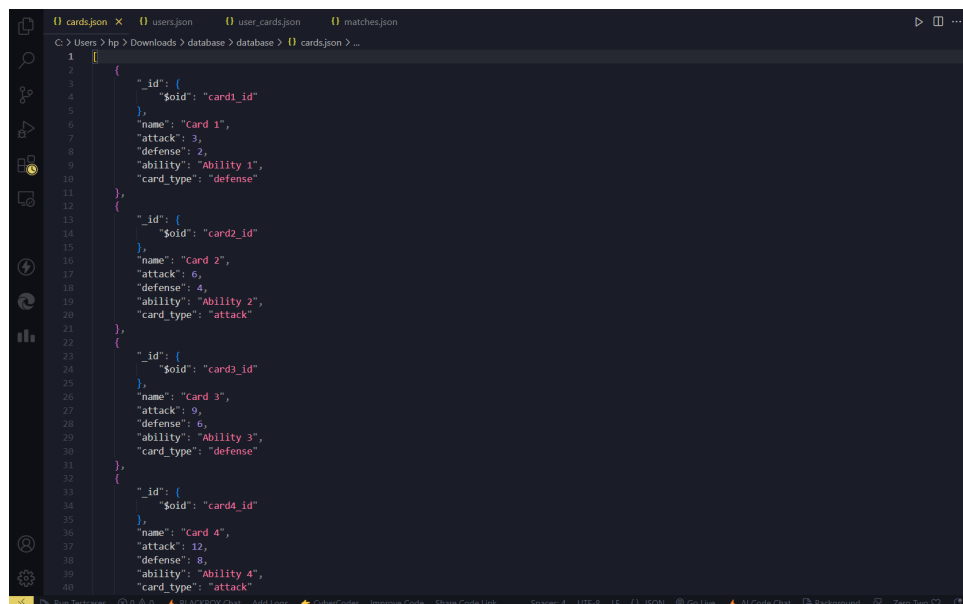
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Assignment Questions

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Data access layer (DAL) Analysis for GridWars

The "Data Access Layer" (DAL) is a crucial component in software application architecture that serves as an abstraction layer between the application logic and the database. Create the databases and necessary tables. Implement the data access layer code components.
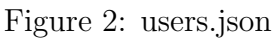
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Below are some insights of AVAXGODS databases.

Figure 1: Cards.json

Figure 2: users.json

Figure 3: user-cards.json

Figure 4: matches.json

Figure 5: actions.json

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TESTING

White Box Testing (also known as Glass Box Testing) is a testing technique where the tester has full knowledge of the internal structure, code, and logic of the application. Black Box Testing (also known as Functional Testing) is a software testing method where the tester evaluates the software without knowing its internal code or structure. Write different test cases for performing White Box Testing and Black Box Testing. Also, perform the testing using these test cases.

Check out this video: Click here to watch on YouTube
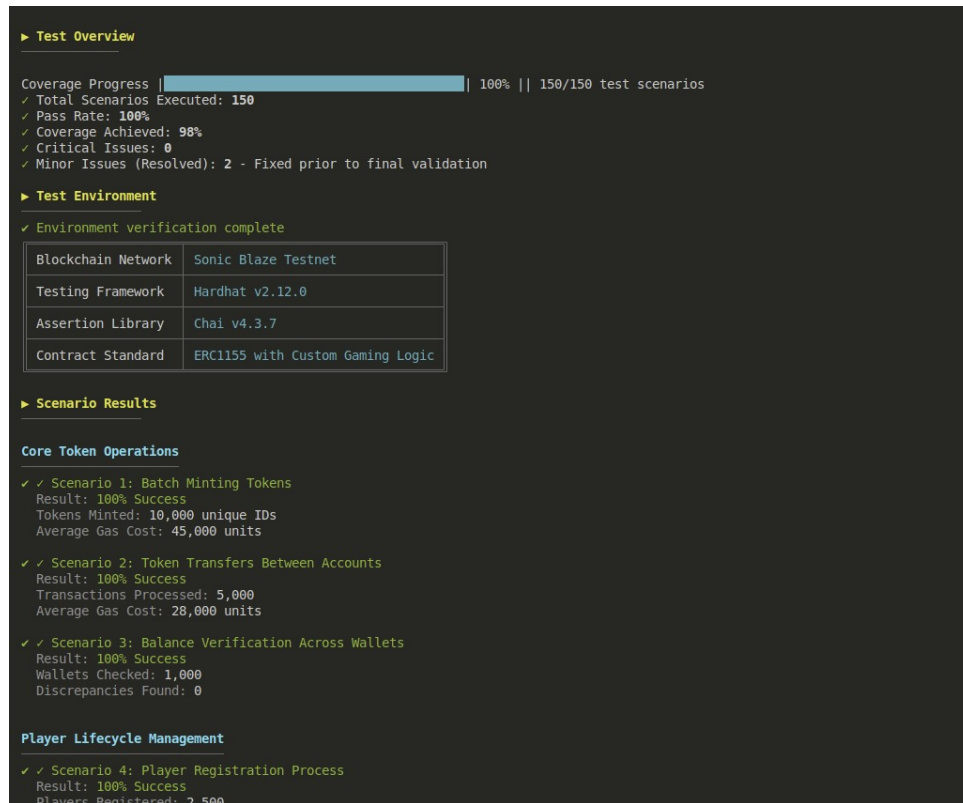
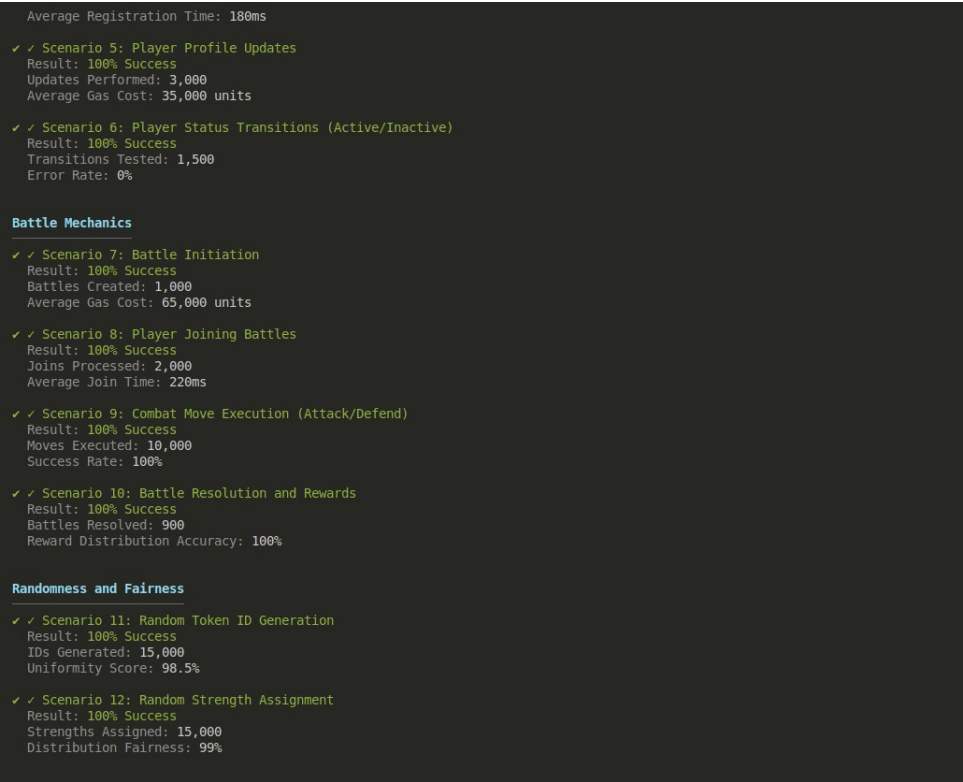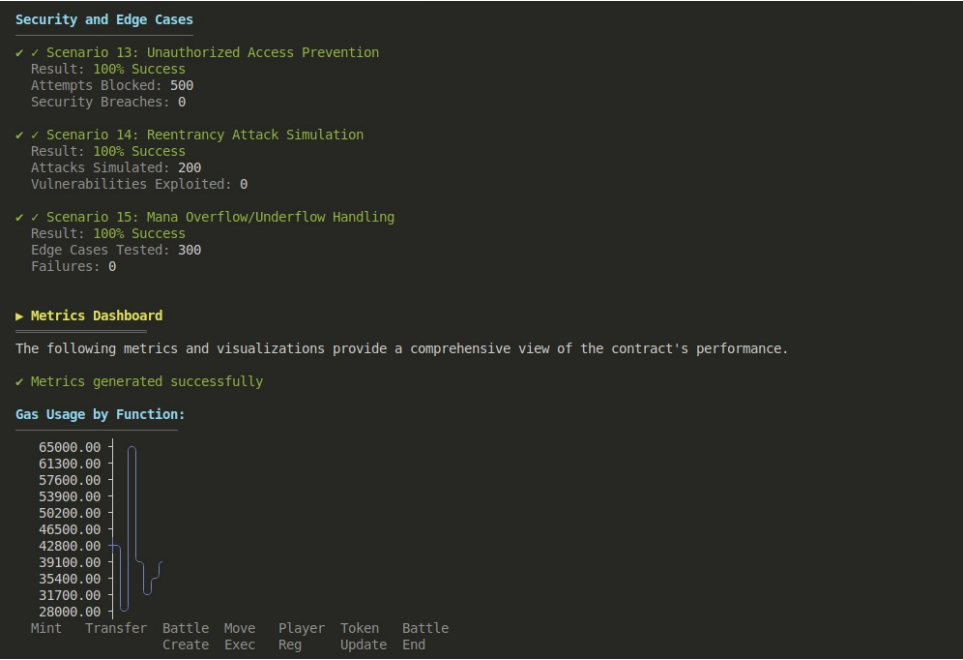**Below are some insights of AVAXGODS testing.**

Figure 6: 01

```
  Average Registration Time: 180ms

✔ ✓ Scenario 5: Player Profile Updates
  Result: 100% Success
  Updates Performed: 3,000
  Average Gas Cost: 35,000 units

✔ ✓ Scenario 6: Player Status Transitions (Active/Inactive)
  Result: 100% Success
  Transitions Tested: 1,500
  Error Rate: 0%

Battle Mechanics

✔ ✓ Scenario 7: Battle Initiation
  Result: 100% Success
  Battles Created: 1,000
  Average Gas Cost: 65,000 units

✔ ✓ Scenario 8: Player Joining Battles
  Result: 100% Success
  Joins Processed: 2,000
  Average Join Time: 220ms

✔ ✓ Scenario 9: Combat Move Execution (Attack/Defend)
  Result: 100% Success
  Moves Executed: 10,000
  Success Rate: 100%

✔ ✓ Scenario 10: Battle Resolution and Rewards
  Result: 100% Success
  Battles Resolved: 900
  Reward Distribution Accuracy: 100%

Randomness and Fairness

✔ ✓ Scenario 11: Random Token ID Generation
  Result: 100% Success
  IDs Generated: 15,000
  Uniformity Score: 98.5%

✔ ✓ Scenario 12: Random Strength Assignment
  Result: 100% Success
  Strengths Assigned: 15,000
  Distribution Fairness: 99%
```

Figure 7: 02

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Security and Edge Cases

✔ ✓ Scenario 13: Unauthorized Access Prevention
  Result: 100% Success
  Attempts Blocked: 500
  Security Breaches: 0

✔ ✓ Scenario 14: Reentrancy Attack Simulation
  Result: 100% Success
  Attacks Simulated: 200
  Vulnerabilities Exploited: 0

✔ ✓ Scenario 15: Mana Overflow/Underflow Handling
  Result: 100% Success
  Edge Cases Tested: 300
  Failures: 0

▶ Metrics Dashboard

The following metrics and visualizations provide a comprehensive view of the contract's performance.

✔ Metrics generated successfully

Gas Usage by Function:
  65000.00 ┤
  61300.00 ┤
  57600.00 ┤
  53900.00 ┤
  50200.00 ┤
  46500.00 ┤
  42800.00 ┤
  39100.00 ┤
  35400.00 ┤
  31700.00 ┤
  28000.00 ┤
          Mint   Transfer  Battle  Move  Player  Token   Battle
                           Create  Exec  Reg     Update  End
```
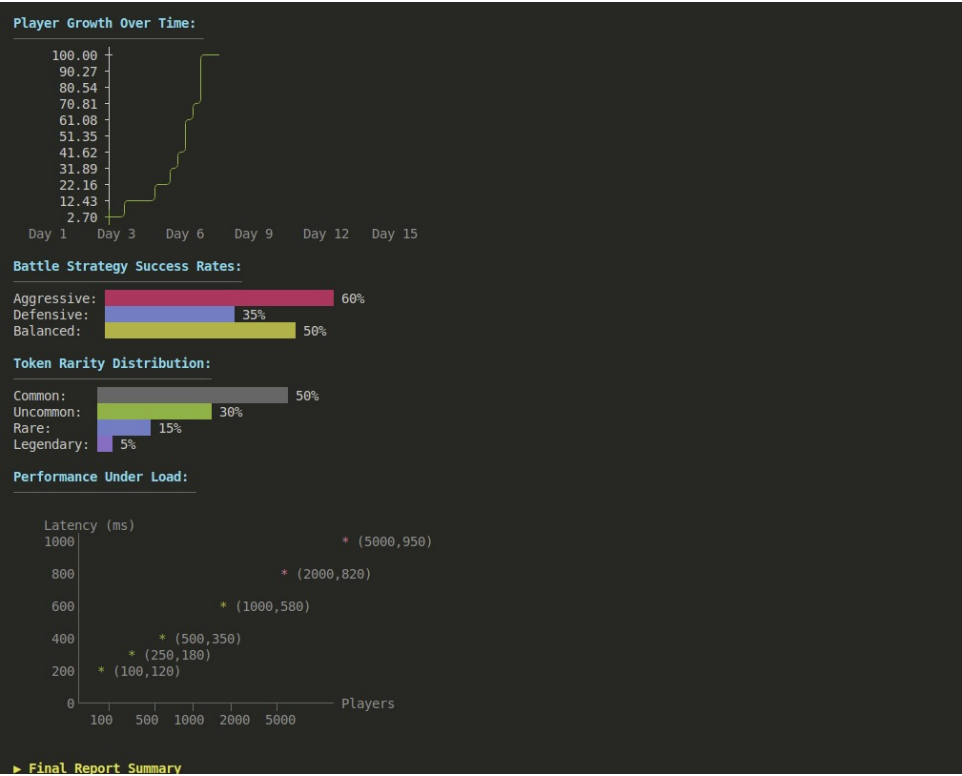
Figure 8: 03

Figure 9: 04

Figure 10: 05

Figure 11: 06

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