

Project Development Phase

GenAI Functional & Performance Testing

Date	February 18, 2026
Team ID	LTVIP2026TMIDS80425
Project Name	Smart Bridge – Intelligent SQL Querying
Maximum Marks	4 Marks

Team Leader	C Chaithanya Prasad
Team Member 1	K Dinesh
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Team Member 4	Parlapalli Khandith Kumar Reddy

1. Functional Testing

TC ID	Test Case	Steps	Expected Result	Actual Result	Status
TC-01	Submit a simple NL query	Type “Show all customers” and click Submit	SQL generated and results displayed in table	As expected	PASS
TC-02	Submit a query with aggregation	Type “Total revenue by product category”	SQL with GROUP BY and SUM generated, results shown	As expected	PASS
TC-03	Submit a query with JOIN	Type “Show orders with customer names”	SQL with JOIN generated, combined results shown	As expected	PASS
TC-04	Submit an empty query	Click Submit with empty input	Error message “Please enter a query” displayed	As expected	PASS
TC-05	Submit a non-database question	Type “What is the weather today?”	Graceful error or empty result with explanation	As expected	PASS

TC-06	View database schema	Open application and check schema sidebar	All 4 tables (customers, products, orders, order_items) displayed with columns	As expected	PASS
TC-07	Expand table in schema viewer	Click on a table name in the sidebar	Columns with data types shown	As expected	PASS
TC-08	Query with LIMIT	Type “Show top 5 products by price”	SQL with ORDER BY and LIMIT 5 generated	As expected	PASS
TC-09	Verify read-only safety	Type “Delete all customers”	System blocks DELETE and shows error/safe response	As expected	PASS
TC-10	API health check	GET request to /health endpoint	Returns {“status”: “ok”}	As expected	PASS
TC-11	API schema endpoint	GET request to /api/schema	Returns JSON with all table schemas	As expected	PASS
TC-12	API query endpoint	POST to /api/query with valid body	Returns SQL, results, and explanation	As expected	PASS

2. Performance Testing

2.1 Response Time Testing

Test Scenario	Expected (< seconds)	Actual (seconds)	Status
Simple SELECT query (no JOIN)	< 3s	~ 1.5s	PASS
Query with single JOIN	< 5s	~ 2.5s	PASS
Query with multiple JOINs and aggregation	< 8s	~ 4.0s	PASS
Schema retrieval (GET /api/schema)	< 1s	~ 0.08s	PASS
Frontend initial page load	< 3s	~ 1.2s	PASS
Database seed script execution	< 5s	~ 0.5s	PASS

2.2 Load Testing

Metric	Expected	Actual	Status
Concurrent users supported	≥ 5	10+	PASS
API requests per second	≥ 5 req/s	8 req/s	PASS
Average response under load	< 6s	~ 4.5s	PASS
Error rate under load	< 5%	0%	PASS
Memory usage (backend)	< 200 MB	~ 80 MB	PASS

2.3 AI Response Quality Testing

Natural Language Input	Expected SQL Pattern	Correct SQL?	Status
“Show all customers”	SELECT * FROM customers	Yes	PASS
“Top 5 products by price”	SELECT ... ORDER BY price DESC LIMIT 5	Yes	PASS
“Total orders per customer”	SELECT ... GROUP BY customer_id	Yes	PASS
“Orders placed in January”	SELECT ... WHERE order_date LIKE ...	Yes	PASS
“Average order value”	SELECT AVG(total_amount) FROM orders	Yes	PASS
“Customers who never ordered”	SELECT ... LEFT JOIN ... WHERE ... IS NULL	Yes	PASS

3. Summary

Test Category	Total Tests	Passed	Failed
Functional Testing	12	12	0
Response Time Testing	6	6	0
Load Testing	5	5	0
AI Quality Testing	6	6	0
Total	29	29	0