Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	27 June, 2025
Team ID	LTVIP2025TMID29210
Project Name	Health AI : Intelligent HealthCare Assistant Using IBM Granite
Maximum Marks	4 Marks

Technical Architecture:
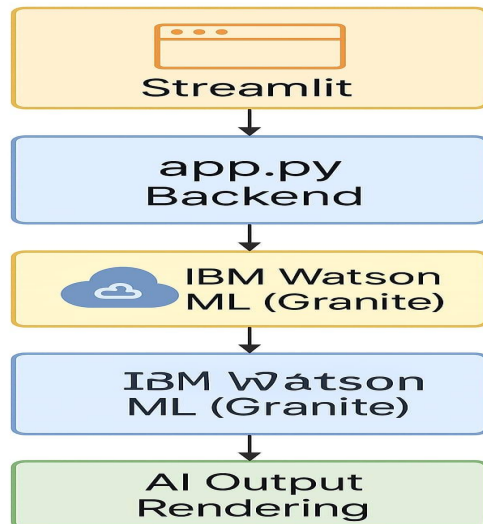
- The Web Interface is developed using Streamlit with Plotly for displaying health data charts.
- The backend is built with Python in the app.py file, handling user inputs and API calls.
- The AI responses for chat, disease prediction, and treatment plans come from IBM Granite LLM using IBM Watson ML API.
- API keys and sensitive information are stored securely using dotenv in a .env file.
- The application is deployed on Streamlit Cloud with environment variable support.

Guidelines:

Include all the processes (As an application logic / Technology Block)
Provide infrastructural demarcation (Local / Cloud)
Indicate external interfaces (third party API's etc.)
Indicate Data Storage components / services
Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI for patients (Chat, Disease Prediction, Treatment Plans, Health Analytics)	Streamlit, Custom CSS, Plotly
2.	Application Logic-1	Handle user inputs (Symptoms, Queries, Profile data)	Python (Streamlit app.py)
3.	Application Logic-2	Build prompts and handle API calls to IBM Granite	IBM Watson ML API (Granite LLM)
4.	Application Logic-3	Process AI responses for each module	Python Backend Logic
5.	Health Data Visualization	Display patient metrics & trends.	Plotly + Streamlit UI Widgets.
6.	Secure API Key Management	Store and load IBM API credentials securely	dotenv + Streamlit Secrets
7.	Cloud Hosting	Deployment and public access	Streamlit Cloud
8.	External API-1	Connect to IBM Watson ML for AI Responses	IBM Watson Machine Learning API
9.	Deployment Support	Runtime setup, package dependencies	requirements.txt, Streamlit CLI
10.	Machine Learning Model	Language Model for Chat, Prediction, and Treatment generation	IBM Granite LLM via Watson ML
11.	Infrastructure (Server / Cloud)	Hosting environment for app runtime and API communication	IBM Cloud / Streamlit Cloud.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Libraries & frameworks used for development	Streamlit, Python, Plotly, dotenv
2.	Security Implementations	API key management, data privacy, environment security	HTTPS, dotenv, IBM Watson API Keys, SHA-256 (for any future user data storage security)
3.	Scalable Architecture	Modular, extendable Streamlit app structure with external AI API integration	Streamlit Multipage App, IBM Watson ML APIs
4.	Availability	Deployment on scalable and accessible cloud infrastructure	Replit, Streamlit Cloud
5.	Performance	Fast AI response, API call optimization, minimal UI lag	Streamlit Caching, IBM Watson ML low-latency APIs