**Predictive Analysis and Visualization for Healthcare Market Trends**

**⚙️ Installation Guidelines**

This document provides a complete walkthrough for installing and running the production project titled "Predictive Analysis and Visualization of Healthcare Market Trends", covering both data analysis and the full-stack web application developed using Python (ML), MongoDB, React, Tailwind CSS. Typescript, .Json file and etc.

**🔍 Research Steps:**

* Data Collection (CSV, Public Datasets)
* Data Cleaning & EDA
* Feature Engineering
* Model Training & Validation
* Integration with Flask
* Expose APIs to React Frontend

1. **System Requirements:**

* OS: Windows 10/11 / Linux / macOS
* RAM: 8 GB or higher
* Node.js: v18+
* Python: 3.10+ (for ML model training)
* MongoDB: v6+ (locally or MongoDB Atlas)

1. **Tools and technology Used:**

* Jupyter Notebook
* VS code
* Frontend: React.js, Tailwind CSS
* Backend: Express.js, TypeScript, Node.js
* Database: MongoDB
* Authentication: JWT + Admin Approval Flow
* ML Libraries: scikit-learn, pandas, numpy, matplotlib
* Server Hosting (Optional): Render, Vercel, or DigitalOcean
* Version Control: Git + GitHub
* Others: Flask (for ML API), Postman (for testing)

1. **Machine Learning Environment SetUp:**

* Required Libraries:-
* pip install pandas numpy matplotlib seaborn scikit-learn xgboost statsmodels tensorflow keras
* Models Used:
* Linear Regression: for trend forecasting
* Random Forest & XGBoost: for segmentation and prediction
* ARIMA & LSTM: for 10-year time series analysis

1. **Backend Setup:**

* Install dependencies: -
* cd project/src/server
* npm install

1. **Set up environment variables:**

* Create a new .env file:
* MONGO\_URI=mongodb://localhost:27017/healthcare

JWT\_SECRET=yourSecretKey

1. **Start the Server:**

* npm run dev

1. **Frontend Setup**

* Install dependencies: -
* cd project/src/client
* npm install

1. **Start the development Server:**

* npm run dev

After all of this Our WebApp is Setup with all libraries and some frameworks for the development and Presenting the Best way:

1. **MongoDB Setup:**

* Install MongoDB Community Edition
* Run mongo in cmd for check the mongodb is installed or not.

1. **Running the Project:**

* cd project/src/server && npm run dev
* cd project/src/client && npm run dev

1. **PowerBI / Tableau Setup:**

* Import healthcare\_predictions.csv
* Build interactive reports
* Use filters for Year, Disease, Country