# STOCK MARKET ANALYSIS AND PREDICTION

#### A Project Report

Submitted in partial fulfillment of

the requirements for the award of the Degree of

**BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)**

#### By

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#### DEPARTMENT OF INFORMATION TECHNOLOGY

**TOLANI COLLEGE OF COMMERCE (AUTONOMOUS)**

***(Affiliated to University of Mumbai)***

#### MUMBAI, 400 093 MAHARASHTRA 2023 – 2024

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**CERTIFICATE**

This is to certify that the project entitled, "**Stock Market Analysis and Prediction**”, is bonafied work of  **Akash Singh** bearing roll no: **50** submitted in partial fulfillment of the requirements for the award of degree of BACHELOR OF SCIENCE in INFORMATIONTECHNOLOGY from University of Mumbai.

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# ABSTRACT

The “STOCK MARKET ANALYSIS AND PREDICTION” using historical price data and basic machine learning techniques. The objective is to provide a concise yet effective method for individuals interested in understanding and forecasting stock trends. The analysis begins by collecting historical stock price data, typically including open, close, high, and low prices, along with trading volume. Basic statistical measures such as mean, standard deviation, and correlation are computed to gain insights into the stock's historical performance and its relationship with market indices.

Machine learning models, including linear regression and moving averages, are employed for prediction. These models utilize historical price data to make short-term projections, recognizing underlying trends and patterns. The accuracy of predictions is evaluated using metrics such as mean squared error or root mean squared error. To enhance predictive power, sentiment analysis of relevant news and social media data can be integrated. Sentiment scores reflecting positive, negative, or neutral opinions can offer valuable inputs into the forecasting models.

In conclusion, this study demonstrates a simplified yet effective methodology for stock market analysis and prediction. By combining historical price data and basic machine learning techniques, individuals can gain insights into stock trends and make informed decisions. While acknowledging the inherent uncertainty of financial markets, this approach serves as a valuable starting point for individuals looking to navigate the complexities of stock trading.

Keywords: stock market, analysis, prediction, historical data, trend analysis, price patterns, statistics, forecasting.

# ACKNOWLEDGEMENT

It takes great pleasure to me to present project report on **“STOCK MARKET ANALYSIS AND PREDICTION”**.

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I would like to express my thanks and gratitude to my parents and their utmost support during the academic year so that I can focus properly on my project. With proper coordination and full fledge cooperation among me and my guide, I was able to complete this project successfully.

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AKASH SINGH

AMAN JAISWAL

# DECLARATION

I hereby declare that the project entitled, “**STOCK MARKET ANALYSIS AND PREDICTION”,** done at Tolani College of Commerce, has not been in any case duplicated to submit to any other universities for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university.

The project is done in partial fulfillment of the requirements for the award of degree of **BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)** to be submitted as final semester project as part of our curriculum.

Signature of Students (Akash Singh)

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# INTRODUCTION

### Introduction:-

The stock market, often referred to as the heart of a nation's economy, is a dynamic arena where financial instruments, such as stocks and bonds, are traded. It serves as a platform

for companies to raise capital and for investors to allocate their funds in pursuit of financial growth.

The ever-evolving nature of the stock market, influenced by a myriad of economic,

political, and social factors, presents both opportunities and challenges for market participants. In this context, the utilization of data-driven approaches for stock market analysis and prediction has become increasingly crucial.

Over the years, advancements in technology have led to an unprecedented surge in the availability of financial data. This deluge of information, ranging from company financials and market indices to news sentiment and social media chatter, has provided a fertile

ground for researchers, analysts, and investors to explore new ways of understanding and predicting stock market movements.

This research endeavors to delve into the realm of stock market analysis and prediction, aiming to unravel the methodologies and tools that empower market participants to make informed decisions.

The multifaceted nature of stock market behavior necessitates a holistic approach that encompasses various analytical techniques, from fundamental and technical analysis to cutting-edge machine learning algorithms. By examining the strengths and limitations of these approaches, this study seeks to illuminate the potential implications for investors, traders, and decision makers.

### Background:-

With Yahoo Finance is a widely recognized and reputable financial website that offers a comprehensive set of tools and resources for investors and individuals interested in finance and stock market analysis.

Stock Information: Yahoo Finance provides detailed information about individual stocks, including real-time and historical stock prices, trading volumes,

market capitalization, and other key metrics.

News and Analysis: The website offers a wealth of financial news and analysis articles, including coverage of market trends, company earnings reports, and economic developments..

Interactive Charts: Yahoo Finance offers interactive and customizable stock charts that allow users to analyze historical price movements, apply technical indicators, and draw trendlines.

Portfolio Tracking: Users can create and manage investment portfolios, track

the performance of their holdings, and receive alerts about significant price changes.

Financial Statements: You can access a company's financial statements, including income statements, balance sheets, and cash flow statements, which are

essential for fundamental analysis.

Stock Screeners: Yahoo Finance provides stock screeners that allow users to

filter and search for stocks based on specific criteria, such as market capitalization, sector, or P/E ratio.

Economic Calendar: The website offers an economic calendar that highlights important economic events, such as government reports and earnings releases, which can impact the financial markets.

### Objective:-

The objective of stock market analysis and prediction is to leverage historical market data, financial indicators, and various analytical techniques to gain insights into the behavior of stocks and the overall market. This analysis aims to identify trends, patterns, and potential factors influencing stock price movements. By applying statistical models, machine learning algorithms, and fundamental analysis, the goal is to make informed predictions about future price changes, helping investors and traders make more informed decisions regarding buying, selling, or holding

stocks. However, it's important to note that the stock market is inherently unpredictable and subject to a multitude of complex factors, and while analysis can provide

valuable insights, it can never guarantee absolute accuracy in predicting market movements.

### Purpose, Scope and Applicability:-

* + 1. **Purpose:-**

The purpose of stock market analysis and prediction is to help investors and traders make informed decisions by analyzing historical data, market trends, and relevant indicators. This process involves using various tools and techniques to understand how stocks have performed in the past and to identify potential patterns that might indicate future price movements. While predictions are not always accurate due to the complexity of market dynamics, the aim is to provide valuable insights that can guide individuals in their investment strategies and risk management.

### Scope:-

Data Collection:

Sources of historical stock price data, financial statements, and market indicators. Data preprocessing and cleaning techniques.

Technical analysis: Chart patterns, indicators, and trend identification.

Fundamental analysis: Financial ratios, earnings reports, and company performance evaluation. Sentiment analysis: Monitoring news sentiment, social media trends, and their impact on stocks. Machine learning models: Algorithms for predictive modeling and pattern recognition.

Regression analysis: Establishing relationships between stock prices and influencing factors. Macroeconomic indicators: Interest rates, GDP growth, unemployment rates.

Market sentiment: Behavioral influences on stock prices.

Industry-specific factors: Sector trends, regulations, innovations.

Time Horizons:

Short-term trading analysis. Long-term investment analysis.

Medium-term trend identification.

Tools and Software: Mention tools like Excel, Python, R, statistical packages, and data visualization libraries. Ethical Considerations: Insider trading regulations.

Adherence to market regulations and ethical practices.

Limitations: Acknowledge the inherent uncertainty and unpredictability of stock markets. Address the potential risks and challenges of prediction.

### Applicability:-

* + - * Describe how the analysis is used in investment, trading, and financial decision-making.
      * Highlight scenarios where accurate predictions can lead to profitable outcome

### Achievements:-

* + - * Successful predictions lead to profitable investment decisions.
      * Consistently outperforming market benchmarks showcases effective analysis.
      * Accurate predictions aid in identifying and mitigating potential risks.
      * Diversification and hedging strategies are informed by data-driven insights.
      * Precise predictions enable optimal timing for entering or exiting positions.
      * Maximizing gains and minimizing losses through strategic execution.
      * Analysis assists in optimizing asset allocation for balanced growth.
      * Achieving an optimal risk-return profile to align with investor goals.
      * Development of AI-driven models and algorithms for prediction enhances technological innovation.
      * Contributes to the advancement of predictive analytics.

# SURVEY OF TECHNOLOGIES

Survey on Tools and Technologies Applicable For Website Development

### Abstract:-

The survey explores the utilization of Python and Streamlit as tools and technologies for website development. Python, renowned for its versatility and extensive library support, offers web developers a robust programming language to create dynamic and interactive websites.

Streamlit, a Python library, simplifies the development process further by enabling the creation of web applications with minimal effort, thanks to its intuitive interface and real-time updates. This survey delves into the effectiveness of Python and Streamlit in website development, examining their capabilities, advantages, and potential drawbacks, aiming to provide insights into their practicality and relevance in modern web development.

Python's Versatility: Python's adaptability for various applications, from data analysis and scientific computing to web development and automation, makes it an indispensable language in the tech world.

Streamlit's Simplicity: Streamlit's intuitive API empowers individuals with limited programming experience to create impressive data-driven web applications without extensive coding.

Applications in Data Science: Python's extensive libraries, coupled with Streamlit's capabilities, have ushered in a new era in data science, enabling professionals to develop interactive dashboards, data visualizations, and machine learning prototypes with ease.

Efficiency and Collaboration: The synergy between Python and Streamlit accelerates project development, encourages collaboration between data scientists and developers, and facilitates the sharing of insights with stakeholders.

Challenges and Future Developments: While Python and Streamlit offer remarkable advantages, this survey also discusses potential challenges, such as scalability concerns and security considerations, and offers insights into ongoing developments in the Python and Streamlit ecosystems.

### Introduction:-

In the realm of website development, Python and Streamlit have emerged as a powerful combination of tools and technologies for creating interactive and user-friendly web applications. Python, renowned for its simplicity and versatility, serves as the programming language backbone, allowing developers to build robust backend systems and integrate various libraries and frameworks seamlessly. Streamlit, on the other hand, is a dynamic web app framework designed specifically for data scientists and developers, enabling them to transform data scripts into web applications with minimal effort. Together, Python and Streamlit offer a compelling solution for website development, catering to both data-driven applications and general web projects with their efficiency and ease of use.

Python is a versatile and beginner-friendly programming language known for its readability and extensive libraries. It's often referred to as a "Swiss Army knife" for programmers because of its wide range of applications. Python is used in web development, data analysis, machine learning, artificial intelligence, and much more.

Key Python Features:

* + - * + Easy-to-learn syntax: Python's clean and concise code makes it accessible to beginners.
        + Rich library ecosystem: Python offers numerous libraries like NumPy, Pandas, and Matplotlib for data analysis, and frameworks like Django and Flask for web development.
        + Cross-platform compatibility: Python runs on various operating systems, making it highly adaptable.

Streamlit:

Streamlit is a Python library that simplifies the process of creating interactive web applications. It's designed for data scientists and engineers who want to turn data scripts into shareable web apps quickly and easily, without extensive web development knowledge.

Key Streamlit Features:

* + - * + Rapid development: With Streamlit, you can transform data scripts into interactive apps with just a few lines of Python code.
        + Data visualization: Streamlit seamlessly integrates with popular data visualization libraries, making it simple to create charts, plots, and dashboards.
        + Customization: While Streamlit is beginner-friendly, it also allows for advanced customization and integration with external tools and services.

Why Python and Streamlit Together:

When Python and Streamlit are combined, you have a powerful duo for creating data-driven web applications. Python provides the robust back-end functionality for data manipulation and analysis, while Streamlit offers a straightforward way to build user-friendly front-end interfaces.

In summary, Python is a versatile and widely-used programming language, while Streamlit is a Python library that streamlines the creation of interactive web applications. Together, they empower developers and data scientists to bring their data to life in an accessible and user-friendly manner, making complex tasks seem effortless. Whether you're a beginner or an experienced coder, Python and Streamlit are an excellent combination to explore for your next project

### Tools Used To Develop web App:- Introduction of Web App:-

Developing a web application for stock market analysis and prediction in Python involves leveraging a variety of tools and technologies to create a robust and user-friendly platform. This one- page introduction provides an overview of the key tools commonly used in building such applications.

Python is a versatile, high-level programming language well-suited for web application development. Its simplicity, readability, and vast ecosystem of libraries make it a popular choice.

Web frameworks like Django, Flask, and FastAPI simplify the development of web applications. They offer features such as routing, templating, and database integration.

Python's data analysis libraries, including Pandas, NumPy, and SciPy, enable data manipulation, analysis, and statistical modeling. These are essential for processing stock market data.

Libraries like Matplotlib, Seaborn, and Plotly allow you to create interactive and informative data visualizations, such as price charts and trend analysis graphs. Building RESTful APIs with libraries like Django REST framework or Flask-RESTful allows for seamless communication between the front-end and back-end components of the web app.

Security is crucial. Tools like OAuth2, JWT (JSON Web Tokens), or built-in authentication modules in web frameworks help secure user accounts and data access. Platforms like AWS, Heroku, or Azure provide cloud hosting solutions for deploying web applications. Containerization with Docker simplifies deployment management.

Using version control systems like Git and platforms like GitHub or GitLab ensures collaborative development, code tracking, and easy project management. Tools like Prometheus and Grafana enable real-time monitoring of application performance and user engagement. Analytics tools help gather insights from user interactions.

### Tools Information:-

The different tools are used to first of design the Web App which are:

**Visual Studio** : – Visual Studio Code (VS Code) is a popular, free, and open-source code editor developed by Microsoft. It's designed for a wide range of programming languages and offers a lightweight, customizable, and efficient development environment. With its extensive library of extensions, VS Code can be tailored to meet specific programming needs, from web development to data science. It features an integrated terminal, Git integration, and intelligent code completion. Its real-time collaboration capabilities, debugging tools, and support for various operating systems make it a versatile choice for developers, enabling efficient code writing, testing, and deployment in a user-friendly and highly productive environment.

**Visual Studio Language Resources** – Visual Studio is a popular integrated development environment (IDE) primarily used for software development in various programming languages. Visual Studio provides extensive language support for a wide range of programming languages.

**Python Libraries :-**Python boasts a vast ecosystem of libraries and modules that enhance its functionality across various domains. Here are some of the most commonly used Python libraries, categorized by their respective domains:

1. **Pandas**: A versatile library for data manipulation and analysis, featuring data structures like DataFrames and Series
2. **NumPy**: Essential for numerical computing, providing arrays and mathematical functions for scientific applications..

### Technologies Used To Design and Develop Website :-

**Website**:-

Designing and developing a website using Python and Streamlit is an innovative approach that combines the power of Python for backend functionality with Streamlit for creating interactive and data-driven web applications

### Advantages and Limitations of Website Technology:- Advantages of Android:-

#### Ease of Use:

Python is known for its simplicity and readability, making it an excellent choice for developers of all skill levels. Streamlit, built specifically for data apps, is designed to be user-friendly and quick to learn. Developers can create interactive web applications with minimal effort.

#### Data Visualization

Python has a rich ecosystem of data visualization libraries like Matplotlib, Seaborn, Plotly, and Bokeh. Streamlit seamlessly integrates with these libraries, making it easy to create interactive data visualizations.

#### Cross-Platform:

Python and Streamlit are cross-platform, meaning you can develop and deploy applications on various operating systems, including Windows, macOS, and Linux.

1. **Customization**

While Streamlit simplifies web development, it also allows for customization. Developers can integrate custom CSS, JavaScript, and HTML when needed to tailor the application's appearance and behavior.

1. **Deployment Options:**

Streamlit apps can be easily deployed on various hosting platforms, including cloud services like AWS, Heroku, and Streamlit Sharing. This simplifies the deployment process, making it accessible to a broader audience.

1. **Community**

Python has a large and active community, resulting in a vast number of libraries and packages availab le for various tasks. Streamlit also has a growing community, and its creators regularly release updates and improvements.

### Limitations of Android:-

#### Limited Front-End Control-

Streamlit abstracts much of the front-end development, which is great for simplicity but limits control over the look and feel of the application. Developers seeking highly customized designs may find Streamlit's capabilities limited

#### Scalability :

While Streamlit is excellent for prototyping and small to medium-sized applications, it may

fa ce scalability issues for larger, more complex web applications. It's not designed for building massive enterprise-level web apps..

1. **Performance:**- Streamlit applications can be slower compared to more optimized web development frameworks, especially for real-time applications or applications with high concurrency requirements.
2. **Limited Template Choices**- Streamlit offers limited built-in templates for application layouts. If you require complex and highly customized layouts, you may need to invest more effort in building them.
3. **Browser Compatibility:** Streamlit apps may not work perfectly in all browsers, as they heavily rely on the browser's ability to render JavaScript**.**

### Justification of selection of Technology:-

The selection of technology for stock market analysis is a crucial decision, as it can significantly impact the efficiency, accuracy, and capabilities of your analysis platform

1. Python as the Primary Language:

Versatility: Python is a versatile language that can handle data manipulation, analysis, and visualization effectively. Its extensive library ecosystem makes it an excellent choice for handling stock market data.Innovative.

1. Streamlit for Web Application Development:

Rapid Development: Streamlit simplifies web application development with Python, allowing for the quick creation of interactive dashboards and data-driven interfaces.

User-Friendly: Streamlit's ease of use means that analysts and developers can quickly build user-friendly applications without extensive web development expertise.

1. Data Analysis

**Pandas and NumPy**: These libraries provide powerful tools for data manipulation, enabling the efficient handling of large datasets commonly found in stock market analysis.

1. Financial Data Integration:

Alpha Vantage, Yahoo Finance API, or Quandl: These APIs provide reliable and up-to-date financial data for analysis and prediction.

1. Web Front-End with Streamlit:

**Simplicity:** Streamlit simplifies the creation of interactive web interfaces without the need for extensive front-end development skills**.**

**Flexibility:** It allows for the integration of Python code directly into web apps, enabling real-time updates and user interaction**.**

1. Security and Scalability:

By leveraging established cloud providers and following best practices, you can ensure the security

and scalability of your application.

1. Community and Documentation:

Python, Streamlit, and associated libraries have active and supportive communities with extensive documentation, tutorials, and resources.

1. Customization

Python's extensibility allows for custom solutions and integration with other tools and APIs as needed for specific stock market analysis requirement

### Conclusion:-

The t selection of Python, Streamlit, and associated libraries for stock market analysis is justified due to their versatility, ease of use, robust data analysis capabilities, and the ability to quickly develop interactive web applications. These technologies empower analysts and developers to build effective and user-friendly tools for analyzing and predicting stock market trends and making informed investment decisions.

# SYSTEM ANALYSIS

### Problem Definition:- Spotting error message

Streamlit is a Python library used for creating web applications with minimal effort, and like any software development, you may encounter various error messages during the development process.

Here's how you can approach spotting error messages in Streamlit:.

#### Run Your Streamlit App:-

First, make sure your Streamlit app is running. You can typically start it by running a Python script tha tcontains your Streamlit code,Replace your\_app.py with the actual name of your Streamlit application file.

#### Check the Terminal/Console:-

The terminal or console where you started your Streamlit app will often display error messages when something goes wrong. Errors can include Python exceptions, syntax errors, and Streamlit-specific issues.

Carefully read through the error message to understand what went wrong.

#### Use Try-Except Blocks:-

In your Streamlit code, you can use try-except blocks to catch and handle errors gracefully. This can help you provide more informative error messages to users.

#### Check Your Code:-

Review your Streamlit code for any syntax errors, missing imports, or logical mistakes. Common issues include incorrect variable names, incorrect indentation, or missing brackets.

#### Debugging Tools:-

You can use debugging tools like 'pdb' (Python Debugger) to step through your code and identify issues. You can add breakpoints and inspect variables to understand what's happening at different stages of your application.

#### Review Dependencies:-

Sometimes, errors can be caused by incompatible library versions or missing dependencies. Make sure to check your virtual environment or package manager (e.g., pip or conda) to ensure all required packages are installed and up to date.

### * Modular Description:

* **Homepage :** The landing page of the website, providing an overview of the site.
* **Stock Quote:** Provides detailed information about a specific stock.
* **Market News:** Provides up-to-date news and articles related to the stock market.**.**
* **User Accounts:** Allows users to create and manage their accounts.
* **Stock Screener:** Helps users filter and find stocks based on specific criteria.
* **Trading Tools:** Offers tools and resources for traders and investors.
* **Market Data API:** A backend module that collects and serves real-time market data.
* **Security and Privacy:** Ensures the security of user data and transactions.
* **Market Data API:** A backend module that collects and serves real-time market data.

# REQUIREMENTS ANALYSIS

### Functional Requirement: Authentication

* + - **Login-** The user can login to the authentication system username and password.
    - **Logout-** The user can log out from the apps after complete their work.
    - **Login failure-** If the user does not match in the login phase or the user has not yet being authorized by the admin.

### Non-Functional Requirement:

#### Performance Requirement

Performance requirements define the acceptable response times for system functions: *-*

1. The system shall take initial load time depending on the internet connection strength which also depends on the media from which the application is running.
2. The performance shall depend on the hardware components of the client.
3. The Stock market website must be accessible and up and running 24 hours a day, 7 days a week and 365 days a year.
4. The project shall display clear human-readable error messages.

#### Maintainability Requirement

It should be easy to add, remove or modify modules in this website. Debugging should not be difficult.

#### Availability Requirement

The website should be available 24 x 7. Services should be provided to the customers as and when requested.

|  |  |  |
| --- | --- | --- |
| **4.2Software and Hardware Requirement:-**  **4.2.1.1 Hardware Requirement:-** | | |
| **For development In System:** |  |  |
| RAM | Minimum 4 GB |
| Processor | Core2Duo Or Above |
| Space Required | 3 |
| **For development In Mobile:** |  |
| Version | All device |
| **1.2 Hardware Requirement table:**  **4.2.2 Software Requirement:-** | | |
| **For development of Application in Systems:** |  |  |
| Operating System | Windows 10 or Above, |
| Front-End Language | Python development language. |
| Back-End Database | SQLite |
| **1.3. Software Requirement table:**  Page **17** of **41** | | |

## Preliminary Product Description:-

The first step in the system development life cycle is the preliminary description to determine the feasibility of the system. The purpose of the preliminary description is to evaluate project request. It is not a design study nor does it include the collection of details to describe the business system in all respect.

Rather, it’s the collecting of information that helps committee members to evaluate the merit of the project request and make an informal judgement about the feasibility of the proposed project.

#### Analysts working on the preliminary investigation should accomplish the fallowing

**objectives:-**

* + - Clarify and understand the project request.
    - Determine the size of the project.
    - Assess costs and benefits of alternative approaches.
    - Report the findings to management, with recommendations outlining the Acceptance or rejection of the proposal.
    - Determine the technical and operational feasibility of alternative approaches.

# Planning and Scheduling:-

## Planning:-

The purpose of Project Planning is to identify the scope of the project, estimate the work involved, and create a project schedule. Project planning begins with requirements that define the software to be developed. The project plan is then developed to describe the tasks that will lead to completion.

## Scheduling:-

The project schedule is the tool that communicates what work needs to be performed, which resources of the project members will perform the work and the timeframes in which that work needs to be performed. The project schedule should reflect all of the work associated with delivering the project on time

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task No** | **Task Name** | **Start Date** | **End Date** | **Duration** |
| **T1** | Requirement Gathering | 5-Aug-23 | 25-Aug-23 | 20 |
| **T2** | Requirement Analysis | 25-Aug-23 | 10-Sep-23 | 16 |
| **T3** | Design | 10-Sep-23 | 28-Sep-23 | 18 |
| **T4** | Coding | 28-Sep-23 | 10-Nov-23 | 44 |
| **T5** | Testing | 10-Nov-23 | 30-Nov-23 | 20 |
| **T6** | Deployment | 30-Nov-23 | 21-Jan-24 | 21 |
| **T7** | Implementation | 21-Jan-24 | 4-Feb-24 | 14 |

**1.1. Planning and scheduling table:**

### Gantt chart:

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale.

Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity. This allows you to see at a glance.

* What the various activities are
* When each activity begins and ends
* How long each activity is scheduled to last
* Where activities overlap with other activities, and by how much
* The start and end date of the whole project

To summarize, a Gantt chart shows you what has to be done (the activities) and when (the schedule).



REQUIREMENT ANALYSIS

50

**16**

REQUIREMENT GATHERING

**20**

0

10

20

30

40

**18**

DESIGN

**44**

CODING

**20**

TESTING

**21**

DEPLOYMENT

**14**

IMPLEMENTATION

**Duration**

T5

T6

T7

**Fig: - 1 Gantt Chart for project Schedule Task against No of Days**

T1

T2

T3

T4

# SYSTEM DESIGN

## SYSTEM DESIGN:-

System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system.

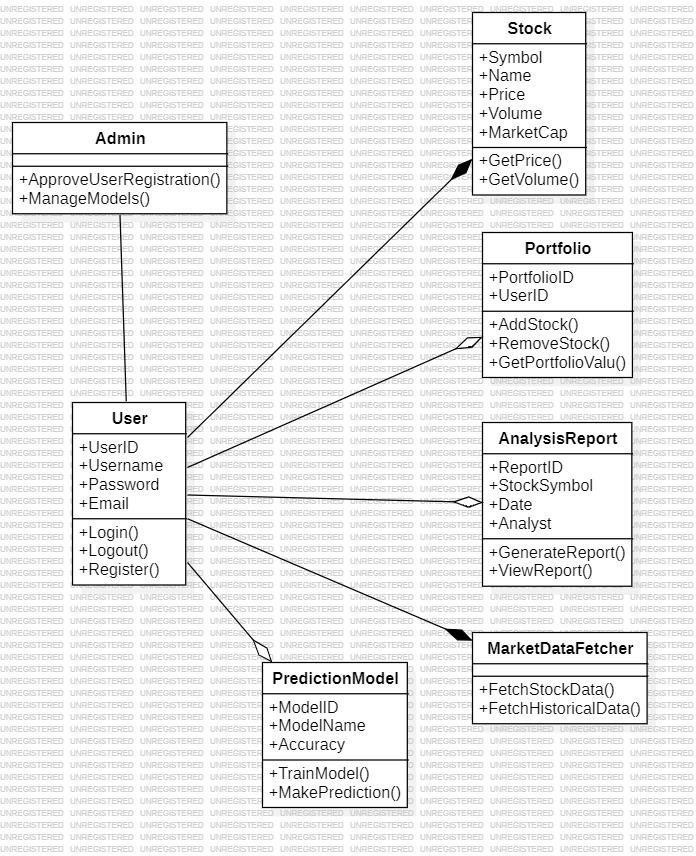
**Following diagrams are:**

* + - * Class Diagram
      * Sequence Diagram
      * Use case Diagram
      * Activity Diagram
      * ER Diagram

### Class Diagram:-

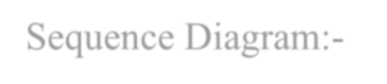
The Stock Market system class diagram describe the structure of a Doctor Appointment system classes, of their attributes, operation (or method), and the relationship among objects. The main classes of the Doctor Appointment System are Doctors, Login, Selection, Blood, Admin, User, and Appointment.

* + **User: -** Represents individuals or entities who interact with the stock market system.
  + **Admin: -** Represents administrators who have special privileges and control over the stock market system.
  + **Market Data Fetcher: -** Represents components responsible for fetching real-time market data, including price updates, volume, and other relevant information.
  + **Prediction Model : -** Represents models used for predicting stock market trends or outcomes.
  + **Analysis Report:-** Represents reports generated based on stock market data and analysis.
  + **Portfolio:-** Represents a collection of stocks and other assets held by an investor or trader
  + **Stock :-** Represents a particular stock or security available for trading in the stock market.



**Fig: - 1 Class Diagram of Stock Market**

1. Sequence Diagram:-

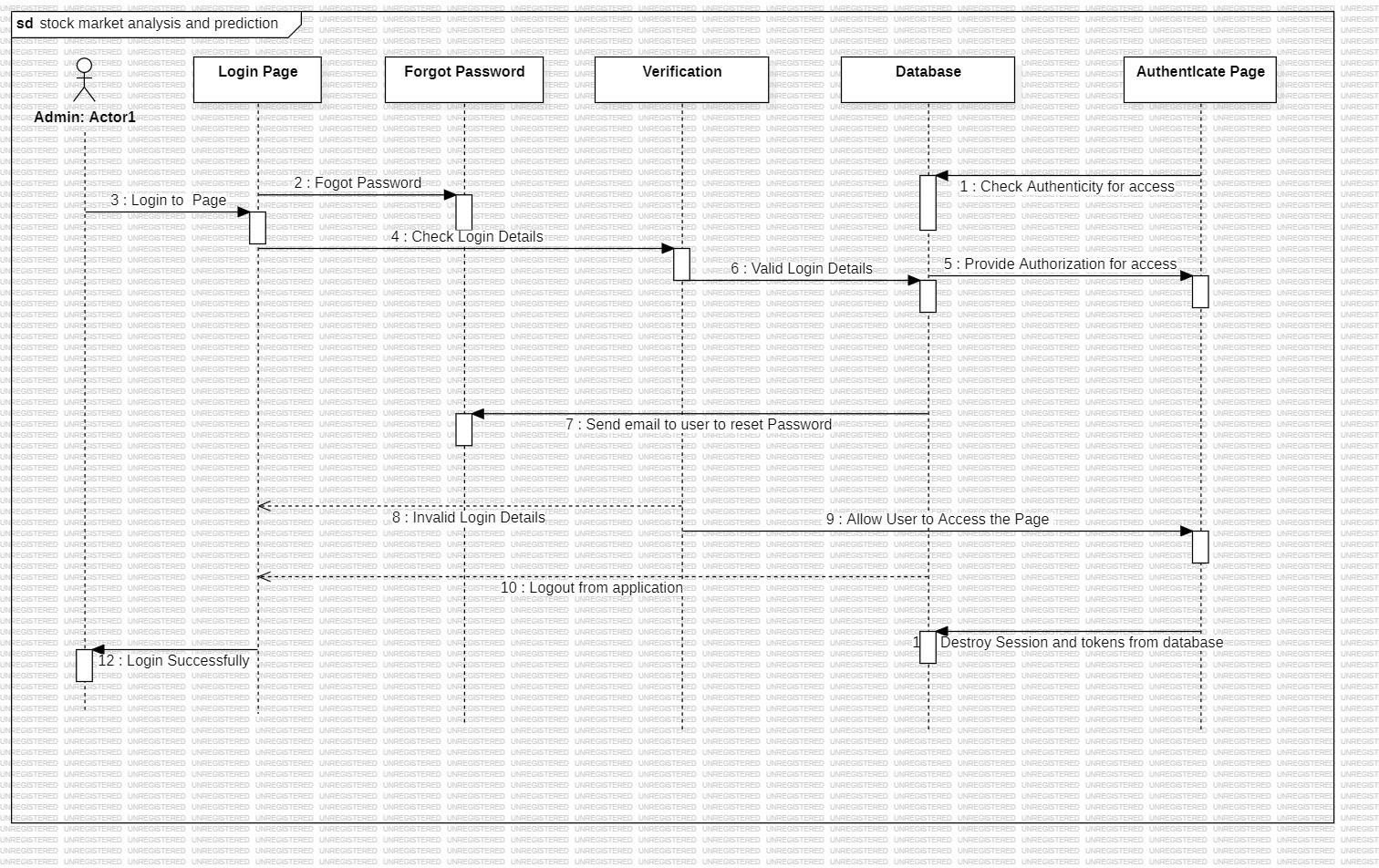


A UML Sequence Diagram for a Stock Market System describes the interactions and sequences of messages between objects or components in the system. Here's a high-level description of the elements and interactions you might depict in a UML Sequence Diagram for a stock market system.

The various objects in the Login Object , Forgot Password Object, Verification Object Database Object , Authentication Object interact over the course of the sequence, and user will not be able to access this page without verifying their identity.

The instance of class objects involved in this UML Sequence Diagram of Stock Market System are as Follows:-

* + Login Object
  + Forgot Password Object
  + Verification Object
  + Database Object
  + Authentication Object



**Fig: -2 Sequence Diagram of Stock Market**

### Use case Diagram:-

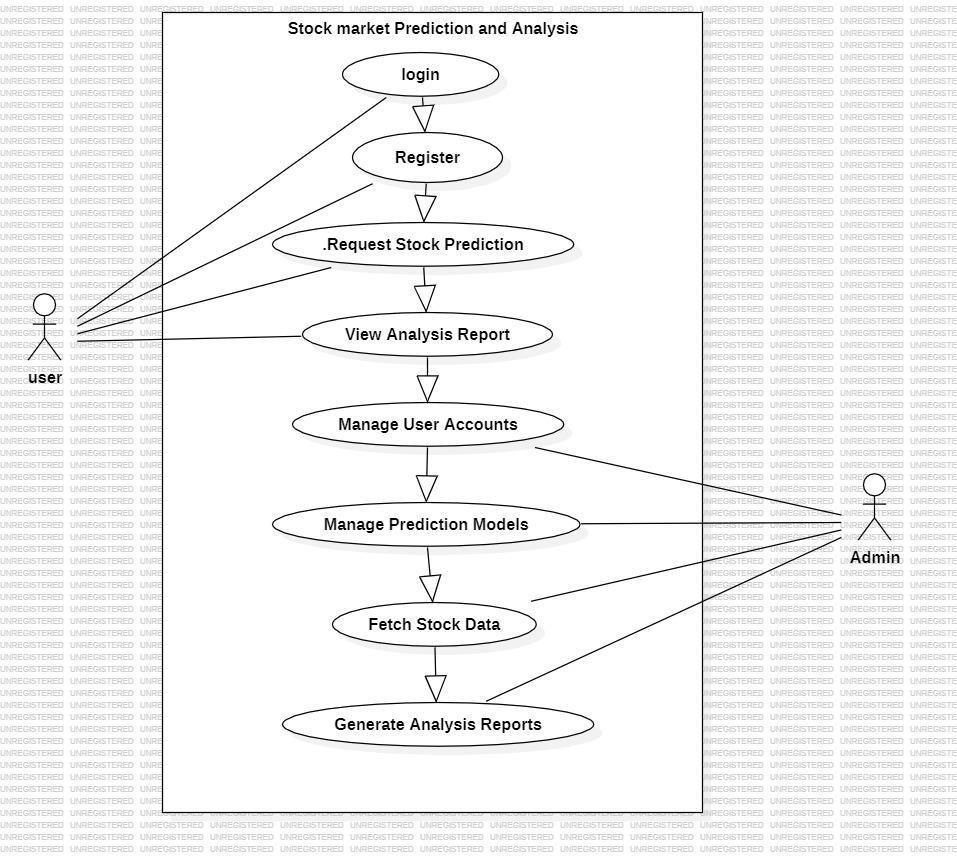
A use case diagram for a stock market system illustrates the different interactions and functionalities within the system, involving various actors and use cases. Here's a description of the main elements you might find in a stock market use case diagram:

A use case diagram for a stock market system provides a concise visual representation of the system's key functionalities and how different actors interact

Major element of the UML use case diagram of Stock Market System is shown on the use case diagram:-

The relationship between and among the actor and the use cases of Stock Market System:-

* + **Admin Entity: -** Use case of System is Manage User Account , Manage prediction model and Fetch stock data , generate Analysis report.
  + **User Entity: -** Use case of System is Manage login Account , Manage register and Request stock prediction report, view analysis report



**Fig: - 3 Use Case Diagram of Stock Market**

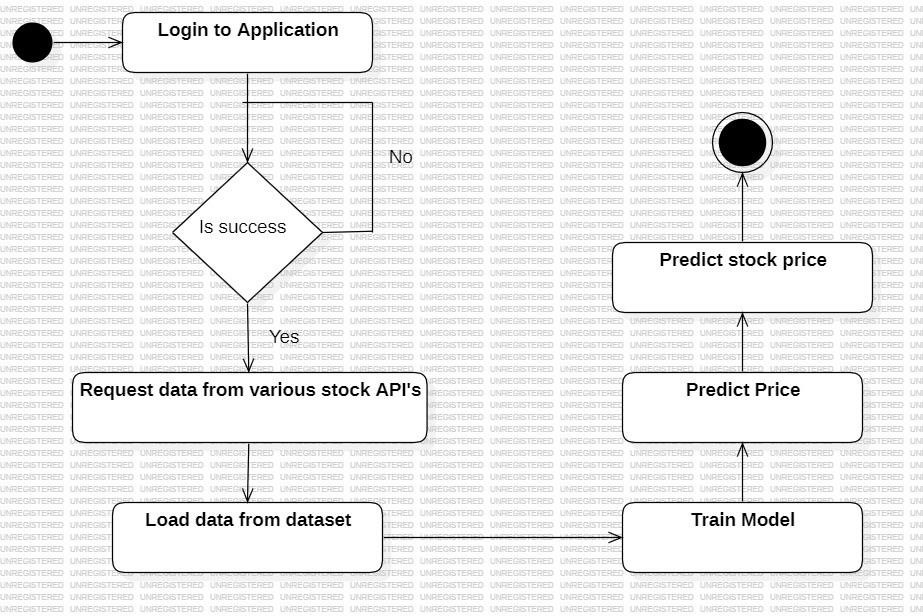
### Activity Diagram:-

This is the **Activity UML diagram of Doctor Appointment System** which show the flow between the activities of Test, schedule, Doctor, Appointment, Blood. The main activity involve in this UML Activity Diagram of Doctor Appointment System are as follows:

* + Login activity
  + Request data from various stock API Activity
  + Load data from dataset Activity
  + Trail Activity
  + Predict price Activity
  + Predict Stock Activity

### Features Of the Activity UML Diagram of Stock Market system:-

* In his Login Activity, This activity represents the process of user authentication and login to the system. Appointment is secure and user can access these page after login.
* Request Data from Various Stock API Activity: This activity involves sending requests to various stock market APIs or data providers to retrieve real-time or historical stock market data.
* Load Data from Dataset Activity:This activity involves loading historical stock market data from a dataset or database.
* Trail Activity:The "Trail Activity" seems to represent a trial or testing phase, where various stock market strategies or models are evaluated and tested.
* Predict Price Activity:This activity represents the process of predicting stock prices based on historical data or other factors.
* Predict Stock Activity:This activity focuses on predicting the future performance of specific stocks or assets.

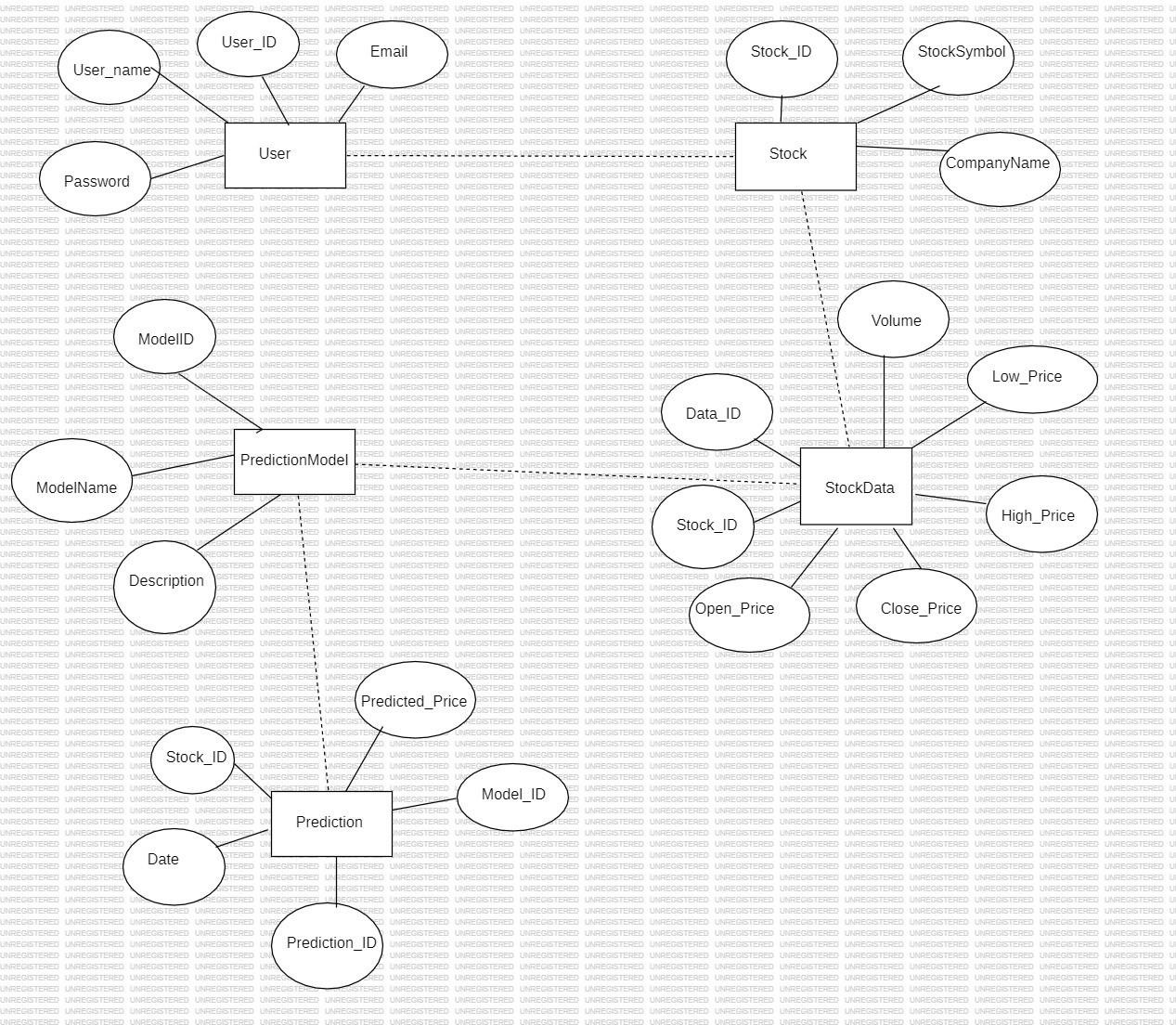


**Fig: - 4 Activity Diagram of Stock Market**

### ER Diagram:-

The ER (Entity Relationship) Entity-Relationship (ER) diagram for a Stock Market Analysis and Prediction system is a complex task that would typically involve multiple entities, relationships, and attributes of Stock Market System functionalities. The Main entities of the Stock Market Analysis and Prediction system Doctointment System entities and their attributes:

* + **User: -** Attributes: UserID (Primary Key), Username, Password, Email, Role.
  + **Stock: -** Attributes: StockID (Primary Key), StockSymbol, CompanyName.
  + **StockData:** - Attributes: DataID (Primary Key), StockID (Foreign Key), Date, OpenPrice, ClosePrice, HighPrice, LowPrice, Volume.
  + **PredictionModel:-** Attributes: ModelID (Primary Key), ModelName, Description.
  + **Prediction:**- Attributes: PredictionID , ModelID .StockID , Date, PredictedPrice.



**Fig: - 5 ER Diagram of Stock Market**

# IMPLEMENTATION AND TESTING

### Implementation Approaches

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# 

# CONCLUSIONS

## Conclusion

In the world of finance and investment, information is power. Making informed decisions in the stock market is crucial for investors, traders, and financial professionals. Over the past decades, stock market analysis and prediction systems have evolved significantly, offering tools and insights that empower stakeholders to navigate the complexities of the financial markets. This conclusion delves into the key takeaways and implications of such systems.

Stock market analysis and prediction systems have revolutionized how investors approach the financial markets. By harnessing vast amounts of historical and real-time data, these systems provide users with data-driven insights, enabling them to make informed investment decisions. Whether it's analyzing historical stock prices, tracking market trends, or predicting future price movements, these systems have become indispensable for investors seeking to maximize their returns and manage risk..

A cornerstone of stock market analysis and prediction systems is the application of advanced data analytics and machine learning techniques. These systems leverage historical market data to identify patterns, correlations, and trends that may be difficult for human analysts to discern. Machine learning models, such as neural networks and decision trees, can process vast datasets and generate predictions with remarkable accuracy. As a result, investors and financial professionals can gain a competitive edge by leveraging these cutting-edge technologies.

#### Challenges and Limitations:

While stock market analysis and prediction systems offer numerous benefits, they are not without challenges and limitations. One of the primary challenges is the inherent unpredictability of financial markets. Despite the sophistication of predictive models, factors like unexpected economic events, geopolitical developments, and market sentiment can lead to unpredictable price fluctuations. Additionally, data quality and model accuracy are critical factors that require ongoing attention and refinement

### Significance of the System

User and Admin have different login activities for security. User can stock by area wise and category wise.

The user can know the stock’s information through the web application. Admin can configure the database and modify the data in it.

### Limitations of the System

**System Defects**

the limitations of a "system defect" or potential issues with a system. However, your question is somewhat vague and lacks specific context some common limitations and issues that can be associated with various types of systems

Little Memory for Storage Data Connection

Battery Issues. Performance Problems. Software Issues.

# Future Scope of the Project

There are also few features which can be integrated with this system to make it more flexible. Below list shows the future points to be consider

* + Advancements in artificial intelligence and machine learning are poised to revolutionize stock market analysis by enabling more accurate predictions and real- time data analysis.
  + The increasing availability of big data and historical market data will provide analysts with a wealth of information to develop more sophisticated predictive models.
  + Algorithmic trading, powered by AI, will continue to gain popularity, leading to faster and more efficient execution of trades
  + Robo-advisors and AI-driven investment platforms will become increasingly prevalent, making personalized investment advice more accessible to a broader range of investors.
  + Sentiment analysis through natural language processing (NLP) will play a crucial role in assessing market sentiment and its impact on stock prices.

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## Glossary:-

**API-** Application Programme Interface **UML-** Unified Modelling Language **URL-** Uniform Resource Locator



**NDK-** Native Development Kit

**SDK-** Software Development Kit