Project Domain : Finance

Project Title : **AI-Powered Real-Time Predictive Analytics with Explainability and Scalability.**

Guide : Dr. N. Sunandha

Qualification : Ph. D.

Specialization : AI in Finance

Research Interests: Machine Learning, Real-Time Data Analytics, Explainable AI (LIME, SHAP, CAM), Predictive Modeling, AI Transparency.

Project Description:

Predicting outcomes in high-stakes environments requires systems that are both accurate and interpretable. Traditional AI models often act like "black boxes," providing results without clarity on the reasoning behind them. This lack of transparency makes it difficult for professionals to place full trust in the system, especially when decisions must be made quickly and with confidence.

A solution to this challenge is an AI-powered framework capable of real-time data processing and prediction. By integrating advanced machine learning models with streaming data pipelines, it becomes possible to handle large-scale information while minimizing latency. To further improve trust and usability, explainable AI techniques are incorporated, ensuring that every prediction is supported by clear, understandable insights rather than just a numerical output.

The design emphasizes scalability and adaptability, which allows the framework to be applied across different sectors such as healthcare, cybersecurity, finance, and IoT-driven applications. A well-structured, interactive dashboard delivers the predictions and their explanations in a way that aligns with real-world workflows, making the insights both actionable and easy to interpret.

This approach bridges the gap between raw data and meaningful intelligence, enabling professionals to make faster, more reliable, and more transparent decisions in dynamic environments.

Keywords: Artificial Intelligence, Machine Learning, Real-Time Data Processing, Explainable AI (LIME, SHAP, CAM), Predictive Analytics, Data Streaming, Interactive Dashboards, Big Data, Scalable Architecture, Decision Support Systems.

Future Expansion of the Project: The system can be extended to integrate live data sources for enhanced accuracy and real-time adaptability. Cloud deployment will enable scalability, while automated alerts can ensure timely interventions. Future work may include prescriptive analytics to recommend actions, integration with IoT and edge devices for real-time monitoring, and advanced data privacy measures to strengthen compliance. These enhancements will broaden its applicability across domains, supporting more intelligent, secure, and proactive decision-making.

Requirement for the Project: Python environment with ML libraries (Scikit-learn, TensorFlow, XG Boost), Explainable AI tools (LIME, SHAP, CAM), data streaming platform (Apache Kafka), interactive dashboard framework (Flask/Django/Stream lit), access to domain-specific datasets, secure data handling protocols, and scalable infrastructure for real-time data processing and storage.