For your final year project, creating a stock market predictor using machine learning (ML) is a great choice. To effectively manage your time and delegate responsibilities, I suggest breaking down the project into phases with clear deadlines for each. Here’s a roadmap for your team:

**Phase 1: Planning & Research (October)**

1. **Objective: Lay the groundwork. Research models and datasets.**

2. **Tasks for the Team:**

• **Shayaan (Leader)**: Define project scope, key deliverables, and timeline. Oversee the creation of a detailed project plan.

• **Member 1**: Research stock market trends and sources for reliable data (Yahoo Finance, Alpha Vantage, etc.). Identify relevant features (e.g., stock prices, volume, sentiment).

• **Member 2**: Investigate LSTM (Long Short-Term Memory) and CNN (Convolutional Neural Networks) in time-series forecasting. Compile research on the advantages and limitations of these models.

• **Member 3**: Investigate other potential ML models like ARIMA, XGBoost, or Transformers to benchmark against LSTM and CNN.

• **Whole Team**: Meet to finalize which models you’ll be using based on research.

**Phase 2: Data Collection & Preprocessing (November)**

1. **Objective: Collect historical stock data, clean and preprocess it.**

2. **Tasks for the Team:**

• **Member 1**: Use APIs to collect historical data (daily closing prices, volume, etc.). Create a data pipeline for continuous data updates.

• **Member 2**: Clean the data (handling missing values, normalization, feature scaling). Apply any required transformations (log returns, technical indicators).

• **Member 3**: Conduct exploratory data analysis (EDA) on collected data—visualize trends, correlations, and patterns.

• **Shayaan**: Oversee progress, ensuring all team members align on data quality. Document all preprocessing techniques.

**Phase 3: Model Building (December - Early January)**

1. **Objective: Develop, train, and optimize the predictive models.**

2. **Tasks for the Team:**

• **Shayaan**: Set up a version control system (e.g., GitHub). Lead model selection and ensure the use of proper evaluation metrics (MSE, MAE, RMSE).

• **Member 1**: Build and train the LSTM model using preprocessed data. Tune hyperparameters.

• **Member 2**: Build and train the CNN model. Compare its performance with LSTM.

• **Member 3**: If possible, implement a benchmark model like ARIMA or a simpler ML algorithm (e.g., XGBoost). Conduct performance comparisons.

• **Whole Team**: Regularly review results, discussing challenges with overfitting, performance, or data inconsistencies.

**Phase 4: Evaluation & Tuning (January)**

1. **Objective: Evaluate models, tune them for better accuracy, and finalize the prediction pipeline.**

2. **Tasks for the Team:**

• **Member 1 & Member 2**: Evaluate models on test data using the selected metrics. Fine-tune hyperparameters for improved results.

• **Member 3**: Perform error analysis. Identify reasons behind poor performance (e.g., outliers, insufficient data, overfitting).

• **Shayaan**: Supervise the comparison of models and performance metrics. Ensure reproducibility of results (set random seeds, etc.).

**Phase 5: Integration & UI Development (Late January)**

1. **Objective: Integrate models into a functional system with a user interface.**

2. **Tasks for the Team:**

• **Member 1**: Develop a basic front-end (if needed) to display stock predictions to users (using Flask, Streamlit, or a simple web dashboard).

• **Member 2**: Set up the back-end for the ML models and prediction pipelines.

• **Member 3**: Develop a system to pull real-time stock data and make predictions live.

• **Shayaan**: Oversee integration, ensuring the models are working correctly in the final system. Test for bugs or glitches.

**Phase 6: Documentation & Final Presentation (February)**

1. **Objective: Prepare the final report and presentation for submission.**

2. **Tasks for the Team:**

• **Member 1**: Write the introduction and methodology section for the final report.

• **Member 2**: Write about the models, training process, and results. Include charts, graphs, and performance evaluations.

• **Member 3**: Create diagrams (model architectures, workflows) and document data preprocessing.

• **Shayaan**: Compile and finalize the full report. Lead preparation for the final presentation and demo. Ensure all deliverables are completed and submitted on time.

**Additional Tips:**

• **Weekly meetings**: Have a team meeting each week to track progress and resolve roadblocks.

• **Time management**: Reserve time in January for unexpected delays or fine-tuning.

• **Version control**: Use GitHub for code collaboration and track changes efficiently.

• **Collaboration tools**: Use Google Drive or Notion for documentation sharing and task tracking.

This roadmap gives everyone clear tasks while keeping the project on track.