**🌆 Smart City Project – Solution Requirements**

**📅 Date:** 31 January 2025  
**🧑‍💻 Team ID:** **LTVIP2025TMID37298**  
**📘 Project Name:** Sustainable Smart City Assistant Using IBM Granite LLM  
**🏆 Maximum Marks:** 4 Marks

**✅ Functional Requirements**

| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| --- | --- | --- |
| FR-1 | **User Registration** | - Registration via Form - Registration via Gmail - Registration via LinkedIn |
| FR-2 | **User Confirmation** | - Email Verification - OTP Verification |
| FR-3 | **Smart Query Handling** | - Users can input questions about water, traffic, waste, energy - System routes query to appropriate LLM pipeline |
| FR-4 | **AI Assistant Interaction** | - Real-time response via chat UI - Voice-based queries using STT |
| FR-5 | **Data Insights Dashboard** | - Display smart city data (waste mgmt, energy usage, etc.) - Charts and analytics using APIs / ML models |
| FR-6 | **Location-based Services** | - Weather data retrieval using IBM Weather API - Alerts for energy/water issues in user's area |
| FR-7 | **Feedback and Reporting** | - User can give feedback on system - Admin panel for issue tracking |

**🔒 Non-Functional Requirements**

| **NFR No.** |  |  |  | **Non-Functional Requirement** | **Description** |
| --- | --- | --- | --- | --- | --- |
| NFR-1 |  |  |  | **Usability** | UI must be simple, responsive, and accessible on mobile/web. User onboarding should be intuitive. |
| NFR-2 |  |  |  | **Security** | Secure user data using encryption (SHA-256), JWT for session management, and OAuth for social login. |
| NFR-3 |  |  |  | **Reliability** | The system should handle failure gracefully, auto-retry requests, and use error logging (e.g., Sentry). |
| NFR-4 |  |  |  | **Performance** | Fast response time (under 1s), real-time updates, optimized LLM inference using caching. |
| NFR-5 |  |  |  | **Availability** | 24/7 system uptime using load balancers, IBM Cloud redundancy. |
| NFR-6 |  |  |  | **Scalability** | Easily support growing users using containerized architecture (Docker + Kubernetes or IBM Cloud Foundry). |