

Functional & Performance Testing Template

Model Performance Test

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| Date | 08 February 2026 |
| Team ID | LTVIP2026TMIDS83745 |
| Project Name | Intelligent SQL Querying with LLMs Using Gemini Pro |
| Maximum Marks | 4 Marks |

Test Scenarios & Results

| Test Case ID | Scenario (What to test) | Test Steps (How to test) | Expected Result | Actual Result | Pass/Fail |
|--------------|------------------------------------|--|--|---|-----------|
| FT-01 | Text Input Validation | Enter valid and invalid natural language queries | Valid text accepted, empty input rejected with error message | Valid queries processed, empty input shows warning | Pass |
| FT-02 | SQL Injection Prevention | Enter malicious input (e.g., DROP TABLE) | System prevents unsafe execution | Unsafe queries blocked, error shown | Pass |
| FT-03 | Natural Language to SQL Generation | Enter sample queries (SELECT, WHERE, GROUP BY, JOIN) | Correct SQL query generated | 92% accurate SQL generation | Pass |
| FT-04 | API Connection Check | Verify Gemini API key and send test request | API responds successfully | API responded within 2 seconds | Pass |
| FT-05 | Query Execution | Execute generated SQL on SQLite database | Correct data returned | Results displayed correctly in tabular format | Pass |
| PT-01 | Response Time Test | Measure time for query generation | Response < 5 seconds | Average response time = 2.8 seconds | Pass |
| PT-02 | Concurrent API Calls | Send multiple queries simultaneously (5-10 requests) | System handles requests without crash | 10 requests handled in ~12 seconds (~1.2 sec/query) | Pass |

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|--------------|--------------------------|--|---------------------------------------|--|-----------|
| PT-03 | Load Test | Execute multiple complex JOIN queries continuously | System remains stable | No crashes, minor delay on large queries | Pass |
| PT-04 | Error Handling Stability | Trigger invalid SQL generation | System shows meaningful error message | User-friendly error message displayed | Pass |

Performance Observations

- Simple SELECT queries → 100% success
- Aggregation queries → 95% accuracy
- JOIN queries → 88-92% accuracy
- Average response time → 2.8 seconds
- No system crash during testing

Security Testing Results

- SQL injection attempts blocked
- API key secured via environment variables
- Invalid query execution prevented
- Error messages do not expose sensitive system data