**SmartHealth: Project Report**

**Project Title:**

**SmartHealth – AI-Powered Virtual Health Assistant**

**Problem Statement:**

Access to quality healthcare remains a major challenge for people living in rural, remote, and underserved regions. Individuals — including those working in extreme and harsh conditions, such as army personnel and field workers — often face difficulties in accessing immediate medical guidance, early diagnosis, and timely healthcare facilities. These challenges contribute to delayed treatments, preventable complications, and increased health risks. There is a critical need for a solution that ensures early detection, preventive care, and access to essential health resources, regardless of geographical barriers.

**Solution Overview:**

SmartHealth is an AI-driven virtual health assistant designed to bridge the healthcare accessibility gap. It offers an integrated platform where users can:

* Analyze symptoms and receive potential health condition insights.
* Predict diseases such as lung cancer, brain tumors, and diabetes.
* Upload and interpret lab test reports.
* Diagnose medical images like X-rays, MRIs, and scans.
* Get personalized lifestyle, diet, and wellness recommendations powered by Gemini API.
* Access first-aid training videos and guides.
* Find nearby hospitals using real-time location services.

Through intelligent automation, AI-driven responses, user-friendly design, and predictive analytics, SmartHealth empowers individuals to take proactive steps towards better health, especially in remote and challenging environments.

**Technologies Used:**

* **Frontend**: HTML5, CSS3, JavaScript
* **User Interface Framework**: Gradio
* **Backend**: Python (Flask Framework)
* **Machine Learning Libraries**: Scikit-learn, TensorFlow/Keras
* **Computer Vision**: OpenCV
* **AI Integration**: Gemini API
* **Data Handling**: Pandas, NumPy
* **Deployment**: Localhost (development environment)

**Key Features:**

* Symptom-based health assessment.
* Disease prediction for lung cancer, brain tumor, and diabetes.
* AI-powered lab report and image analysis.
* First aid education resources.
* Real-time hospital locator for emergencies.
* Personalized lifestyle and wellness advice.

**Future Scope:**

* Expansion to include mental health support modules.
* Cloud-based large-scale deployment for handling real-time data.
* Advanced cancer prediction models using DNA sequencing technologies.

**Impact:**

SmartHealth aims to democratize healthcare access, support early disease detection, promote preventive healthcare practices, and ultimately save lives, particularly in resource-limited and harsh environments.

**Team Details:**

* **Team Name**: SigmaCoders
* **Team Members**: Nadukula Hemanth, Akash Pandit, Kshatishka

**Datasets and References:**

* Medical datasets sourced from **Kaggle**, comprising over **6,000+** labeled medical images, including chest X-rays, brain MRIs, and diagnostic data for lung cancer, brain tumors, and diabetes prediction.
* Medical research papers and health informatics sources.

**End of Report**