Project Development Phase
Model Performance Test

Date	10 February 2025
Team ID	LTVIP2025TMID36237
Project Name	Sustainable smart city assistant using IBM GRANTIE LLM
Maximum Marks	

Model Performance Testing:

📊 Model Performance Testing Template for Smart City Assistant

S.No.	Parameter	Screenshot / Values
1	**Data Rendered**	*e.g.*, source: traffic sensor logs, air quality feeds, waste pickup records. Include screenshot of loaded raw data table or map.
2	**Data Preprocessing**	*e.g.*, applied steps—missing value imputation, normalization, geospatial coordinate transformation. Include screenshot of code or preview.
3	**Utilization of Data Filters**	*e.g.*, date range filters, pollutant threshold filters, zone selection dropdowns. Screenshot of filtered dashboard view.
4	**DAX Queries Used**	*e.g.*, SUM('Energy'[Usage]), CALCULATE() measures for peak demand. Provide screenshots of formula editor and results.
5	**Dashboard Design**	**No. of Visualizations / Graphs** – ___ *e.g.*, 5 visuals: line chart (energy), bar chart (waste bins status), map, KPI cards, gauge.
6	**Report Design**	**No. of Visualizations / Graphs** – ___ *e.g.*, 4 visuals: monthly summary, emissions trend, citizen request types pie chart, alert table.

💡 Smart City's Context with IBM Granite LLM

1. **Data Rendered**
   - Inputs: real-time IoT feeds (e.g. traffic, waste, energy), historical population/environment data.
   - Use IBM Granite Geospatial models (e.g. *Granite-EarthObservation*, *WeatherClimate*) to process satellite or environmental time-series data ibm.com+5ibm.com+5newsroom.ibm.com+5ibm.com.
2. **Data Preprocessing**
   - Geospatial coordinate normalization, DAX-based unit conversions, timestamp alignment for sensors; doc data prepared for RAG pipelines.
3. **Utilization of Data Filters**
   - User interface allows filtering by ward, date/time, pollutant level.
   - Filters feed into Granite-backed queries to generate dynamic insights or alerts.
4. **DAX Queries Used**
   - Examples:

        - TotalEnergy = SUM(Energy[Consumption_kWh])
        - AvgPM25 = AVERAGE(AirQuality[PM2_5])
        - EnergyPerCapita = DIVIDE(TotalEnergy, Population[Count])
5. **Dashboard Design**
    - Visual layout combining energy usage trends, real-time pollution map overlays, resource utilization gauges, and KPI summary cards.
    - Leverages Granite's RAG capability to embed contextual explanations alongside visuals ibm.com+1developer.nvidia.com+1.
6. **Report Design**
    - Executive summaries: automated pages with charts (e.g., monthly emissions, citizen requests classified by urgency).
    - Granite generates text narratives explaining visuals, powered by instruction-tuned 3.0–3.2 models reddit.com+10reddit.com+10ibm.com+10.
