**Project Development Phase**

**Model Performance Test**

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| Date | 10 February 2025 |
| Team ID | LTVIP2025TMID34374 |
| 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** – \_\_\_<br>*e.g.*, 5 visuals: line chart (energy), bar chart (waste bins status), map, KPI cards, gauge. |
| 6 | **Report Design** | **No. of Visualizations / Graphs** – \_\_\_<br>*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+5](https://www.ibm.com/architectures/product-guides/granite?utm_source=chatgpt.com)[ibm.com](https://www.ibm.com/granite?utm_source=chatgpt.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](https://www.ibm.com/granite?utm_source=chatgpt.com).
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](https://www.reddit.com/r/machinelearningnews/comments/1j19l70?utm_source=chatgpt.com).