1. Introduction:

PeakPredict is a web-based platform that aims to provide users with accurate predictions and insights for financial markets. The platform utilizes artificial intelligence and machine learning algorithms to analyze historical market data and generate predictions for various financial assets. The project focuses on developing a user-friendly interface, secure user authentication and authorization, and a robust backend system to handle data processing and prediction model management.

1. Objectives:

Develop a web application that allows users to access real-time market data, view personalized predictions, and manage their investment portfolios.

Implement secure user authentication and authorization mechanisms to protect user data and ensure privacy.

Integrate machine learning models to generate accurate predictions for different financial assets.

Provide a user-friendly interface for traders to interact with the platform and make informed investment decisions.

Establish a scalable and efficient backend infrastructure to handle data retrieval, storage, and processing.

Scope: 3.1 User Management:

User registration and authentication system with support for ADMINISTRATOR and TRADER roles.

Password strength validation and role-based access control for security.

User profile management and settings configuration.

Integration with a relational database (MySQL) to store user information.

3.2 Portfolio Management:

Allow users to create and manage their investment portfolios.

Support for adding, removing, and updating financial assets within a portfolio.

Display portfolio performance metrics and analytics.

Provide portfolio optimization suggestions based on user preferences and risk tolerance.

3.3 Market Data Integration:

Integrate with reliable financial data providers or APIs to fetch real-time market data.

Support for multiple asset classes, including stocks, cryptocurrencies, and commodities.

Store historical market data in a database for future analysis and model training.

Implement data preprocessing and cleaning techniques to ensure data quality.

3.4 Prediction Models:

Develop machine learning models to generate predictions for different financial assets.

Utilize historical market data and relevant features for model training and validation.

Implement model evaluation and performance metrics to assess prediction accuracy.

Provide a mechanism for updating and retraining models based on new data.

3.5 Frontend User Interface:

Develop an intuitive and responsive web interface using ReactJS.

Implement user authentication and authorization flows for secure access.

Display real-time market data, portfolio information, and prediction results.

Enable users to interact with their portfolios and execute trades.

3.6 Backend Infrastructure:

Design and implement a scalable backend architecture using Spring Boot and Java.

Develop RESTful APIs for communication between frontend and backend components.

Integrate with a relational database (MySQL) for data persistence.

Implement security measures, such as user authentication, authorization, and data encryption.

Ensure high performance and reliability of the backend system.

Deliverables:

Functional web application with user registration, authentication, and role-based access control.

Portfolio management features for users to create, modify, and track their investments.

Integration with real-time market data sources and historical data storage.

Machine learning models for generating financial asset predictions.

User-friendly frontend interface with real-time data visualization and interaction.

Secure and scalable backend infrastructure with RESTful APIs.

Comprehensive documentation, including user guides, API references, and system architecture.

Assumptions and Constraints:

The platform will be developed using ReactJS for the frontend and Spring Boot with Java for the backend.

MySQL will be used as the relational database for data storage.

Integration with external financial data providers or APIs may have usage limitations or costs.

The accuracy of predictions generated by machine learning models may vary and should be used as a supportive tool rather than a sole basis for investment decisions.

The project timeline and resources are subject to the availability of the development team and any external dependencies.

Exclusions:

The platform will not provide direct financial advice or guarantee investment returns.

Integration with external trading platforms or exchanges for executing trades is not within the current scope.

Compliance with specific financial regulations or legal requirements may require additional research and consultation.

Milestone

Requirements gathering and project planning

User authentication and authorization system

Portfolio management module

Real-time market data integration

Machine learning model development and integration

Frontend user interface development

Backend infrastructure development

Integration testing and quality assurance

User acceptance testing and feedback incorporation

Deployment and go-live