**Class Project: Analyzing the Impact of Insider Trades on Stock Performance**

**Objective**: In this project, students will investigate the correlation and potential causation between insider trading activity and stock price movements. Using data from SEC EDGAR and other sources, students will analyze how insider trades (purchases or sales of company stock by executives, board members, or other insiders) affect the stock performance over time. The goal is to develop a system or framework that helps retail investors better understand the relationship between these insider trades and stock price movements.

**Project Breakdown**:

1. **Problem Definition**:
   * Explain how insider trades may influence stock prices and market sentiment.
   * Define the hypothesis: "Insider trades can impact the stock price direction in the short term (up or down)."
   * Discuss the key factors that may interact with insider trades (e.g., company performance, economic conditions, sector behavior).
2. **Data Collection**:
   * **SEC EDGAR Database**: Obtain insider trade reports (Form 4 filings) for specific companies.
   * **Stock Price Data**: Use financial data APIs or websites to pull historical stock prices for the corresponding companies (Yahoo Finance, Google Finance, etc.).
   * **Other Sources**: Optionally, use other market data, sector performance, and news related to insider trades for additional context.
3. **Data Cleaning and Preprocessing**:
   * Extract relevant data points: dates of insider trades, type of trade (buy/sell), quantity, price, etc.
   * Align trade dates with historical stock prices.
   * Preprocess and clean the data to create time-series datasets showing stock price changes around trade dates.
4. **Correlation and Causation Analysis**:
   * Use statistical methods (correlation analysis, regression models, etc.) to find relationships between insider trades and stock price changes.
   * Analyze the time lag between the trade and significant price movement.
   * Investigate if other factors (market conditions, sector trends) may confound the insider trade impact.
5. **Developing a System or Tool**:
   * Create a prototype system (using Python, R, or other tools) that tracks insider trades and provides insight into potential stock price impacts.
   * The system should allow users to input a stock ticker and visualize insider trades alongside stock price movements over time.
   * Incorporate machine learning models to predict potential stock price trends based on insider trading activity.
6. **Reporting Findings**:
   * Present results in a report and/or visual presentation.
   * Discuss any observed trends or patterns.
   * Evaluate the predictive value of insider trades on stock performance.

**Expected Outcome**:

* A deeper understanding of the relationship between insider trades and stock price performance.
* Development of a basic tool to help retail investors make informed decisions based on insider trading activity.

**Tools**: Python (Pandas, Matplotlib, Scikit-learn), R, Jupyter Notebooks, or other data analysis tools.