**Real-Time Stock Analysis and Prediction**

**Using Python and Yahoo Finance**

**A Project Report**

Submitted in partial fulfilment of the requirements for the   
**Award of the degree of**

**Master of Computer Application**

**By**

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**Centre for Distance and Online Education**

**LOVELY PROFESSIONAL UNIVERSITY**

**PHAGWARA, PUNJAB**

**2024**

**Declaration by the Student**

**To whom-so-ever it may concern**

I, **MD TARIQUE ANWER**, **322201297**, hereby declare that the work done by me on “**Real-Time Stock Analysis and Prediction Using Python and Yahoo Finance**”, is a record of original work for the partial fulfilment of the requirements for the award of the degree, **Master of Computer Application.**

**MD TARIQUE ANWER (322201297)**

Signature of the student

Dated:

# Acknowledgement

I would like to express my sincere gratitude to everyone who contributed to the successful completion of my project, "**Real-Time Stock Analysis and Prediction using Python and Yahoo Finance**".

First and foremost, I extend my deep appreciation to the faculty members of the **Online Master of Computer Application program at Lovely Professional University**. Their commitment to excellence in teaching and the comprehensive curriculum provided me with the essential knowledge, guidance, and resources required to complete this project. I am especially grateful to my instructors and mentors whose insightful feedback, expert advice, and constructive criticism were invaluable in refining my approach and methodology.

A special note of thanks goes to my family and friends for their unwavering support, understanding, and patience throughout this endeavour. Their belief in my abilities and their constant motivation were sources of inspiration that fuelled my determination to push through difficult moments and stay committed to my goals.

Completing this project has been a deeply enriching and educational journey. It has allowed me to apply theoretical concepts in a practical setting, sharpen my analytical and technical skills, and gain invaluable insights into real-time financial data analysis. I am truly grateful to everyone who contributed in any capacity to making this project a reality.

Thank you all for your support and encouragement.

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***Tarique Anwer***

**Abstract**

This project, “**Real-Time Stock Analysis and Prediction Using Python and Yahoo Finance**”, aims to assist investors in making informed decisions by providing timely insights into stock market trends. In today's fast-paced financial environment, analysing real-time stock data is crucial for individuals and organizations to stay ahead in investments. This project leverages Python for data extraction, processing, and visualization, using Yahoo Finance as the primary data source for live market data.

Our approach integrates data analysis and machine learning to predict short-term price movements and identify potential investment opportunities. Key tools and libraries used include pandas for data manipulation, Plotly for visualization, Flask for backend of web application and HTML, CSS and JavaScript as frontend technologies and various predictive models for forecasting stock prices. By analysing historical stock data and real-time trends, we generate insights on stock performance that can be used to predict future price movements.

Through this project, we demonstrate a practical application of machine learning in finance, highlighting the use of web scraping, data analysis, and predictive modeling to support investment decisions. This report details the methodologies, tools, and outcomes, providing a comprehensive view of how Python can be used to deliver robust stock analysis and predictive insights for real-time decision-making in the stock market.

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**List of Symbols**

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Description** | **Unit** |
| $ | Stock Price | USD |

**List of Abbreviations**

|  |  |  |
| --- | --- | --- |
| **Abbreviation** | **Full Form** | **Description** |
| ML | Machine Learning | USD |
| API | Application Programming Interface | 2 |
| INR | Indian Rupees | 3 |
| NLP | Natural Language Processing | 4 |

# Chapter-1 Introduction

The project, **“Real-Time Stock Analysis and Prediction Using Python and Yahoo Finance”,** is designed to provide investors with accurate, data-driven insights into stock market performance. This project retrieves both historical and real-time stock data from Yahoo Finance using web scraping techniques, with an alternative option to use the YFinance API if web scraping becomes unavailable.

By integrating machine learning techniques and leveraging key Python libraries—such as **Pandas** for efficient data manipulation, **NumPy** for complex numerical computations, and **Plotly** for data visualization—this project transforms raw market data into actionable insights. The primary objective is to predict future stock trends, empowering investors to make informed decisions about which stocks to buy. Through real-time analysis and forecasting, this project demonstrates the potential of Python in financial analytics, offering a robust tool for stock prediction and decision-making.

# 1.1 Overview of the Project

**“The Real-Time Stock Analysis and Prediction Using Python and Yahoo Finance”** project is designed to empower investors with data-driven insights into stock performance, using a combination of real-time and historical data from Yahoo Finance. By extracting and analyzing this data, the project provides a basis for predicting stock trends and informing investment decisions.

**Data Retrieval and Processing**

Data is sourced from Yahoo Finance through web scraping techniques, or alternatively through the YFinance API if web scraping becomes inaccessible. This dual approach ensures a reliable and continuous flow of market data for analysis. Key libraries such as Pandas and NumPy play a central role in structuring, cleaning, and manipulating the data, transforming raw inputs into meaningful insights.

**Analytical Approach and Machine Learning**

Using Python’s extensive data science ecosystem, the project explores historical stock prices to identify patterns and predict future stock performance. Various machine learning models are applied to this dataset, aiming to predict short-term stock price movements based on historical trends and market behavior. This predictive modeling enables a comparative analysis of stocks, identifying those with promising trends for potential investments.

**Visualization and User Insights**

Data visualization is achieved through the Matplotlib library, providing graphical insights that help investors quickly understand trends and patterns. By combining real-time data analysis with predictive analytics, the project delivers a user-friendly platform where users can visualize potential stock movements and make informed investment decisions.

**Goal and Significance**

The primary objective of this project is to enable informed, data-driven decision-making for investors looking to maximize returns. By providing an accessible, Python-based solution for stock analysis and prediction, the project serves as a practical tool for anyone interested in leveraging real-time financial data to anticipate market movements. This project not only demonstrates the application of Python in financial analytics but also showcases the role of machine learning in shaping modern investment strategies.