PES-PDS\_EDA-Group05\_Project

**NIFTY 50 Stock Market Analysis & Prediction 📊 Project Overview This project involves analyzing historical NIFTY 50 stock market data and predicting daily market movements using machine learning. The project is divided into two parts:**

1. **A Jupyter Notebook (PDS\_PythonProject.ipynb) for data exploration, cleaning, and model building.**
2. **A Streamlit App (app.py) that provides a user-friendly interface for analysis and prediction.**

**📁 Files Included • NIFTY\_50.csv: Historical stock data. • PDS\_PythonProject.ipynb: Notebook with EDA and ML model. • app.py: Basic version of the Streamlit web app. • streamlit\_app\_improved.py: Enhanced version of the Streamlit app. • NIFTY50\_Presentation.pptx: Project presentation.**

**🧪 Jupyter Notebook Highlights (PDS\_PythonProject.ipynb) ✅ Steps Performed: • Data Loading & Cleaning: o Parsed dates o Handled missing values with mean/forward fill (no row drops) • Feature Engineering: o Daily\_Movement: Up (1) or Down (0) based on Close vs Open o Price\_Range, Volatility\_Level • Exploratory Data Analysis: o Summary statistics, trend plots, heatmaps, categorical breakdowns • Model Training: o Random Forest Classifier o Train/Test split with evaluation: Accuracy ~90%, precision, recall**

**🌐 Streamlit App Highlights (streamlit\_app\_improved.py) 🔧 Features: • Upload your own CSV file • Date range selector • Interactive visualizations (price trends, volume, heatmaps) • Live market movement predictor with user inputs 🧠 Behind the Scenes: • The app loads the model trained in the notebook • Accepts user input for new prediction • Displays prediction (Market Up or Down) • Plots trends and statistics for uploaded data**

**👨‍💻 How to Run the App**

1. **Install dependencies: pip install streamlit pandas scikit-learn matplotlib seaborn**
2. **Launch the app: streamlit run streamlit\_app\_improved.py**

**📌 Future Improvements • Use advanced models like XGBoost or LSTM • Time-series forecasting • Integrate real-time stock data using APIs • Add model comparison dashboard in app**

**📬 Contact • GitHub:**[**https://github.com/Prashasti9/PES-PDS\_EDA-Group05\_Project.git**](https://github.com/Prashasti9/PES-PDS_EDA-Group05_Project.git)