# Stock Return Prediction: Objective and Responsibilities

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## Objective

The objective of this experiment is to compare the performance of three machine learning models—Linear Regression, Random Forest, and Support Vector Machine—in predicting stock returns using historical financial data, specifically Cash Flow, Book Value, and Earnings. The goal is to provide valuable insights into the potential applications and limitations of machine learning in finance, benefiting investors and traders in making more informed decisions in the complex and volatile world of financial markets.

## Responsibilities

As the sole contributor to this paper, I will be responsible for the following tasks:

1. **Data Collection and Preprocessing:** Collecting historical financial data for a sample of stocks, including Cash Flow, Book Value, and Earnings. Performing data cleaning and preprocessing tasks to ensure the data is suitable for analysis. The data will be collected from the AlphaVantage API and will be collected into an appropriate format to be fed through the experiment.
2. **Feature Engineering and Data Normalization:** Transforming the raw data into features that better represent the underlying problem and scaling the features to a standard range. Ensuring that all features have equal importance and that the models do not give more weight to features with larger magnitudes.
3. **Model Training and Hyperparameter Tuning:** Training each model using the prepared data and tuning the hyperparameters to maximize performance. Ensuring that the models are optimized for the prediction task and selecting the best model based on the results.
4. **Model Evaluation and Analysis:** Evaluating the performance of each model using the testing set and k-fold cross-validation to ensure their robustness and generalizability. Providing an in-depth analysis of the results and offering insights into the strengths and weaknesses of each model.
5. **Paper Writing and Editing:** Organizing the content, writing, and editing the paper to ensure it is well-structured, coherent, and professionally presented. Finally, ensuring that the findings are accurately represented and that the paper meets the requirements.

As the sole contributor to this project, my responsibilities encompass all aspects of the paper. I will perform data collection and preprocessing, feature engineering, model training and hyperparameter tuning, model evaluation and analysis, and paper writing and editing. This comprehensive approach will allow me to have a deep understanding of the models' performance and their implications for the financial domain, resulting in a well-structured and insightful paper.