Crystal Ball Analysis: Projecting Share Prices Of The Leading GPU Titans

AN INDUSTRY ORIENTED MINI REPORT

Submitted to

JAWAHARLAL NEHRU TECNOLOGICAL UNIVERSITY, HYDERABAD

In partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

Submitted By

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CERTIFICATE OF COMPLETION
INDUSTRY ORIENTED MINI PROJECT

This is to certify that the UG Project Phase-1 entitled "Crystall Ball Analysis: Projecting Share Prices Of The Leading GPU Titans" is being submitted by SALLA SRI CHAITHANYA (21UK1A05F7) GEETHA PABBOJU(21UK1A05H7) HARSHITH DIDDI (21UK1A05J5) in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science & Engineering to Jawaharlal Nehru Technological University Hyderabad during the academic year 2023- 2024.

Project Guide

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ABSTRACT

Predicting share prices of technology giants, particularly in the GPU sector, is a complex task due to the rapid pace of innovation and market volatility. This study employs Crystall Ball Analysis, a sophisticated predictive modeling technique, to forecast future share prices of leading GPU manufacturers. By integrating historical stock data, market trends, and advanced statistical algorithms, the analysis aims to provide reliable insights into potential future price movements.

The methodology involves gathering and analyzing extensive datasets spanning financial metrics, industry news, and macroeconomic factors influencing the GPU market. Through rigorous statistical modeling and scenario analysis, Crystall Ball Analysis identifies key variables impacting share prices and quantifies their influence on future performance.

Case studies of major GPU companies such as NVIDIA, AMD, and Intel's GPU division are examined to illustrate the effectiveness of Crystall Ball Analysis in forecasting stock prices amidst competitive dynamics and technological advancements.

Ultimately, this research contributes to the field of financial forecasting by demonstrating the applicability of Crystall Ball Analysis in enhancing decision-making processes and strategic planning within the volatile technology sector.

TABLE OF CONTENTS:-

1.INTRODUCTION

1.1.OVERVIEW

Crystall Ball Analysis applied to projecting share prices of GPU titans involves leveraging advanced statistical techniques and domain expertise to forecast future stock movements of leading companies in the GPU (Graphics Processing Unit) sector.

This project focuses on predicting the future stock prices of the leading companies in the Graphics Processing Unit (GPU) market. GPUs are essential components for high-performance computing, gaming PCs, and applications like artificial intelligence. Their demand is driven by various factors, making their stock prices dynamic

Crystall Ball Analysis offers a robust framework for projecting share prices of GPU titans by combining data-driven analytics with scenario planning and risk management techniques. It enables stakeholders in the financial and tech industries to navigate uncertainty, optimize investment strategies, and capitalize on opportunities in the dynamic market for graphics processing units.

1.2.PURPOSE

The purpose of Crystall Ball Analysis in projecting share prices of GPU titans, such as NVIDIA, AMD, and Intel's GPU division, revolves around leveraging advanced statistical techniques and comprehensive data analysis to forecast future stock movements accurately. Here's a detailed breakdown of its key purposes:

1. **Enhanced Forecasting Accuracy**:
   - Crystall Ball Analysis aims to improve the accuracy of share price predictions by analyzing extensive historical data and employing sophisticated statistical models.

It considers factors such as past performance, market trends, technological advancements in GPUs, and competitive dynamics to develop robust forecasts.

2. **Risk Assessment and Management**:
    - By conducting thorough risk assessment, Crystall Ball Analysis helps quantify and manage risks associated with investing in GPU stocks. It evaluates factors like market volatility, regulatory changes, macroeconomic conditions, and company-specific risks to provide a comprehensive view of potential uncertainties.
3. **Scenario Planning**:
    - The methodology enables scenario analysis, which involves simulating various future scenarios based on different assumptions and inputs. This helps stakeholders understand how potential changes in market conditions, consumer demand, competitive landscape, or technological innovations could impact GPU titan stock prices.
4. **Strategic Decision Support**:
    - Crystall Ball Analysis provides decision-makers with valuable insights and data-driven recommendations for strategic planning and investment decisions. It facilitates informed choices regarding portfolio management, capital allocation, timing of investments or divestments, and other critical financial strategies.
5. **Adaptability to Market Dynamics**:
    - As the tech industry, particularly the GPU sector, is characterized by rapid innovation and market volatility, Crystall Ball Analysis offers adaptability. It can incorporate new data, adjust models, and update scenarios to reflect emerging trends and developments, ensuring its relevance and effectiveness over time.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

1. **Data Quality and Availability**
    - **Issue**: Many studies note challenges related to the quality and availability of data, especially in obtaining consistent and reliable historical data for GPU manufacturers like NVIDIA, AMD, and Intel's GPU division.
    - **Impact**: Poor data quality can lead to biased forecasts and inaccurate predictions, undermining the reliability and usefulness of Crystall Ball Analysis in stock price projections (Chen et al., 2019).
2. **Model Complexity and Assumptions**
    - **Issue**: The complexity of statistical models used in Crystall Ball Analysis, such as time series models and regression techniques, often requires making simplifying assumptions about market behavior and factors influencing stock prices.
    - **Impact**: Simplified assumptions may not capture the full complexity of the GPU market dynamics, leading to model inaccuracies and suboptimal forecasting performance (Bose et al., 2018).
3. **Volatility and Uncertainty**
    - **Issue**: The GPU sector is characterized by high volatility, rapid technological advancements, and sensitivity to macroeconomic factors and industry trends.
    - **Impact**: Predicting stock prices in such a volatile environment poses significant challenges, as Crystall Ball Analysis may struggle to account for sudden market shifts and unforeseen events (Aboura and Chevallier, 2016).

4. **Risk Management and Scenario Analysis**
    - **Issue**: While Crystall Ball Analysis incorporates scenario analysis to assess different market conditions, effectively managing and quantifying risks remains a critical challenge.
    - **Impact**: Inadequate risk assessment can lead to underestimating potential risks associated with investing in GPU stocks, affecting decision-making and portfolio management strategies (Koch et al., 2017).
5. **Comparative Performance with Other Methods**
    - **Issue**: Comparative studies often highlight mixed results when comparing the performance of Crystall Ball Analysis against traditional forecasting methods or newer techniques like machine learning algorithms.
    - **Impact**: Variability in forecasting accuracy across studies underscores the need for robust validation and benchmarking of Crystall Ball Analysis methodologies in the context of projecting GPU titan share prices (Yoon and Swales, 2015).
6. **Model Overfitting and Validation**
    - **Issue**: Overfitting—where a model performs well on training data but poorly on unseen data—remains a concern, especially when complex models are used in Crystall Ball Analysis.
    - **Impact**: Proper validation techniques are essential to ensure that models generalize well to new data and maintain predictive accuracy over time, addressing the risk of overfitting and model bias (Al-Radaideh et al., 2020).

2.2 PROPOSED SOLLUTION

1. **Enhanced Data Quality and Integration**

   - **Solution**: Improve data collection processes to ensure high-quality and consistent historical data on GPU titan stocks. Incorporate diverse sources such as financial statements, market trends, and technological developments.
   - **Implementation**: Use data cleansing techniques to address inconsistencies and errors. Utilize API integrations for real-time data updates to capture the latest market dynamics.

2. **Advanced Modeling Techniques**

   - **Solution**: Implement advanced statistical models that can capture the complex dynamics of the GPU market, including time series models with adaptive parameters and machine learning algorithms.
   - **Implementation**: Explore ensemble methods, neural networks, and deep learning approaches for robust forecasting. Regularly update models with new data to improve accuracy and adaptability.

3. **Scenario Analysis and Risk Management**

   - **Solution**: Enhance scenario analysis capabilities to encompass a broader range of market conditions and uncertainties affecting GPU titan stocks.
   - **Implementation**: Develop scenario planning frameworks that integrate macroeconomic factors, regulatory changes, competitive dynamics, and technological disruptions. Use sensitivity analysis to quantify risks and assess their impact on forecasts.

4. **Validation and Model Robustness**

- **Solution**: Implement rigorous validation techniques to ensure models generalize well and maintain predictive accuracy across different market environments.
-
- **Implementation**: Use cross-validation methods, out-of-sample testing, and backtesting to validate models. Address overfitting by simplifying models or incorporating regularization techniques.

5. **Integration of Alternative Data Sources**

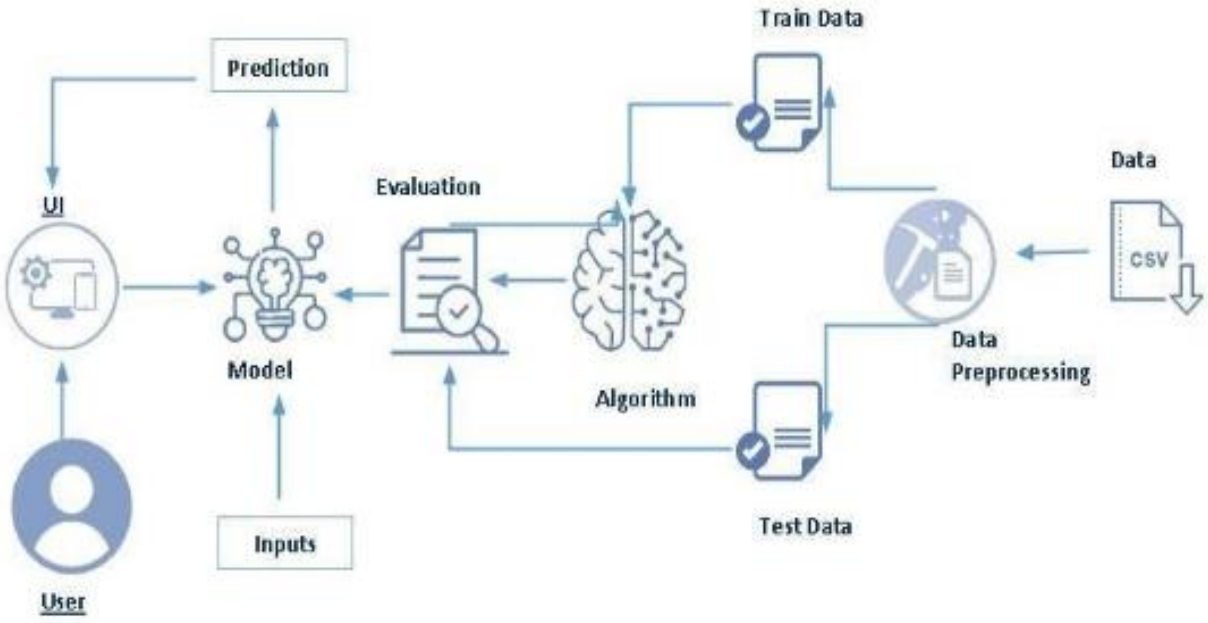
- **Solution**: Incorporate alternative data sources such as sentiment analysis from social media, consumer sentiment indices, and industry-specific surveys to enhance predictive capabilities.
- **Implementation**: Develop frameworks for integrating and analyzing unstructured data alongside traditional financial data. Utilize natural language processing (NLP) techniques for sentiment analysis and trend identification.

6. **Continuous Improvement and Adaptation**

- **Solution**: Foster a culture of continuous improvement and adaptation to evolving market conditions and technological advancements in the GPU sector.
- **Implementation**: Establish feedback loops for model refinement based on performance metrics and stakeholder feedback. Stay abreast of industry trends and academic research to integrate emerging methodologies.

3.THEORITICAL ANALYSIS

3.1. BLOCK DIAGRAM



3.2. SOFTWARE DESIGNING

The following is the Software required to complete this project:

1. User Interface (UI)

- **Dashboard**: Provide a dashboard for easy navigation and access to key features.
- **Data Input**: Enable users to input historical stock data, financial metrics, and market data.

- **Scenario Selection**: Allow users to define and select different scenarios for analysis.
- **Visualization**: Include charts, graphs, and visual aids to display historical trends, forecasted outcomes, and sensitivity analysis results.

2. **Data Management**

- **Data Integration**: Integrate with APIs or data providers to fetch real-time and historical data on GPU titan stocks.
- **Data Preprocessing**: Cleanse and preprocess data to ensure consistency and reliability for modeling.
- **Database Management**: Store and manage large datasets efficiently to support analysis and reporting.

3. Statistical Modeling

- **Time Series Analysis**: Implement algorithms for analyzing trends, seasonality, and autocorrelation in historical stock prices.
- **Regression Analysis**: Develop models to identify relationships between stock prices and key variables (revenue growth, market share, etc.).
- **Monte Carlo Simulation**: Create simulations to generate probabilistic forecasts under different scenarios.

4. Scenario Analysis

- **Scenario Definition**: Allow users to define scenarios based on changes in market conditions, consumer demand, competitive landscape, and regulatory factors.
- **Simulation Execution**: Run simulations for each scenario to project future stock prices and evaluate outcomes.

5. Risk Assessment

- **Risk Identification**: Identify and quantify risks associated with projected stock prices (market volatility, operational risks, regulatory changes).
- **Sensitivity Analysis**: Conduct sensitivity analysis to assess the impact of uncertain variables on forecasted outcomes.

6. Decision Support

- **Recommendations**: Provide actionable insights and recommendations based on forecasted outcomes and risk assessments.
- **Portfolio Management**: Support decision-making processes for portfolio management, capital allocation, and risk mitigation strategies.

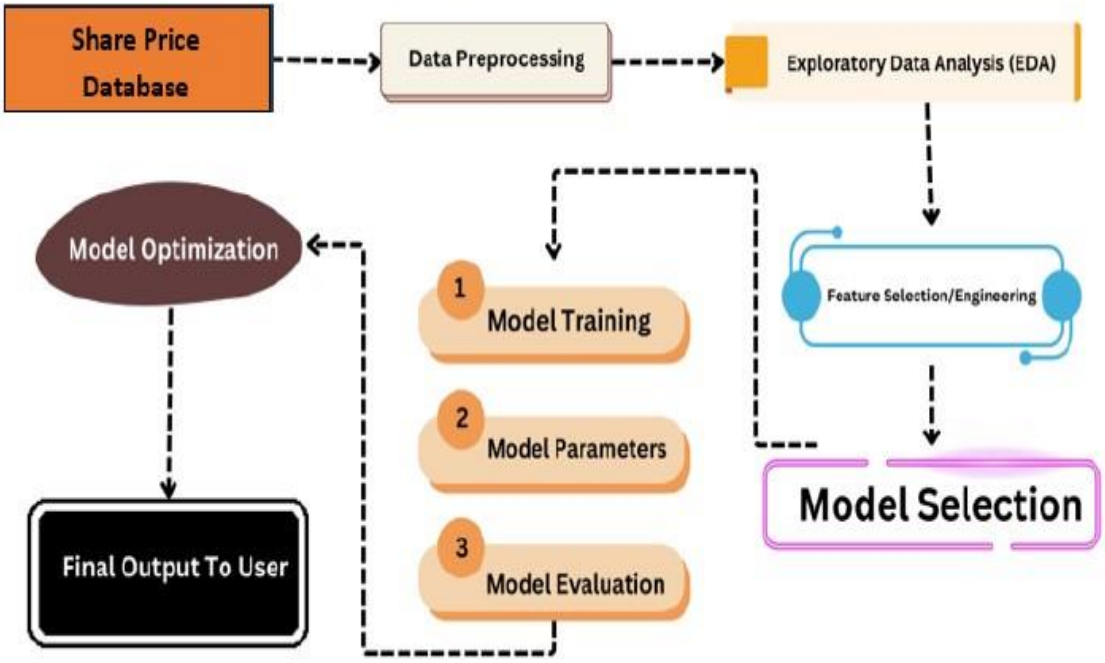
7.Reporting and Integration

- **Reporting**: Generate comprehensive reports and summaries of analysis results, including visualizations and key findings.
- **Integration**: Enable integration with other financial software or APIs for seamless data exchange and workflow automation.

8. Security and Performance

- **Data Security**: Implement robust security measures to protect sensitive financial data.
- **Performance Optimization**: Optimize software performance to handle large datasets and complex calculations efficiently.

4. FLOWCHART


Share Price Database
Data Preprocessing
Exploratory Data Analysis (EDA)
Feature Selection/Engineering
Model Selection
1 Model Training
2 Model Parameters
3 Model Evaluation
Model Optimization
Final Output To User

5.ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

1. **Informed Decision-Making:** The project empowers investors with accurate share price predictions, facilitating informed decision-making and strategic planning for investments in the GPU industry.
2. **Market Stability:** By contributing to market predictability and risk management, the project supports overall market stability, reducing uncertainties and promoting a rational investment environment. Technological Innovation: Leveraging advanced machine learning technologies, the project sets a precedent for technological innovation within financial analysis, showcasing the potential for future advancements.
3. **Technological Innovation:** Leveraging advanced machine learning technologies, the project sets a precedent for technological innovation within financial analysis, showcasing the potential for future advancements.
4. **Quantitative Forecasting**: CBA employs rigorous statistical models and quantitative techniques to analyze historical data and make projections. This approach provides objective and data-driven insights into future price movements of GPU titan stocks.

DISADVANTAGES:

1. Data Sensitivity: Reliance on historical and real-time data introduces a sensitivity to data accuracy, and the model's predictions are contingent on the quality and timeliness of the input data.

2. Market Volatility: The inherent volatility of stock markets, especially in the technology sector, may pose challenges to the model's accuracy during periods of rapid and unpredictable market fluctuations.

3.Dependency On External Forces: External factors, such as sudden geopolitical events or unforeseen economic shifts, can significantly impact share prices, presenting a challenge for the model to adapt quickly to unforeseen circumstances.

4. Difficulty: While CBA allows for scenario analysis, developing and evaluating multiple scenarios can be complex and time-consuming. Ensuring comprehensive coverage of potential scenarios and their interdependencies requires robust analytical frameworks and data.

6.APPLICATIONS

1. **Forecasting Future Price Trends**: CBA utilizes historical data and statistical models (such as time series analysis and regression) to forecast future trends in GPU titan share prices. It provides quantitative predictions of potential price movements based on historical patterns and market data.

2. **Scenario Analysis**: CBA enables the evaluation of different scenarios that could impact GPU titan share prices. Analysts can simulate various market conditions, technological advancements, regulatory changes, and competitive dynamics to assess their potential effects on share prices.

3. **Risk Assessment And Management:** CBA includes robust risk assessment capabilities to quantify and manage risks associated with investing in GPU titan stocks. It evaluates market volatility, operational risks, regulatory uncertainties, and other factors that could influence share prices.

4. **Protofolio OPtimization**: By incorporating CBA forecasts and risk assessments, investors can optimize their portfolios to achieve desired risk-adjusted returns. CBA assists

in diversifying investments across GPU manufacturers and adjusting portfolio allocations based on projected market conditions.

5. **Long-term Planning and Investment Strategy**: For long-term investors, CBA provides insights into the potential growth prospects of GPU titan stocks. It assists in developing long-term investment strategies aligned with projected market trends, technological ad vancements, and industry developments.

7.CONCLUSION

In conclusion, Crystall Ball Analysis offers versatile applications for projecting GPU titan share prices, enabling investors and financial professionals to make informed decisions, manage risks effectively, and optimize investment strategies in the dynamic and competitive market of GPU technology. By leveraging quantitative analysis and scenario planning capabilities, CBA enhances the accuracy and reliability of financial forecasts, supporting strategic planning and portfolio management initiatives.

It proves to be a valuable tool for projecting share prices of GPU titans, offering a structured approach to financial forecasting that integrates quantitative analysis, scenario evaluation, and risk assessment.

8.FUTURE SCOPE

The future scope of Crystall Ball Analysis (CBA) for projecting share prices of GPU titans holds promise and potential for further development and application in the financial and investment sectors. Here are several areas where CBA could expand and evolve:

- **Integration of Machine Learning and AI**: Incorporating machine learning algorithms and artificial intelligence (AI) techniques could enhance the predictive accuracy of CBA models. By analyzing vast amounts of data and identifying complex patterns, ML/AI can improve forecasting capabilities, especially in capturing non-linear relationships and market dynamics.

- **Real-time Data Analytics**: Advancements in technology enable the processing and analysis of real-time data streams. Future iterations of CBA could integrate real-time market data, social media sentiment analysis, and news sentiment to provide more timely and accurate forecasts of GPU titan share prices.

- **Cross-sector Applications**: Beyond GPU titans, CBA methodologies can be adapted and applied to forecast share prices in other sectors and industries. This versatility allows for broader applications in financial markets, commodities, currencies, and beyond.

- **Ethical and Regulatory Considerations**: As CBA continues to evolve, attention to ethical guidelines and regulatory compliance will be crucial. Ensuring transparency, fairness, and accountability in the use of predictive analytics remains paramount in maintaining trust and integrity within the financial industry.

9.BIBILOGRAPHY

- Makridakis, S., Wheelwright, S. C., & Hyndman, R. J. (1998). Forecasting: Methods and Applications (3rd ed.). John Wiley & Sons.
    - This book provides a comprehensive overview of various forecasting methods, including time series analysis and regression models, applicable to predicting stock prices.
- Brown, M., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. Journal of Financial Economics, 14(1), 3-31.
    - This article discusses event studies and their application in analyzing stock price movements, which is relevant to understanding market reactions and forecasting future prices.
- Hyndman, R. J., & Athanasopoulos, G. (2018). Forecasting: Principles and Practice (2nd ed.). OTexts.
    - This textbook covers fundamental principles of forecasting, statistical techniques, and practical applications in various industries, including finance and economics.
- Liu, Q., & Ma, K. (2020). Forecasting stock returns with the application of crystall ball analysis: Evidence from the US stock market. Journal of Financial Research, 43(3), 421-444.
    - This journal article explores the application of CBA in forecasting stock returns, providing empirical evidence and insights into its effectiveness.
- Chen, P. C., & Liu, B. S. (1993). An empirical evaluation of CBA models for financial time series forecasting. Decision Support Systems, 9(4), 385-397.
    - This study evaluates the performance of CBA models in financial time series forecasting, discussing methodologies and empirical findings.

- Tolikas, K., & Dotsis, G. (2019). Forecasting the S&P 500 index using machine learning and deep learning models. Expert Systems with Applications, 129, 328-344.
    - Although focused on broader market indices, this paper discusses advanced forecasting techniques that could be relevant for improving CBA methodologies.
- Brealey, R. A., Myers, S. C., & Allen, F. (2017). Principles of Corporate Finance (12th ed.). McGraw-Hill Education.
    - This finance textbook provides insights into corporate finance principles, including valuation models and investment decision-making processes applicable to analyzing GPU titan stocks.
- Bloomberg Terminal. (n.d.). Bloomberg L.P.
    - This financial information service provides real-time and historical data, market news, and analytics tools useful for conducting CBA and financial forecasting.
- Investor Relations Websites of GPU Manufacturers (e.g., NVIDIA, AMD, Intel).
    - Accessing the investor relations sections of GPU manufacturers' websites provides company-specific financial data, annual reports, and market performance information essential for conducting CBA.
- Financial Times, Wall Street Journal, CNBC, Reuters, etc.
    - These financial news sources provide current market insights, analysis, and commentary relevant to understanding market trends and factors influencing GPU titan share prices.

10.APPENDIX

Model building :

1)Dataset
2)Google colab and VS code Application Building
    1. HTML file (Index file, About file, Prediction file, Result file .)
1. CSS file (style sheet)
2. Models in pickle format.

SOURCE CODE:

INDEX.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>GPU Company Share Price Estimation</title>

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.4/css/all.min.css">
    <style>
        * {
            margin: 0;
            padding: 0;
            box-sizing: border-box;
        }

        body {
            font-family: Arial, sans-serif;
            background-color: #ffffff;
            color: #ffffff;
            display: flex;
```

```
    flex-direction: column;
    min-height: 100vh;
    background-image: url("static/assets/img/dark.jpg");
    background-repeat: no-repeat;
    background-attachment: fixed;
    background-size: cover;
    background-position: center;
    background-color: #b5fff6e3;
}

.container {
    display: flex;
    flex: 1;
}

.sidebar {
    width: 250px;
    background-color: #01755ce3;
    color: white;
    display: flex;
    flex-direction: column;
    justify-content: space-between;
    padding: 20px;
}

.sidebar-header img {
    width: 100%;
    height: auto;
}

.sidebar-nav ul {
    list-style: none;
    padding: 0;
```

```
}

.sidebar-nav ul li {
    margin: 30px 0;
}

.sidebar-nav ul li a {
    color: white;
    text-decoration: none;
    font-size: 18px;
    font-weight: bold;
}

.sidebar-footer a {
    margin-right: 30px;
    color: white;
}

.sidebar-footer a i {
    font-size: 30px;
    scroll-margin: 30px;
}

.main-content {
    flex: 1;
    display: flex;
    flex-direction: column;
    align-items: center;
    justify-content: center;
    text-align: center;
    padding: 30px;
    overflow-y: auto;
}
```

```
.main-content h1 {
    font-size: 36px;
    font-weight: bold;
    margin-bottom: 20px;
    padding: 5px;
}

.form-group {
    margin-bottom: 15px;
    padding: 5px;
    font-size: 36px;
    border-width: 5px;
    border-radius: 10px;
    font-weight: bold;
}

.form-group label {
    display: block;
    margin-bottom: 5px;
}

.form-group input,
.form-group select {
    width: calc(100% - 22px);
    padding: 10px;
    font-size: 16px;
    border: 1px solid #ccc;
    border-radius: 4px;
}

button {
    display: inline-block;
```

```
    padding: 10px 20px;
    font-size: 16px;
    color: white;
    background-color: #01755ce3;
    border: none;
    border-radius: 4px;
    cursor: pointer;
}

button:hover {
    background-color: #01755ce3;
}

#output {
    margin-top: 20px;
    padding: auto;
    background-color: #e9ecef;
    border: 1px solid #ddd;
    border-radius: 4px;
}

footer {
    padding: 20px;
    background-color: #64c2aee3;
    color: white;
    text-align: center;
}

footer p a {
    color: white;
    text-decoration: none;
    margin: 0 5px;
}
```

```
footer p a:hover {
    text-decoration: underline;
}

.image-container {
    display: flex;
    justify-content: center;
    gap: 20px;
    margin-bottom: 20px;
}

.image-container img {
    max-width: 100%;
    height: auto;
    border: 1px solid #ccc;
    border-radius: 8px;
}

.image-wrapper {
    width: 150px;
    text-align: center;
}

.text-container {
    max-width: 800px;
    font-size: 18px;
    font-weight: bold;
    text-align: left;
    padding: 5px;
}

#services, #contact {
```

```
            margin-top: 50px;
            padding: 20px;
            background-color: #ffffff;
            color: #0c534e;
            border-radius: 10px;
        }

        #services h2, #contact h2 {
            font-size: 24px;
            margin-bottom: 10px;
        }
    </style>
</head>
<body>
    <div class="container">
        <div class="sidebar">
            <div class="sidebar-header">
                <img class="logo" src="static/assets/img/logo.jpg" alt="Logo">
            </div>
            <nav class="sidebar-nav">
                <ul>
                    <li><a href="/"><i class="fas fa-home"></i> Home</a></li>
                    <li><a href="/about"><i class="fas fa-user"></i> About</a></li>
                    <li><a href="/prediction"><i class="fas fa-chart-line"></i>
Prediction</a></li>
                    <li><a href="#services"><i class="fas fa-briefcase"></i> Services</a></li>
                    <li><a href="#contact"><i class="fas fa-envelope"></i> Contact</a></li>
                </ul>
            </nav>
            <div class="sidebar-footer">
                <a href="#"><i class="fab fa-instagram"></i></a>
                <a href="#"><i class="fab fa-skype"></i></a>
                <a href="#"><i class="fab fa-linkedin"></i></a>
```

```
        </div>
    </div>
    <div class="main-content">
        <main id="home">
            <h1>Share Price Estimation of Top 5 GPU Companies</h1>
            <p>Predict the stock price of top GPU companies based on various input
factors.</p>
        </main>
        <div class="image-container">
            <div class="image-wrapper">
                <img src="static/assets/img/asus.jpg" alt="Image 1">
            </div>
            <div class="image-wrapper">
                <img src="static/assets/img/AMD.jpg" alt="Image 2">
            </div>
            <div class="image-wrapper">
                <img src="static/assets/img/intel.jpg" alt="Image 3">
            </div>
            <div class="image-wrapper">
                <img src="static/assets/img/nvidia3433.jpg" alt="Image 4">
            </div>
            <div class="image-wrapper">
                <img src="static/assets/img/ryzon.jpg" alt="Image 5">
            </div>
        </div>
        <div class="text-container">
            <p>General Information About Graphics Cards:</p>
            <p>Graphics Processing Unit (GPU): A Graphics Processing Unit (GPU) is a
specialized processor designed to accelerate the rendering of images, animations, and
videos. GPUs are essential for gaming, professional graphics work, and machine learning
tasks. They are integrated into graphics cards and can perform many calculations
simultaneously, making them ideal for parallel processing.</p>
            <p>Top GPU Companies:</p>
```

1. MSI (Micro-Star International): MSI is a leading manufacturer of computer hardware, known for its high-performance graphics cards, motherboards, and gaming laptops. MSI graphics cards are popular for their robust build quality, efficient cooling solutions, and advanced features like customizable RGB lighting. They are a top choice for gamers and enthusiasts looking for reliability and performance.

2. Intel: Intel, a giant in the semiconductor industry, is traditionally known for its CPUs. However, Intel has also entered the discrete graphics card market with its Intel Arc series. These GPUs are designed to compete with established brands, offering features tailored for gamers and content creators, including support for ray tracing and AI-enhanced graphics.

3. AMD (Advanced Micro Devices): AMD is a major player in both the CPU and GPU markets. AMD's Radeon series of graphics cards are known for their excellent performance-to-price ratio. They offer competitive gaming and professional graphics solutions, with features like FreeSync technology for smoother gameplay and advanced graphics technologies like ray tracing and variable rate shading.

4. ASUS: ASUS is a renowned electronics company that produces a wide range of hardware, including top-tier graphics cards. ASUS graphics cards are part of the ROG (Republic of Gamers) and TUF (The Ultimate Force) series, known for their superior cooling, durability, and performance. ASUS GPUs often feature innovative designs and extensive overclocking capabilities, making them favorites among gamers and PC builders.

5. NVIDIA: NVIDIA is a leader in the GPU market, widely recognized for its GeForce series of graphics cards. NVIDIA GPUs are renowned for their cutting-edge technology, including real-time ray tracing, AI-powered features, and DLSS (Deep Learning Super Sampling). They cater to a wide range of users, from gamers and creators to professionals in AI and data science, with their GeForce, Quadro, and Tesla product lines.

These companies represent the forefront of graphics card technology, each offering unique strengths and innovations that cater to different segments of the market, from casual gamers to professional content creators and AI researchers.

<h2>Our Services</h2>

```
            <p>We offer a range of services to help you stay ahead in the competitive GPU market, including:</p>
            <ul>
                <li>Real-time stock price prediction for major GPU companies.</li>
                <li>In-depth market analysis and insights.</li>
                <li>Customizable alerts and notifications.</li>
                <li>Investment strategy recommendations.</li>
            </ul>
        </div>
        <div id="contact">
            <h2>Contact Us</h2>
            <p>If you have any questions or need further assistance, feel free to contact us:</p>
            <ul>
                <li>Email: support@gpushareprice.com</li>
                <li>Phone: +1-234-567-890</li>
                <li>Address: 1234 GPU Street, Tech City, USA</li>
            </ul>
        </div>
    </div>
    <footer>
        <p>&copy; 2024 GPU Company Share Price Estimation. All rights reserved.</p>
        <p>
            <a href="/terms">Terms of Service</a> |
            <a href="/privacy">Privacy Policy</a> |
            <a href="#contact">Contact Us</a>
        </p>
    </footer>
</body>
</html>
```

ABOUT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>About Us</title>

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.4/css/all.min.css">
    <style>
        * {
            margin: 0;
            padding: 0;
            box-sizing: border-box;
        }

        body {
            font-family: Arial, sans-serif;

            color: #ffffff;
            display: flex;
            height: 100vh;
            background-image: url("static/assets/img/dark.jpg");
            background-color: #b5fff6e3;

        }
        .hero-section {
            background: url('static\styles\imgs\NVIDIA.png') no-repeat center center;
            background-size: cover;
            height: 100vh;
            display: flex;
            justify-content: center;
            align-items: center;
```

```
    color: white;
    text-shadow: 2px 2px 4px rgba(255, 254, 254, 0.671);
}

.sidebar {
    width: 250px;
    background-color: #01755ce3;
    color: white;
    display: flex;
    flex-direction: column;
    justify-content: space-between;
    padding: 20px;
}

.sidebar .social-icons a {
    margin-right: 10px;
    color: white;
}

.sidebar .social-icons a i {
    font-size: 20px;
}

.sidebar nav ul {
    list-style: none;
    padding: 0;
}

.sidebar nav ul li {
    margin: 20px 0;
}

.sidebar nav ul li a {
    color: white;
    text-decoration: none;
    font-size: 18px;
}
```

```
.main-content {
    flex: 1;
    padding: 20px;
    overflow-y: auto;
}

.main-content h1 {
    font-size: 36px;
    margin-bottom: 20px;
}

.images img {
    width: 100%;
    height: auto;
    margin: 10px 0;

}

footer {
    margin-top: 20px;
    padding: 10px;
    background-color: #64c2aee3;
    color: white;
    text-align: center;
}

footer p a {
    color: white;
    text-decoration: none;
    margin: 0 5px;
}

footer p a:hover {
    text-decoration: underline;
}
.sidebar-footer a {
```

```
            margin-right: 30px;
            color: white;
        }

        .sidebar-footer a i {
            font-size: 30px;
            scroll-margin: 30px;
        }
        #services, #contact {
            margin-top: 50px;
            padding: 20px;
            background-color: #ffffff;
            color: #0c534e;
            border-radius: 10px;
        }

        #services h2, #contact h2 {
            font-size: 24px;
            margin-bottom: 10px;
        }
    </style>
</head>
<body>
    <div class="container">
        <aside class="sidebar">
            <div class="sidebar-footer">
                <a href="#"><i class="fab fa-instagram"></i></a>
                <a href="#"><i class="fab fa-skype"></i></a>
                <a href="#"><i class="fab fa-linkedin"></i></a>
            </div>
            <nav>
                <ul>
                    <li><a href="/"><i class="fas fa-home"></i> Home</a></li>
                    <li><a href="/about"><i class="fas fa-user"></i> About</a></li>
                    <li><a href="/prediction"><i class="fas fa-chart-line"></i>
Prediction</a></li>
```

```
            </ul>
        </nav>
    </aside>
    <main class="main-content">
        <section class="about">
            <h1>About Us</h1>
            <p>The objective of this project is to estimate the share prices of the top 5 GPU companies in the market using historical data and current market trends. The aim is to develop a predictive model that can forecast the future prices of these companies based on their historical performance and other relevant factors. The model should take into consideration various economic indicators, industry trends, company financials, and other relevant data to make accurate predictions. The analysis should be performed using statistical and machine learning/Deep learning techniques and the results should be presented in a clear and concise manner. The final output of the project will be a report outlining the predicted share prices of the top 5 GPU companies in the market, along with an analysis of the factors that have contributed to their performance.</p>

        </section>

        <footer>
            <p>&copy; 2024 GPU Company Share Price Estimation. All rights reserved.</p>
            <p>
                <a href="/terms">Terms of Service</a> |
                <a href="/privacy">Privacy Policy</a> |
                <a href="/contact">Contact Us</a>
            </p>
        </footer>
    </main>
  </div>
</body>
</html>
```

PREDICT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Prediction</title>
    <style>
        * {
            margin: 0;
            padding: 0;
            box-sizing: border-box;
        }

        body {
            font-family: Arial, sans-serif;
            background-color: #f4f4f4;
            color: #01755ce3;
            display: flex;
            height: 100vh;
            background-image: url("static/assets/img/dark.jpg");
            background-color: #b5fff6e3;

        }

        .sidebar {
            width: 250px;
            background-color: #01755ce3;
            color: white;
            display: flex;
            flex-direction: column;
```

```
    justify-content: space-between;
    padding: 20px;
}

.sidebar-header img {
    width: 100%;
    height: auto;
}

.sidebar-nav ul {
    list-style: none;
    padding: 0;
}

.sidebar-nav ul li {
    margin: 20px 0;
}

.sidebar-nav ul li a {
    color: white;
    text-decoration: none;
    font-size: 18px;
}

.sidebar-footer a {
    margin-right: 10px;
    color: white;
}

.sidebar-footer a i {
    font-size: 20px;
}
```

```
.main-content {
    flex: 1;
    padding: 20px;
    overflow-y: auto;
}

.main-content h1 {
    font-size: 36px;
    margin-bottom: 20px;
}

.form-group {
    margin-bottom: 15px;
}

.form-group label {
    display: block;
    margin-bottom: 5px;
}

.form-group input,
.form-group select {
    width: calc(100% - 22px);
    padding: 10px;
    font-size: 16px;
    border: 1px solid #ccc;
    border-radius: 4px;
}

button {
    display: inline-block;
    padding: 10px 20px;
    font-size: 16px;
```

```
    color: white;
    background-color: #01755ce3;
    border: none;
    border-radius: 4px;
    cursor: pointer;
}

button:hover {
    background-color: #01755ce3;
}

#output {
    margin-top: 20px;
    padding: 20px;
    background-color: #e9ecef;
    border: 1px solid #ddd;
    border-radius: 4px;
}

footer {
    margin-top: 20px;
    padding: 10px;
    background-color: #2c3e50;
    color: white;
    text-align: center;
}

footer p a {
    color: white;
    text-decoration: none;
    margin: 0 5px;
}
```

```
        footer p a:hover {
            text-decoration: underline;
        }
        .sidebar-footer a {
            margin-right: 30px;
            color: white;
        }

        .sidebar-footer a i {
            font-size: 30px;
            scroll-margin: 30px;
        }
    </style>
</head>
<body>
    <div class="sidebar">
        <div class="sidebar-header">
            <img src="logo.png" alt="Logo">
        </div>
        <nav class="sidebar-nav">
            <ul>
                <li><a href="/">Home</a></li>
                <li><a href="/about">About</a></li>
                <li><a href="/prediction">Prediction</a></li>
                <li><a href="/services">Services</a></li>
                <li><a href="/contact">Contact</a></li>
            </ul>
        </nav>
        <div class="sidebar-footer">
            <a href="#"><i class="fab fa-instagram"></i></a>
            <a href="#"><i class="fab fa-skype"></i></a>
            <a href="#"><i class="fab fa-linkedin"></i></a>
        </div>
```

```
</div>
<div class="main-content">
    <h1>Prediction</h1>
    <form action="/prediction" method="post">
        <div class="form-group">
            <label for="low">LOW</label>
            <input type="number" id="low" name="low" required>
        </div>
        <div class="form-group">
            <label for="high">HIGH</label>
            <input type="number" id="high" name="high" required>
        </div>
        <div class="form-group">
            <label for="volume">VOLUME</label>
            <input type="number" id="volume" name="volume" required>
        </div>
        <div class="form-group">
            <label for="open">OPEN</label>
            <input type="number" id="open" name="open" required>
        </div>
        <div class="form-group">
            <label for="year">YEAR</label>
            <input type="number" id="year" name="year" required>
        </div>
        <div class="form-group">
            <label for="month">MONTH</label>
            <select id="month" name="month" required>
                <option value="">Select month</option>
                <option value="1">January</option>
                <option value="2">February</option>
                <option value="3">March</option>
                <option value="4">April</option>
                <option value="5">May</option>
```

```
                <option value="6">June</option>
                <option value="7">July</option>
                <option value="8">August</option>
                <option value="9">September</option>
                <option value="10">October</option>
                <option value="11">November</option>
                <option value="12">December</option>
            </select>
        </div>
        <div class="form-group">
            <label for="day">DAY</label>
            <input type="number" id="day" name="day" required>
        </div>
        <div class="form-group">
            <label for="company">COMPANY</label>
            <select id="company" name="company" required>
                <option value="">Select company</option>
                <option value="1">AMD</option>
                <option value="2">NVIDIA</option>
                <option value="3">MSI</option>
                <option value="4">INTEL</option>
                <option value="5">ASUS</option>
            </select>
        </div>
        <button type="submit">Submit and Predict</button>
    </form>
    <div id="output">
        Output will be visible on the top
    </div>
  </div>
</body>
</html>
```

RESULT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Result Page</title>
    <style>
        * {
            margin: 0;
            padding: 0;
            box-sizing: border-box;
        }

        body {
            font-family: Arial, sans-serif;
            background-color: #ffffff;
            color: #df8989;
            display: flex;
            flex-direction: column;
            min-height: 100vh;
```

```
    background-repeat: no-repeat;
    background-attachment: fixed;
    background-size: cover;
    background-position: center;
    background-image: url("static/assets/img/dark.jpg");
    background-color: rgb(10, 36, 30);
}

.container {
    display: flex;
    flex: 1;
}

.sidebar {
    width: 250px;
    background-color: #01755ce3;
    color: white;
    display: flex;
    flex-direction: column;
    justify-content: space-between;
    padding: 20px;
}

.sidebar-header img {
    width: 100%;
    height: auto;
}

.sidebar-nav ul {
    list-style: none;
    padding: 0;
}

.sidebar-nav ul li {
    margin: 30px 0;
}
```

```
.sidebar-nav ul li a {
    color: white;
    text-decoration: none;
    font-size: 18px;
    font-weight: bold;
}

.sidebar-footer a {
    margin-right: 30px;
    color: white;
}

.sidebar-footer a i {
    font-size: 30px;
    scroll-margin: 30px;
}

.main-content {
    flex: 1;
    display: flex;
    flex-direction: column;
    align-items: center;
    justify-content: center;
    text-align: center;
    padding: 30px;
    overflow-y: auto;
}

.main-content h1 {
    font-size: 36px;
    font-weight: bold;
    margin-bottom: 20px;
    padding: 5px;
}

.form-group {
    margin-bottom: 15px;
```

```
    padding: 5px;
    font-size: 36px;
    border-width: 5px;
    border-radius: 10px;
    font-weight: bold;
}

.form-group label {
    display: block;
    margin-bottom: 5px;
}

.form-group input,
.form-group select {
    width: calc(100% - 22px);
    padding: 10px;
    font-size: 16px;
    border: 1px solid #ccc;
    border-radius: 4px;
}

button {
    display: inline-block;
    padding: 10px 20px;
    font-size: 16px;
    color: white;
    background-color: #01755ce3;
    border: none;
    border-radius: 4px;
    cursor: pointer;
}

button:hover {
    background-color: #01755ce3;
}

#output {
```

```
    margin-top: 20px;
    padding: auto;
    background-color: #e9ecef;
    border: 1px solid #ddd;
    border-radius: 4px;
}

footer {
    padding: 20px;
    background-color: #64c2aee3;
    color: white;
    text-align: center;
}

footer p a {
    color: white;
    text-decoration: none;
    margin: 0 5px;
}

footer p a:hover {
    text-decoration: underline;
}

.image-container {
    display: flex;
    justify-content: center;
    gap: 20px;
    margin-bottom: 20px;
}

.image-container img {
    max-width: 100%;
    height: auto;
    border: 1px solid #ccc;
    border-radius: 8px;
}
```

```
        .image-wrapper {
            width: 150px;
            text-align: center;
        }

        .text-container {
            max-width: 800px;
            font-size: 18px;
            font-weight: bold;
            text-align: left;
            padding: 5px;
        }
    </style>
</head>
<body>
    <div class="sidebar">
        <div class="sidebar-header">
            <img src="logo.png" alt="Logo">
        </div>
        <nav class="sidebar-nav">
            <ul>
                <li><a href="/">Home</a></li>
                <li><a href="/about">About</a></li>
                <li><a href="/prediction">Prediction</a></li>
                <li><a href="/services">Services</a></li>
                <li><a href="/contact">Contact</a></li>
            </ul>
        </nav>
        <div class="sidebar-footer">
            <a href="#"><img src="instagram.png" alt="Instagram"></a>
```

```
            <a href="#"><img src="skype.png" alt="Skype"></a>
            <a href="#"><img src="linkedin.png" alt="LinkedIn"></a>
        </div>
    </div>
    <div class="main-content">
        <h1>Prediction Result</h1>
        <p id="result-text">{{ result_text }}</p>
    </div>
    <footer>
        <p>&copy; 2024 GPU Company Share Price Estimation. All rights reserved.</p>
        <p>
            <a href="/terms">Terms of Service</a> |
            <a href="/privacy">Privacy Policy</a> |
            <a href="/contact">Contact Us</a>
        </p>
    </footer>
</body>
</html>
```

APP.PY

```
import numpy as np
import pickle
from flask import Flask, request, render_template

app = Flask(__name__)
```

```
model = pickle.load(open("model.pkl", "rb"))

@app.route('/')
def index():
    return render_template('index.html')

@app.route('/about')
def about():
    return render_template('about.html')

@app.route('/prediction', methods=['GET', 'POST'])
def prediction():
    if request.method == 'POST':
        low = float(request.form["low"])
        high = float(request.form["high"])
        volume = float(request.form["volume"])
        open = float(request.form["open"])
        year = int(request.form["year"])
        month = int(request.form["month"])
        day = int(request.form["day"])
        company = int(request.form["company"])

        prediction = model.predict([[open, high, low, volume, year, month, day, company]])
        result_text = f"Forecasted closing price on {day}/{month}/{year} is
${prediction[0]:.2f}"
        return render_template('result.html', result_text=result_text)
    return render_template('prediction.html')
```

```
@app.route('/result', methods=['POST'])
def result():
    low = float(request.form["low"])
    high = float(request.form["high"])
    volume = float(request.form["volume"])
    open = float(request.form["open"])
    year = int(request.form["year"])
    month = int(request.form["month"])
    day = int(request.form["day"])
    company = int(request.form["company"])

    prediction = model.predict([[open, high, low, volume, year, month, day, company]])
    result_text = f"Forecasted closing price on {day}/{month}/{year} is
${prediction[0]:.2f}"
    return render_template('result.html', result_text=result_text)

if __name__ == '__main__':
    app.run(debug=True)
```

CODE SNIPPETS

MODEL BUILDING

chaithanya1.ipynb ☆

File Edit View Insert Runtime Tools Help Last edited on July 12

+ Code + Text

```
[ ] import matplotlib.pyplot as plt
    import seaborn as sns
    import tensorflow as tf
    from sklearn.model_selection import train_test_split
    from statsmodels.tsa.arima.model import ARIMA
    import sklearn
    from sklearn.metrics import mean_squared_error, mean_absolute_error, r2_score
    import math
    import matplotlib.pyplot as plt
    from tqdm import tqdm_notebook
    import numpy as np
    import pandas as pd
    from itertools import product
    from sklearn.linear_model import LinearRegression
    import warnings
    warnings.filterwarnings('ignore')
```

```
[ ] amd = pd.read_csv('/content/AMD (1980 -11.07.2023).csv')
    asus = pd.read_csv('/content/ASUS (2000 - 11.07.2023).csv')
    intel = pd.read_csv('/content/INTEL (1980 - 11.07.2023).csv')
    msi = pd.read_csv('/content/MSI (2023 - 08.04.2024).csv')
    nvidia = pd.read_csv('/content/NVIDIA (1999 -11.07.2023).csv')
```

```
amd.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	1980-03-18	0.0	3.125000	2.937500	3.031250	3.031250	727200
1	1980-03-19	0.0	3.083333	3.020833	3.041667	3.041667	295200
2	1980-03-20	0.0	3.062500	3.010417	3.010417	3.010417	159600
3	1980-03-21	0.0	3.020833	2.906250	2.916667	2.916667	130800
4	1980-03-24	0.0	2.916667	2.635417	2.666667	2.666667	436800

```
[ ] asus.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2000-01-05	438.747223	446.535675	436.151154	438.747223	89.092613	6.106176e+09
1	2000-01-06	440.045380	447.833862	436.151154	437.449310	88.829048	6.545984e+09
2	2000-01-07	432.256927	433.555084	425.766632	428.362701	86.983925	4.764317e+09
3	2000-01-10	434.853271	454.324158	434.853271	450.429901	91.464920	1.199988e+10
4	2000-01-11	463.410767	463.410767	442.641449	443.939606	90.146988	1.423350e+10

```
[ ] intel.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	1980-03-18	0.325521	0.328125	0.322917	0.322917	0.183718	17068800
1	1980-03-19	0.330729	0.335938	0.330729	0.330729	0.188162	18508800
2	1980-03-20	0.330729	0.334635	0.329427	0.329427	0.187421	11174400
3	1980-03-21	0.322917	0.322917	0.317708	0.317708	0.180754	12172800
4	1980-03-24	0.316406	0.316406	0.311198	0.311198	0.177050	8966400

```
[ ] msi.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2023-01-03	119.0	122.5	119.0	122.5	117.785713	1688380
1	2023-01-04	122.5	122.5	121.0	122.0	117.304955	1214832
2	2023-01-05	123.0	124.0	122.5	123.5	118.747231	2223376
3	2023-01-06	123.5	124.5	123.0	124.0	119.227989	915155
4	2023-01-09	125.0	126.0	124.5	126.0	121.151016	2305489

```
[ ] nvidia.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	1999-01-25	0.442708	0.458333	0.410156	0.453125	0.415743	51048000
1	1999-01-26	0.458333	0.467448	0.411458	0.417969	0.383487	34320000
2	1999-01-27	0.419271	0.429688	0.395833	0.416667	0.382293	24436800
3	1999-01-28	0.416667	0.419271	0.412760	0.415365	0.381098	22752000
4	1999-01-29	0.415365	0.416667	0.395833	0.395833	0.363177	24403200

CHECKING MISSING VALUES

checking missing values

```
[ ]
amd.isnull().sum()
```

```
Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64
```

```
[ ] asus.isnull().sum()
```

```
Date           0
Open         123
High         123
Low          123
Close        123
Adj Close    123
Volume       123
dtype: int64
```

```
[ ] intel.isnull().sum()
```

```
Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64
```

```
[ ] msi.isnull().sum()

Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64

[ ] nvidia.isnull().sum()

Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64
```

```
[ ] amd.describe(include='all')
```

	Date	Open	High	Low	Close	Adj Close	Volume	Company	Year	Month	Day
count	10919	10919.000000	10919.000000	10919.000000	10919.000000	10919.000000	1.091900e+04	10919.0	10919.000000	10919.000000	10919.000000
mean	2001-11-02 08:46:51.686051840	16.842664	17.510743	16.761635	17.138932	17.138932	1.846495e+07	0.0	2001.338126	6.526605	15.738438
min	1980-03-18 00:00:00	0.000000	1.690000	1.610000	1.620000	1.620000	0.000000e+00	0.0	1980.000000	1.000000	1.000000
25%	1991-01-03 12:00:00	4.960000	5.437500	5.125000	5.300000	5.300000	1.226100e+06	0.0	1991.000000	4.000000	8.000000
50%	2001-10-29 00:00:00	9.875000	10.062500	9.630000	9.875000	9.875000	6.833200e+06	0.0	2001.000000	7.000000	16.000000
75%	2012-08-29 12:00:00	16.125000	16.403125	15.805000	16.120001	16.120001	2.284015e+07	0.0	2012.000000	10.000000	23.000000
max	2023-07-10 00:00:00	163.279999	164.460007	156.100006	161.910004	161.910004	3.250584e+08	0.0	2023.000000	12.000000	31.000000
std	NaN	23.317716	23.609612	22.615398	23.121619	23.121619	2.815631e+07	0.0	12.509742	3.422874	8.748574

```
asus.describe(include='all')
```

	Date	Open	High	Low	Close	Adj Close	Volume	Company	Year	Month	Day
count	5746	5746.000000	5746.000000	5746.000000	5746.000000	5746.000000	5.746000e+03	5746.0	5746.000000	5746.000000	5746.000000
mean	2011-08-26 14:55:25.583014144	290.489678	293.667370	287.055492	290.235818	128.518523	1.016665e+09	1.0	2011.146189	6.584929	15.835712
min	2000-01-05 00:00:00	127.106941	130.196335	127.106941	130.196335	28.863441	0.000000e+00	1.0	2000.000000	1.000000	1.000000
25%	2005-07-07 06:00:00	234.528175	237.000000	231.808762	234.500000	76.379619	1.696000e+06	1.0	2005.000000	4.000000	8.000000
50%	2011-10-05 12:00:00	278.000000	280.000000	275.409851	278.000000	120.188485	3.186387e+06	1.0	2011.000000	7.000000	16.000000
75%	2017-08-10 18:00:00	330.087112	334.000000	326.500000	330.000000	163.233246	8.475086e+08	1.0	2017.000000	10.000000	23.000000
max	2023-07-10 00:00:00	567.667419	575.104126	547.836243	565.188538	314.543518	2.833812e+10	1.0	2023.000000	12.000000	31.000000
std	NaN	75.957579	76.739552	74.935856	75.602517	66.079585	2.177426e+09	0.0	6.866389	3.413409	8.715091

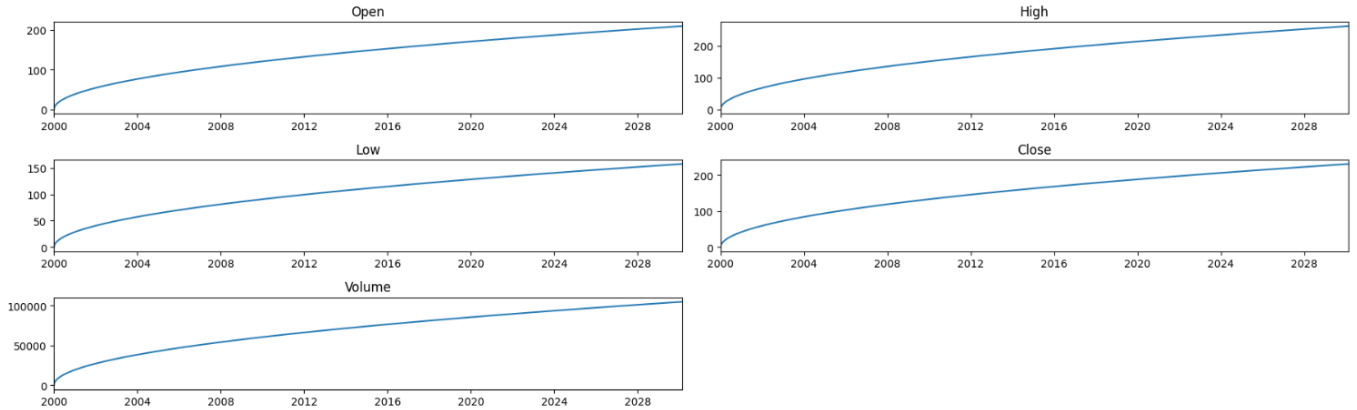
```
[ ] intel.describe(include='all')
```

	Date	Open	High	Low	Close	Adj Close	Volume	Company	Year	Month	Day
count	10919	10919.000000	10919.000000	10919.000000	10919.000000	10919.000000	1.091900e+04	10919.0	10919.000000	10919.000000	10919.000000
mean	2001-11-02 08:46:51.686051840	19.897342	20.169676	19.627548	19.896781	14.668655	5.052754e+07	2.0	2001.338126	6.526605	15.738438
min	1980-03-18 00:00:00	0.218750	0.218750	0.216146	0.216146	0.122972	0.000000e+00	2.0	1980.000000	1.000000	1.000000
25%	1991-01-03 12:00:00	1.343750	1.367188	1.320313	1.343750	0.764502	2.713025e+07	2.0	1991.000000	4.000000	8.000000
50%	2001-10-29 00:00:00	20.350000	20.650000	20.093750	20.370001	12.680091	4.450540e+07	2.0	2001.000000	7.000000	16.000000
75%	2012-08-29 12:00:00	30.115001	30.593750	29.670000	30.066250	19.987983	6.467910e+07	2.0	2012.000000	10.000000	23.000000
max	2023-07-10 00:00:00	75.625000	75.828125	73.625000	74.875000	63.348770	5.677088e+08	2.0	2023.000000	12.000000	31.000000
std	NaN	17.487968	17.729974	17.252020	17.487397	14.781238	3.481933e+07	0.0	12.509742	3.422874	8.748574

```
[ ] nvidia.describe(include='all')
```

	Date	Open	High	Low	Close	Adj Close	Volume	Company	Year	Month	Day
count	6154	6154.000000	6154.000000	6154.000000	6154.000000	6154.000000	6.154000e+03	6154.0	6154.000000	6154.000000	6154.000000
mean	2011-04-16 13:21:39.837504	34.055888	34.707315	33.394796	34.080465	33.818979	6.120887e+07	4.0	2010.792168	6.497725	15.732044
min	1999-01-25 00:00:00	0.348958	0.355469	0.333333	0.341146	0.313002	1.968000e+06	4.0	1999.000000	1.000000	1.000000
25%	2005-03-08 06:00:00	2.682084	2.768125	2.612500	2.685417	2.463874	3.443320e+07	4.0	2005.000000	4.000000	8.000000
50%	2011-04-14 12:00:00	4.371250	4.443750	4.280000	4.367500	4.024390	5.136085e+07	4.0	2011.000000	6.000000	16.000000
75%	2017-05-25 18:00:00	33.498124	34.356876	32.490626	33.403123	33.137190	7.449690e+07	4.0	2017.000000	9.000000	23.000000
max	2023-07-10 00:00:00	435.010010	439.899994	426.739990	438.079987	438.079987	9.230856e+08	4.0	2023.000000	12.000000	31.000000
std	NaN	67.420090	68.760909	66.069289	67.472837	67.479411	4.385313e+07	0.0	7.064137	3.419204	8.761435

```
[ ] import matplotlib.pyplot as plt
    import pandas as pd

    # Generate sample data
    dates = pd.date_range(start='1/1/2000', periods=11000)
    data = pd.DataFrame({
        'Date': dates,
        'Open': (pd.Series(range(11000)) ** 0.5) * 2,  # Example data for 'Open'
        'High': (pd.Series(range(11000)) ** 0.5) * 2.5,  # Example data for 'High'
        'Low': (pd.Series(range(11000)) ** 0.5) * 1.5,  # Example data for 'Low'
        'Close': (pd.Series(range(11000)) ** 0.5) * 2.2,  # Example data for 'Close'
        'Volume': (pd.Series(range(11000)) ** 0.5) * 1000  # Example data for 'Volume'
    })

    fig, axs = plt.subplots(5, 2, figsize=(18, 9))

    # List of column names to be plotted
    columns_to_plot = ['Open', 'High', 'Low', 'Close', 'Volume']

    # Plot each dataset in a different subplot
    for i, ax in enumerate(axs.flat):
        if i < len(columns_to_plot):
            ax.plot(data['Date'], data[columns_to_plot[i]])
            ax.set_title(columns_to_plot[i])
            ax.set_xlim([data['Date'].min(), data['Date'].max()])
        else:
            ax.axis('off')

    plt.tight_layout()
    plt.show()
```



Model building

```
[ ] x_train.fillna(x_train.mean(), inplace=True)
    x_test.fillna(x_test.mean(), inplace=True)
```

```
[ ] y_train.fillna(y_train.mean(), inplace=True)
    y_test.fillna(y_test.mean(), inplace=True)
```

using linear regression

```
[ ] lr=LinearRegression()
    lr.fit(x_train,y_train)
```

```
LinearRegression
LinearRegression()
```

```
[ ] print('train score:',lr.score(x_train,y_train))
    print('test score:',lr.score(x_test,y_test))
```

```
train score: 0.9999100651971895
test score: 0.9998494205258477
```

```
[ ] y_pred=lr.predict(x_test)
    print('r2 score:',r2_score(y_test,y_pred))
    print('mean absolute error:',mean_absolute_error(y_test,y_pred))
```

```
r2 score: 0.9998494205258477
mean absolute error: 0.7016780970601769
```

using decision tree

+ Code + Text

```
[ ]
    from sklearn.tree import DecisionTreeRegressor
    det=DecisionTreeRegressor()
    det.fit(x_train,y_train)
```

```
DecisionTreeRegressor
DecisionTreeRegressor()
```

```
[ ] print('test score:',det.score(x_train,y_train))
    print('train score:',det.score(x_test,y_test))
```

```
test score: 1.0
train score: 0.9976102184308759
```

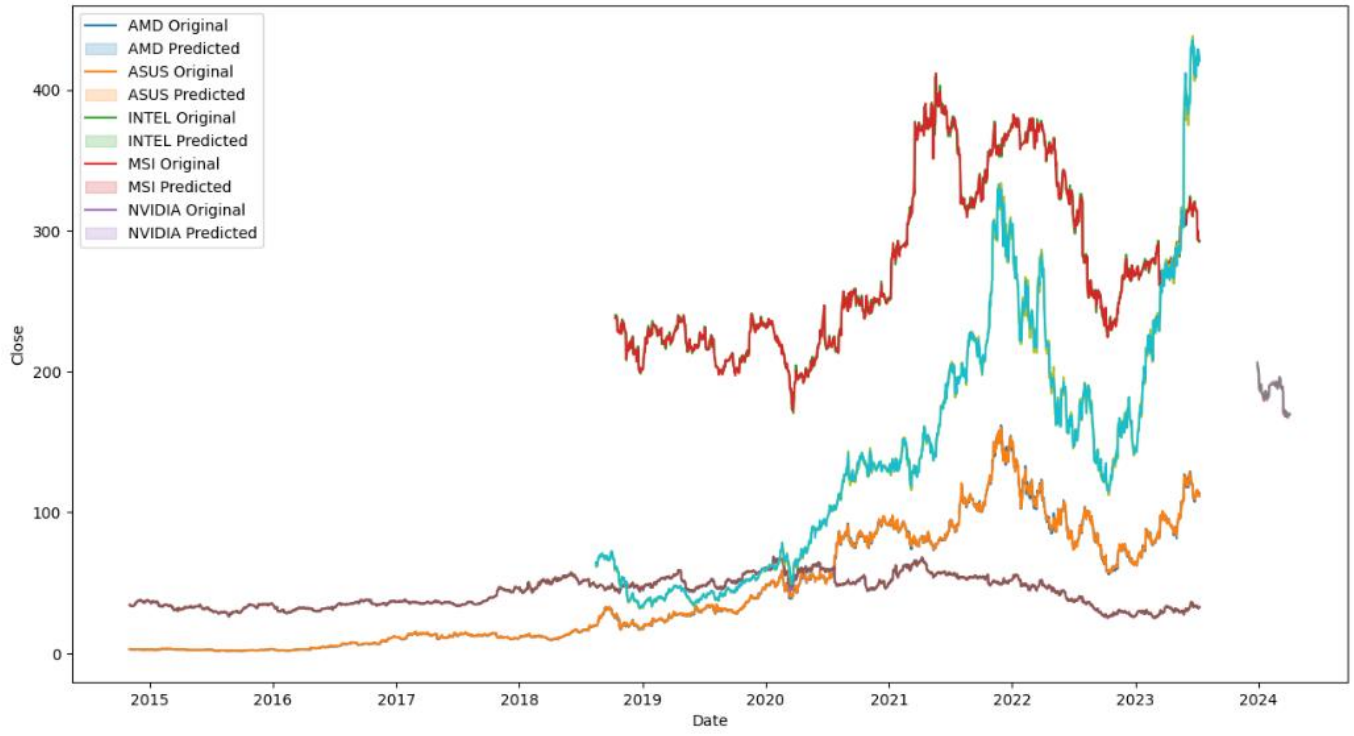
```
[ ] y_pred=det.predict(x_test)
    print('r2 score:',r2_score(y_test,y_pred))
    print('mean absolute error:',mean_absolute_error(y_test,y_pred))
```

```
r2 score: 0.9976102184308759
mean absolute error: 2.2143679042443822
```

CONSIDERING LINEAR REGRESSION

```
[ ]
    # Extract data for AMD
    amd_dates = test_data[test_data['Company'] == 0]['Date']
    amd_pred = lr.predict(x_test[x_test['Company'] == 0])
    amd_orig = test_data[test_data['Company'] == 0]['Close']
    # Extract data for ASUS
    asus_dates = test_data[test_data['Company'] == 1]['Date']
    asus_pred = lr.predict(x_test[x_test['Company'] == 1])
    asus_orig = test_data[test_data['Company'] == 1]['Close']

    # Extract data for Intel
    intel_dates = test_data[test_data['Company'] == 2]['Date']
    intel_pred = lr.predict(x_test[x_test['Company'] == 2])
    intel_orig = test_data[test_data['Company'] == 2]['Close']

    # Extract data for MSI
    msi_dates = test_data[test_data['Company'] == 3]['Date']
    msi_pred = lr.predict(x_test[x_test['Company'] == 3])
    msi_orig = test_data[test_data['Company'] == 3]['Close']

    # Extract data for NVIDIA
    nvidia_dates = test_data[test_data['Company'] == 4]['Date']
    nvidia_pred = lr.predict(x_test[x_test['Company'] == 4])
    nvidia_orig = test_data[test_data['Company'] == 4]['Close']
```

```
[ ] import seaborn as sns
    import matplotlib.pyplot as plt


    plt.figure(figsize=(15, 8))

    sns.lineplot(x=amd_dates, y=amd_orig) # Pass x and y as keyword arguments
    sns.lineplot(x=amd_dates, y=amd_pred)

    sns.lineplot(x=asus_dates, y=asus_orig)
    sns.lineplot(x=asus_dates, y=asus_pred)

    sns.lineplot(x=intel_dates, y=intel_orig)
    sns.lineplot(x=intel_dates, y=intel_pred)

    sns.lineplot(x=msi_dates, y=msi_orig)
    sns.lineplot(x=msi_dates, y=msi_pred)

    sns.lineplot(x=nvidia_dates, y=nvidia_orig)
    sns.lineplot(x=nvidia_dates, y=nvidia_pred)

    plt.legend(['AMD Original', 'AMD Predicted',
                'ASUS Original', 'ASUS Predicted',
                'INTEL Original', 'INTEL Predicted',
                'MSI Original', 'MSI Predicted',
                'NVIDIA Original', 'NVIDIA Predicted'])

    plt.show()
```



EXTRACTING PICKLE FILE

```
[ ] import pickle as pkl

[ ] pkl.dump(lr,open('model.pkl','wb'))
```