Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds

A report submitted to the Mahatma Gandhi Central University

In partial fulfilment of the requirements

for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE & ENGINEERING

BY

AKANKSHA

(ENROLLMENT NO. MGCU2020CSIT3002)

&

MUKUL ANAND

(ENROLLMENT NO. MGCU2020CSIT3014)

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

MAHATMA GANDHI CENTRAL UNIVERSITY, MOTIHARI

BIHAR-845401, INDIA

APRIL - 2024

Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds

A report submitted to the Mahatma Gandhi Central University

In partial fulfilment of the requirements

for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE & ENGINEERING

BY

AKANKSHA

(ENROLLMENT NO. MGCU2020CSIT3002)

&

MUKUL ANAND

(ENROLLMENT NO. MGCU2020CSIT3014)

Under the Supervision of

Prof. Vikas Pareek

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

MAHATMA GANDHI CENTRAL UNIVERSITY, MOTIHARI

BIHAR - 845401, INDIA

APRIL - 2024

कंप्यूटर विज्ञान और सूचना प्रौद्योगिकी विभाग
Department of Computer Science and Information Technology
महात्मा गाँधी केन्द्रीय विश्वविद्यालय
MAHATMA GANDHI CENTRAL UNIVERSITY
बिहार/Bihar-845401

DECLARATION

This is to certify that the project report titled **"Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds"** is being submitted to the **Department of Computer Science and Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India,** in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science & Engineering**, is a record of bonafide work carried out by Akanksha (MGCU2020CSIT3002) and Mukul Anand (MGCU2020CSIT3014) under the supervision of **"Prof. Vikas Pareek"**.

The matter embodied in the project report has not been submitted in part or full toany University or Institution for the award of any other degree or diploma.

During the preparation of this work, I have not used any AI-based tool to write any part of this project report. I take full responsibility for the submitted content including similarity.

Akanksha
Enrolment No.: MGCU2019CSIT3002
Department of Computer Science and Information Technology,
Mahatma Gandhi Central University,
Motihari, Bihar - 845401, India
Email ID:
mgcu2020csit3002@mgcub.ac.in

Mukul Anand
Enrolment No.: MGCU2019CSIT3014
Department of Computer Science and Information Technology,
Mahatma Gandhi Central University,
Motihari, Bihar - 845401, India
Email ID:
mgcu2020csit3014@mgcub.ac.in

कंप्यूटर विज्ञान और सूचना प्रौद्योगिकी विभाग
Department of Computer Science and Information Technology
महात्मा गाँधी केन्द्रीय विश्वविद्यालय
MAHATMA GANDHI CENTRAL UNIVERSITY
बिहार/Bihar-845401

CERTIFICATE

This is to certify that this project entitled **"Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds"** submitted by Akanksha (MGCU2020CSIT3002) and Mukul Anand (MGCU2020CSIT3014)**,** to the Department of Computer Science & Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India, for the award of the degree of **Bachelor of Technology** in **Computer Science & Engineering**, is a project work carried out by them under the supervision of **the undersigned.**

19/04/24

Date:- 12/04/2024

Head of the Department & Supervisor
Prof. Vikas Pareek
Department of Computer Science and Information Technology
Mahatma Gandhi Central University,
Motihari, Bihar - 845401, India
Email ID:
vikaspareek@mgcub.ac.in

Acknowledgements

"Gratefulness is innate to Acknowledgement"

This Project is the result of an enriching yet challenging journey, which has become possible because a plenty of people have contributed and given their support. This formal piece of acknowledgment is an attempt to express the feeling of gratitude towards them as the Project wouldn't have been successfully completed without their co-operation. We would like to express heartfelt gratitude to Prof. Vikas Pareek, our supervisor, for his guidance, supervision, insights, and counselling. He has been there with his unyielding support and valuable suggestions throughout the Project. A special thanks to our hon'ble Vice Chancellor Prof. Sanjay Srivastava, my academic Dean Prof. Ranjeet Kumar Choudhary, Head of the department Prof. Vikas Pareek, and all the professors of my department for their support. We would also like to appreciate and acknowledge the efforts of all the friends whose response, coordination and time was of utmost importance for the project. Above all, no words can express our feelings towards our parents and classmates who supported us directly or indirectly during our project. We sincerely thank and are grateful to the core to all the respondents whose cooperation and support have helped us a lot in collecting the necessary information.

Akanksha
Enrolment No.: MGCU2019CSIT3002
Department of Computer Science and Information Technology,
Mahatma Gandhi Central University,
Motihari, Bihar - 845401, India
Email ID: mgcu2020csit3002@mgcub.ac.in

Mukul Anand
Enrolment No.: MGCU2019CSIT3014
Department of Computer Science and Information Technology,
Mahatma Gandhi Central University,
Motihari, Bihar - 845401, India
Email ID: mgcu2020csit3014@mgcub.ac.in

Abstract

Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds

In today's fast-paced financial landscape, access to real-time data is paramount for investors to make informed decisions. However, the current market lacks a centralized platform that can provide instantaneous updates on mutual fund prices, leading to inefficiencies and time-consuming processes. In response to this need, our project introduces “Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds” designed to empower investors with effortless monitoring of mutual fund market prices.

"Mutual Funds Monitor" revolutionizes the investment experience by offering users a seamless solution to track the real-time market prices of mutual funds. With a simple input of the mutual fund's link, users gain instant access to up-to-date prices, eliminating the hassle of manual searches across various platforms. Leveraging state-of-the-art technology and user-friendly design principles, " Mutual Funds Monitor" redefines the investor's interaction with their mutual fund investments.

By providing a centralized hub for real-time market price monitoring, "Mutual Funds Monitor" enhances transparency and accessibility within the financial ecosystem. It democratizes critical investment information, enabling investors of all levels to make informed decisions and manage their portfolios proactively. With "Mutual Funds Monitor", investors can take control of their financial futures with confidence and agility.

In conclusion, "Mutual Funds Monitor" represents a significant advancement in financial technology, offering a transformative solution to the challenges faced by investors in monitoring mutual fund investments. With its unparalleled convenience, accuracy, and accessibility, "Mutual Funds Monitor" sets a new standard for how investors engage with mutual funds in the digital age, fostering a paradigm shift towards intra-week investment strategies.

Keywords: Mutual Funds, Intra-Week, Real-Time Market Price Monitoring, Investment, Financial Technology, Transparency, Accessibility, Portfolio Management, Investor Empowerment, Digital Age, Innovation.

Table of Contents

List of Figures

1. Introduction

In today's fast-paced financial landscape, where markets fluctuate in real-time and investment opportunities arise and fade within days or even hours, access to instantaneous data is paramount for investors seeking to optimize their portfolios. Yet, despite the advancements in financial technology, the realm of mutual fund investments has often been characterized by fragmented information sources and cumbersome processes, hindering investors' ability to make decisions timely and in an informed manner.

In response to this pressing need, our project introduces "Mutual Funds Monitor: Revolutionizing Investment with Real-Time Monitoring of Your Funds" designed to revolutionize how investors monitor and engage with mutual fund investments. With the vision of empowering investors to embrace intra-week investment strategies, "Mutual Funds Monitor" aims to disrupt the traditional approach to mutual fund investment by providing users with a seamless solution for tracking real-time market prices.

By leveraging cutting-edge technology and user-centric design principles, "Mutual Funds Monitor" offers users a simple and intuitive interface to access up-to-date prices of mutual funds with unprecedented ease. The platform eliminates the need for manual searches across multiple platforms, allowing investors to stay informed and agile in their decision-making, even in the midst of rapidly changing market conditions.

Central to the vision of "Mutual Funds Monitor" is the democratization of investment information and the promotion of intra-week investment strategies. By providing a centralized hub for real-time market price monitoring, the platform aims to enhance transparency and accessibility within the financial ecosystem, empowering investors to seize opportunities and manage their portfolios proactively throughout the week.

In conclusion, "Mutual Funds Monitor" represents a paradigm shift in financial technology, offering a transformative solution to the challenges faced by investors in monitoring mutual fund investments. With its unparalleled convenience, accuracy, and vision for intra-week investment strategies, "Mutual Funds Monitor" sets a new standard for how investors engage with mutual funds in the digital age, ushering in a new era of dynamic and proactive portfolio management.

1.1. Purpose of the Project

The purpose of this project is to address the inherent challenges faced by investors in monitoring and managing their mutual fund investments in today's fast-paced financial landscape. With the proliferation of digital platforms and the increasing complexity of investment options, there exists a critical need for a centralized solution that can provide real-time updates on mutual fund prices. By introducing "Mutual Funds Monitor," our aim is to revolutionize the investor experience by offering a seamless and efficient platform for tracking market prices of mutual funds. Through this project, we seek to empower investors with the tools and information they need to make informed decisions, embrace intra-week investment strategies, and take control of their financial futures with confidence and agility.

1.2. Objectives

The primary objective of this project is to develop and implement "Mutual Funds Monitor," a user-friendly platform that enables investors to track real-time market prices of mutual funds effortlessly, with focussing particularly on facilitating intra-week investment strategies. Specifically, our objectives include*:*

1.2.1 Designing an intuitive and user-friendly interface that allows users to input mutual fund links and instantly access up-to-date market prices, facilitating intra-week monitoring.

1.2.2 Leveraging state-of-the-art technology to ensure accuracy and reliability in the real-time data provided to users, enabling them to make informed decisions throughout the week.

1.2.3 Enhancing transparency and accessibility within the financial ecosystem by democratizing critical investment information, particularly in the context of intra-week fluctuations.

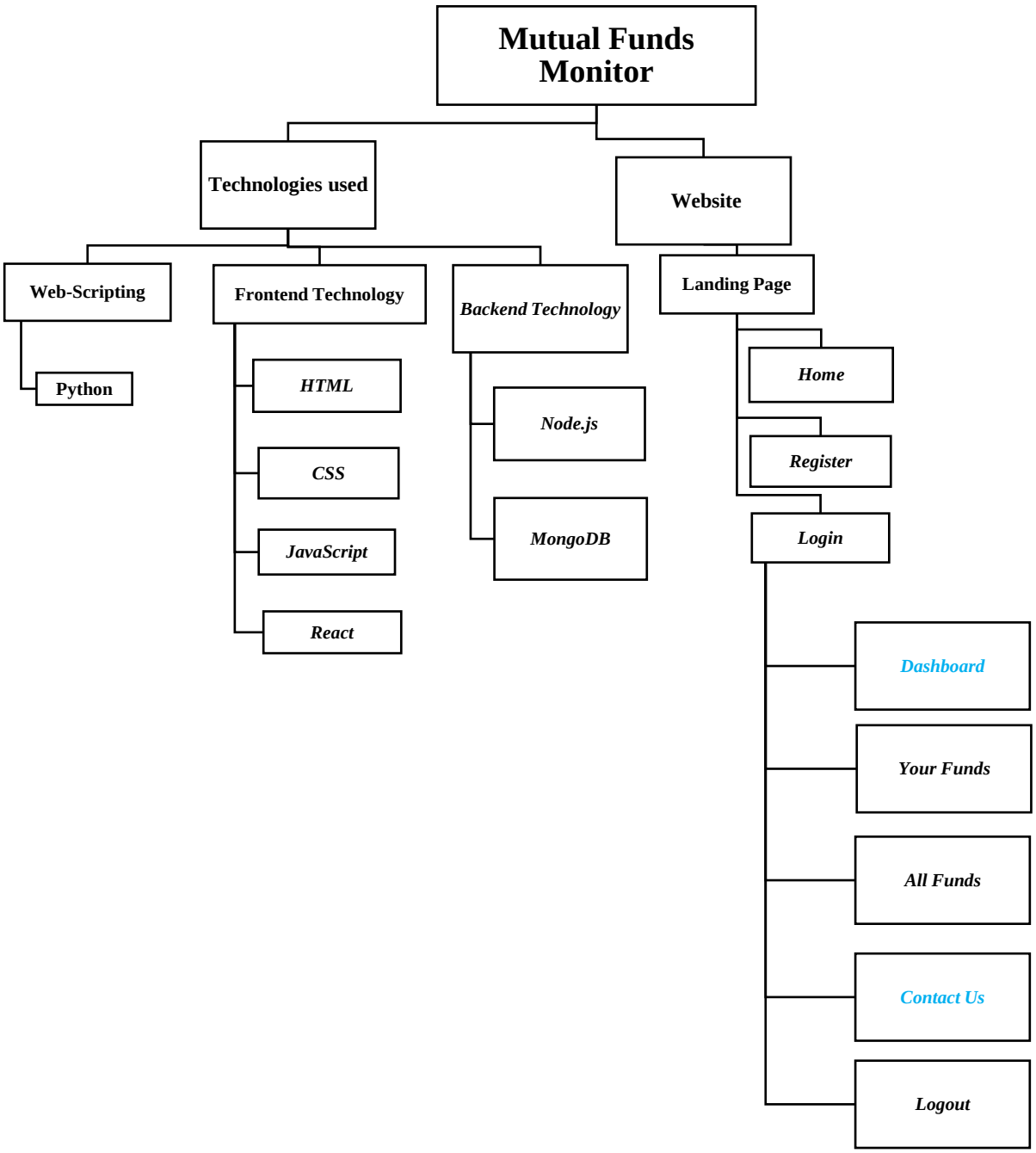
1.2.4 Empowering investors of all levels to proactively manage their portfolios and seize opportunities presented by intra-week market movements, thereby maximizing investment returns.

1.2.5 Setting a new standard for how investors engage with mutual funds in the digital age by fostering a culture of dynamic and agile portfolio management, with a focus on intra-week strategies.

Through the achievement of these objectives, we aim to provide investors with a transformative solution to the challenges associated with monitoring mutual fund

investments, specifically catering to the needs of those embracing intra-week investment strategies. This platform will empower investors to navigate the fast-paced financial markets with confidence and efficiency, enabling them to capitalize on opportunities as they arise throughout the week.

2. FLOWCHART



3. TECHNOLOGIES USED

3.1. Python:

The backbone of "Mutual Funds Monitor", Python powers the core functionality of our platform. Leveraging Python's versatility and extensive library ecosystem, we have developed an efficient and user-friendly solution for real-time market price monitoring of mutual funds. Python's robustness enables seamless integration with various data sources, ensuring accurate and up-to-date information for investors. Additionally, Python facilitates rapid prototyping and iteration, allowing us to continually enhance and optimize Mutual Funds Monitor to meet the evolving needs of our users.

3.2. Google Colab:

Our project harnesses the power of Google Colab, a cloud-based platform that provides free access to computational resources for Python programming. Google Colab enables seamless collaboration and sharing of code and notebooks, allowing our team to work together efficiently on developing and implementing Mutual Funds Monitor. With its integration with Google Drive and built-in support for popular Python libraries such as TensorFlow and pandas, Google Colab facilitates rapid development and prototyping of our real-time market price monitoring platform for mutual funds.

3.3. VS Code:

Visual Studio Code serves as the primary integrated development environment (IDE) for our project. Developed by Microsoft, VS Code offers a highly customizable and feature-rich environment for coding, debugging, and project management. Our team utilizes VS Code for writing, editing, and organizing codebase components of Mutual Funds Monitor. With its robust extension ecosystem and support for various programming languages, VS Code streamlines our development process, enhancing productivity and collaboration among team members.

3.4. Node:

Node.js is an integral part of our project infrastructure, serving as the runtime environment for server-side code execution. Leveraging the asynchronous event-driven architecture of Node.js, we develop scalable and high-performance server applications for Mutual Funds Monitor. Node.js enables us to handle concurrent requests efficiently, ensuring seamless real-time updates and interactions on our platform. With its vast ecosystem of modules and libraries, Node.js empowers us to build robust and responsive

server-side functionalities, enhancing the overall performance and user experience of Mutual Funds Monitor.

3.5. HTML (Hyper Text Markup Language):

HTML forms the backbone of the front-end structure of Mutual Funds Monitor. As the standard markup language for creating web pages, HTML enables us to define the structure and content of our platform's user interface. With its simple and intuitive syntax, HTML allows us to create semantic and accessible web pages, ensuring compatibility across different devices and browsers. By leveraging HTML alongside CSS and JavaScript, we deliver a visually appealing and user-friendly experience for investors accessing Mutual Funds Monitor through web browsers.

3.6. CSS (Cascading Style Sheets):

CSS plays a crucial role in shaping the visual presentation and user interface of Mutual Funds Monitor. By applying CSS styles to HTML elements, we achieve consistent and appealing layouts across our platform. CSS enables us to customize the appearance of text, colors, fonts, and layout properties, ensuring a cohesive and aesthetically pleasing user experience. With its flexibility and powerful styling capabilities, CSS allows us to create responsive and visually engaging interfaces that enhance usability and accessibility for investors interacting with Mutual Funds Monitor.

3.7. JavaScript:

JavaScript serves as the backbone of the interactive functionalities and dynamic behaviour of Mutual Funds Monitor. As a versatile programming language, JavaScript enables us to add interactivity and responsiveness to our platform's user interface. We utilize JavaScript to implement real-time updates, handle user interactions, and perform client-side validation. JavaScript empowers us to create rich and seamless user experiences for investors accessing Mutual Funds Monitor across various devices and browsers.

3.8. MongoDB:

MongoDB serves as the primary database management system for Mutual Funds Monitor. As a NoSQL database, MongoDB offers flexibility and scalability for storing and managing large volumes of data efficiently. We leverage MongoDB's document-oriented architecture to store and retrieve data related to mutual funds, user profiles, and

transaction history. With its support for flexible schemas and distributed data storage, MongoDB enables us to adapt to evolving data requirements and scale our platform seamlessly as our user base grows. By leveraging MongoDB alongside Node.js, we create a robust and scalable backend infrastructure for Mutual Funds Monitor, ensuring optimal performance and reliability for our users.

4. Mention of Ongoing Progress

4.1. Data Integration and Retrieval:

The foundation of our "Mutual Funds Monitor" project is the smooth integration and retrieval of data from multiple reliable sources, including Groww, Google Finance, and the official websites of stock exchanges like NSE and BSE. This is a very important factor because timely and accurate data has a direct bearing on investment decisions.

We use a complex blend of web scraping in our data retrieval procedure. Structured data access is made possible by APIs, which provide consistency and dependability. But not all necessary data is always accessible via APIs. Because of this, we use web scraping to obtain more data from official websites, guaranteeing thorough coverage of mutual fund information. There are several obstacles in the way of this project, such as maintaining data integrity between sources, working around API restrictions, and mastering the nuances of web scraping, such managing dynamic material and respecting rules of service on websites. All the same, we work hard to give users a solid and trustworthy source of information for their investment decisions through careful design and ongoing improvement of our data retrieval mechanisms.

4.2. Algorithm Development:

The creation of the algorithm is a critical component of our project since it allows us to accurately calculate mutual fund values in real time. This procedure uses our Python codebase to perform computations in real-time while utilizing data that has been retrieved from numerous trustworthy online sources. In order to commence the process of developing the algorithm, we collect large datasets from reliable sources like Groww, Google Finance, and the official websites of stock exchanges like NSE and BSE. These statistics include market indexes, historical prices, fund performance indicators, and other relevant factors, among a wealth of other information. We have worked on developing a strategy that can interpret the data in real-time and precisely determine the current mutual fund values after it has been gathered. For these computations, we use a

combination of mathematical formulas, financial concepts, and programming logic. Mutual fund pricing is influenced by a number of factors, including market trends, fund management fees, transaction expenses, and net asset value (NAV). These elements are all taken into account during our internal computations. We ensure that the calculated prices accurately reflect the mutual fund's genuine value at any given time by integrating these aspects into our methodology.

We give accuracy, dependability, and computational efficiency top priority during the algorithm development process. To help people understand how prices are set and have confidence in the veracity of the information given, we have tried to make sure that the underlying logic and computations are apparent to them. To put it briefly, we are using information retrieved from online sources, to precisely compute mutual fund prices in the present. We want to equip investors with the knowledge they need to make wise investment decisions instantly by placing a high priority on accuracy, dependability, and transparency.

4.3. User Interface:

Our project's user interface (UI) acts as a portal for investors to easily access and engage with real-time mutual fund pricing information. To guarantee a flawless user experience, our UI design is a representative of utility, simplicity, and intuitiveness. Users are welcomed to our site by a clear and user-friendly layout that makes it simple to navigate and quickly access key functions. The layout has been meticulously designed to minimize clutter and distractions while presenting information in an understandable and well-organized manner.

4.3.1. Key Features:

4.3.1.1. User authentication:

Users may simply create accounts or log in to access their investment portfolios and real-time pricing information of their Mutual Funds. This is made possible via a secure login method.

4.3.1.2. Portfolio Input:

Users can easily input the details or link to their mutual fund investment portfolios using a simple and intuitive interface. By using this feature, customers may monitor the success of their portfolio in real time and simplify the process of tracking several investments.

4.3.1.3. Real-Time Mutual Fund Price Tracking:

Our user interface's main feature, which gives consumers fast access to information on the current prices of the mutual funds they invest in, is our real-time price tracking function. Individual funds and complete portfolios can be viewed, along with comprehensive price details including NAV (Net Asset Value) and performance indicators.

4.3.1.4. Responsive UI:

Our UI is designed to be responsive and adaptable to various devices and screen sizes, ensuring a consistent and optimized experience across desktops, laptops, tablets, and smartphones.

4.4. Portfolio Integration:

A portfolio refers to a collection of financial assets owned by an individual or entity, such as stocks, bonds, and mutual funds. Using our platform, users may combine different mutual fund holdings into a single, consolidated view in order to establish and manage their investment portfolios. Each fund in the user's portfolio has comprehensive information available, including NAV and performance data. One important statistic for assessing the success of mutual funds is net asset value, or NAV. It shows the per share market value of a mutual fund's assets minus its liabilities. In order to give customers accurate and current price information, NAV is updated on a regular basis to take into account changes in the market and fund performance. A crucial aspect of our platform is portfolio integration, which enables customers to easily monitor the current prices of the mutual funds they have invested in. Users can make well-informed investment decisions by easily integrating their investment portfolios into our platform. With the help of this tool, users can input information about their investment portfolio or give a link to it. Our system then processes this information to deliver real-time updates on fund pricing and performance measures.
Validating and normalizing data as well as processing workflows are part of the technical implementation of portfolio integration, which guarantees compatibility with different portfolio formats and data sources. Upon integration, our software automatically retrieves and updates the mutual fund prices that are part of the user's portfolio.

4.5. Performance Optimization:

A major part of our continuous development is system performance optimization as we work to improve responsiveness and user experience. In order to guarantee that users receive timely updates on the current status of their mutual fund investments, performance optimization seeks to lower latency and increase overall system efficiency. Our code initially required 55 seconds to retrieve and show the user the current status of a fund. We have successfully lowered this processing time to roughly 30 seconds through intensive optimization efforts. This optimization was made possible by finding and fixing inefficiencies throughout our system, especially in places where pointless computations were being done. One key optimization strategy involved minimizing the repetition of calculations by implementing caching mechanisms. By storing the results of expensive computations and reusing them when needed, we were able to significantly reduce the computational overhead, ultimately speeding up the process of generating real-time updates for users.

Furthermore, we encountered inconsistencies in the names of companies fetched from various sources, including those obtained from portfolio links of mutual funds. These inconsistencies stemmed from differences in case sensitivity and the presence of special symbols in company names. To address this issue, we implemented data cleaning procedures to standardize company names across the system.

Data cleaning involved removing special characters, standardizing capitalization, and resolving case sensitivity issues. This ensured consistency in the representation of company names, thereby improving the accuracy of data processing and enhancing the overall reliability of our system.

In summary, our ongoing progress encompasses continuous improvements in data integration, algorithm development, user interface enhancements, portfolio integration and performance optimization. By staying committed to these principles, we strive to provide investors with a comprehensive and user-friendly platform for tracking and managing their mutual fund investments in real-time, thereby facilitating informed decision-making and financial empowerment.

5. System Requirements:

5.1. Frontend (Desktop, Laptop, Mobile Phones):

- **Description**: The frontend is responsible for presenting the user interface to the end-users and facilitating interaction with the application.

- **Components**: HTML, CSS, JavaScript, and frameworks like React.js for dynamic frontend development.
- **Deployment**: Frontend files can be hosted on a web server or served directly from the backend server.

5.2. Backend (Desktop, Laptop, Mobile Phones):

- **Description**: The backend serves as the core processing unit of the application, handling business logic, data retrieval, and serving API endpoints.
- **Components**: Built using Python for Web Scraping, Node.js framework, which provides a lightweight and scalable solution for building web applications.
- **Deployment**: Backend services can be deployed in future on a cloud platform (e.g., AWS, Azure, Google Cloud) or on-premises servers.

5.3. Database:

- **Description**: The database stores and manages application data, including user information, mutual fund details associated with any particular user.
- **Components**: Utilize MongoDB with React.js and Node.js applications.
- **Deployment**: Database instances can be provisioned on cloud-based database services or installed on dedicated servers.

5.4. Python IDE:

- **Description:** Python Integrated Development Environment (IDE) is used for writing, debugging, and testing Python code of Web Scraping.
- **Components**: PyCharm, Anaconda, or any other Python IDE that supports Python 3.7 or later.
- **Usage**: Developers utilize the Python IDE to write and debug Web Scraping code, ensuring code quality and functionality.

5.5. Operating System:

- **Description**: The operating system provides the foundational software environment for running the application and its components.
- **Options:** Android or Windows operating systems are suitable for running both frontend and backend components.
- **Description**: Deploy the application using a combination of cloud-based and on-premises infrastructure to ensure scalability, reliability, and availability.

6. Foundational Concepts and Market Overview:

To start with, Mutual funds serve as the popular investment vehicle, which pools the money of multiple participants to buy a variety of securities, including stocks, bonds, and other assets. Mutual funds provide people with access to a variety of investment options with different risk profiles, all under the expert management of fund managers. Prominent websites like Groww

and Google Finance give investors access to financial tools, market data, and educational materials. To obtain comprehensive details including the current price, market size, trading volume, and past performance, investors can search for individual stocks. Users can evaluate changes in stock prices over various time periods and assess how their performance stacks up against peers or benchmarks through interactive charts. There is term called portfolio, an individual or an entity's collection of investments is referred to as a **portfolio**. Investing in various financial instruments, including stocks, bonds, mutual funds, and even cash equivalents like certificates of deposit (CDs) or savings accounts, is similar to putting money in a basket. Spreading your investments over a variety of assets is the objective of a portfolio, which is to lower risk. It is hoped that if one investment does not perform well, the others will help to offset the loss. In order to manage a portfolio, you must select the appropriate combination of investments depending on your time horizon, risk tolerance, and financial objectives. Traditionally, once a day, generally after the market closes, the Net Asset Value (NAV), which represents the price of mutual funds, is updated. By dividing the total asset value by the number of outstanding shares, the net asset value (NAV) of the fund represents its worth per share. For investors, however, who need up-to-date information to make wise investment decisions, this delay in NAV updates poses difficulties. This is where our Project comes in to address the gap and provide a solution.

There is one more gap which is being filled through our Project, let's look at the pictures of a particular "Aditya Birla SunLife PSU Equity Direct Fund Growth" MF (from several websites)below to understand the same.

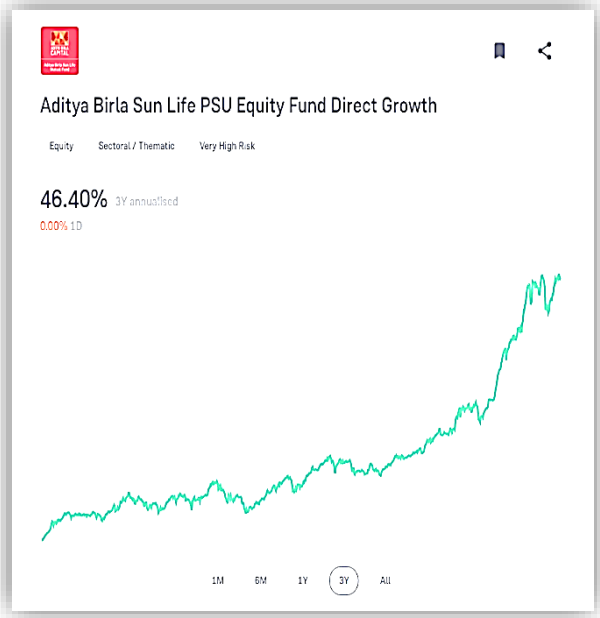


Figure 1: On the "Groww" website

Figure 2: On "Coin" website

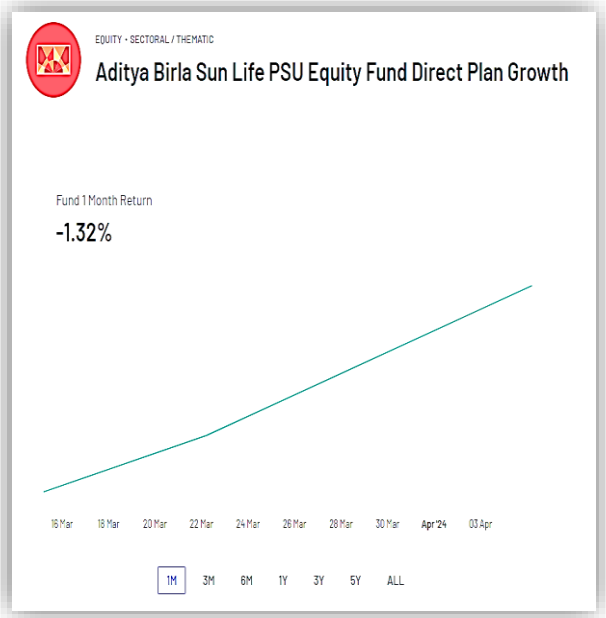


Figure 3: On "AngelOne"

Figure 4: on "Google Finance"

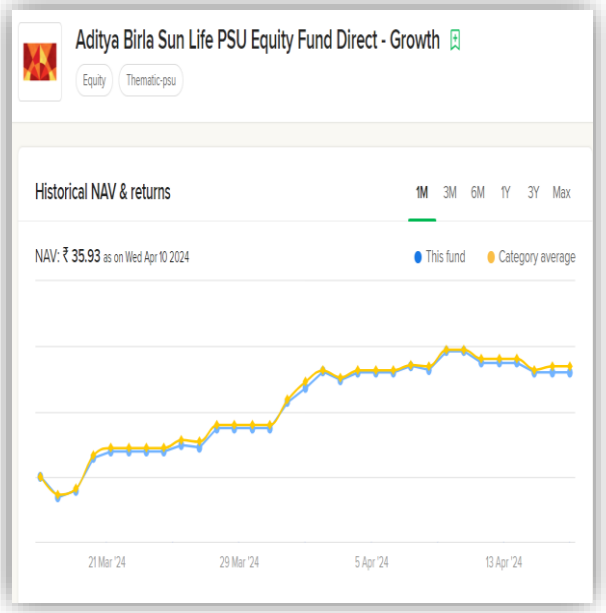


Figure 5: On "ET Money"

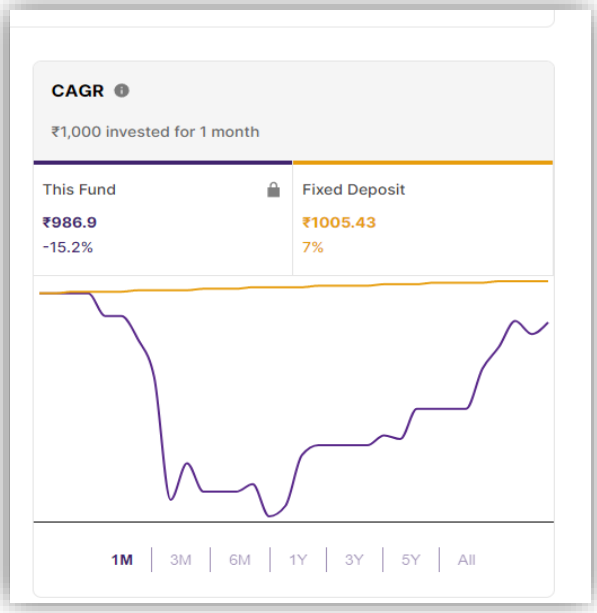


Figure 6: On the "Upstox"

It should be noted that charts sourced from official sites such as Groww, Google Finance, Upstox, Coin, and AngelOne primarily show patterns over a minimum of one month. Although these illustrations provide insightful information about the performance of mutual funds over longer timeframes, investors who want to monitor intra-week investment opportunities will find them inadequate. Significant obstacles stand in the way of investors hoping to profit from shorter-term trends or make quick portfolio modifications depending on current market conditions. This is where our Project turns out to be a saviour and endeavours to bridge this gap by this revolutionary approach of tracking funds every second wherein it will be possible to gain such granular insights.

7. Summary of Work Completed During the 7th Semester:

This semester, through our Project “Mutual Funds Monitor”, we have tried to develop a system that will completely change the way investors use Mutual Funds. Acknowledging the shortcomings of conventional end-of-day price reports, we set out to offer instantaneous insights on fund changes. Using information from reliable sources like Groww and Google Finance, we have created a robust Python-based system capable of calculating mutual fund prices at every moment. With the ability to make decisions immediately, investors may now get real-time information about the success of their investments, doing away with the need to wait for updates on a regular basis. In addition, we increased the project's scope by adding information from 5000+ companies that we are extracting from the NSE and BSE's official websites. This extensive dataset enhances the platform by providing users with a thorough overview of the market scenario. We have created an easy-to-use interface. Our goal was to continuously improve during the semester, paying close attention to code optimizations. We have improved the platform's performance and stability by fixing data discrepancies and optimizing algorithms, guaranteeing a flawless user experience.

We have worked diligently to ensure the security of user data, implementing robust encryption protocols and rigorous security measures to safeguard sensitive information. Furthermore, we have prioritized user feedback, incorporating suggestions and features requested by our community to tailor the platform to their needs. Through rigorous testing and quality assurance procedures, we have ensured that our platform meets the highest standards of reliability and usability. As we look to the future, we are committed to further enhancing our platform with advanced analytics and predictive modelling capabilities, empowering investors to make informed decisions with confidence. In conclusion, the project's progress toward democratizing investment access and equipping users with real-time financial insights reached a major turning point during the seventh semester. We are devoted to fostering innovation and providing investors with real returns as I work to improve and optimize the platform.

Additionally, we are exploring the integration of artificial intelligence algorithms to enhance the accuracy and efficiency of our predictive analytics tools. By leveraging cutting-edge technologies, we aim to stay at the forefront of the financial services industry and deliver unparalleled value to our users. Through continuous research and development efforts, we are committed to pushing the boundaries of what is possible in the realm of investment technology. As we embark on this journey of innovation and growth, we invite investors to join us in shaping the future of finance and unlocking new opportunities for wealth creation.

7.1. Landing Page.

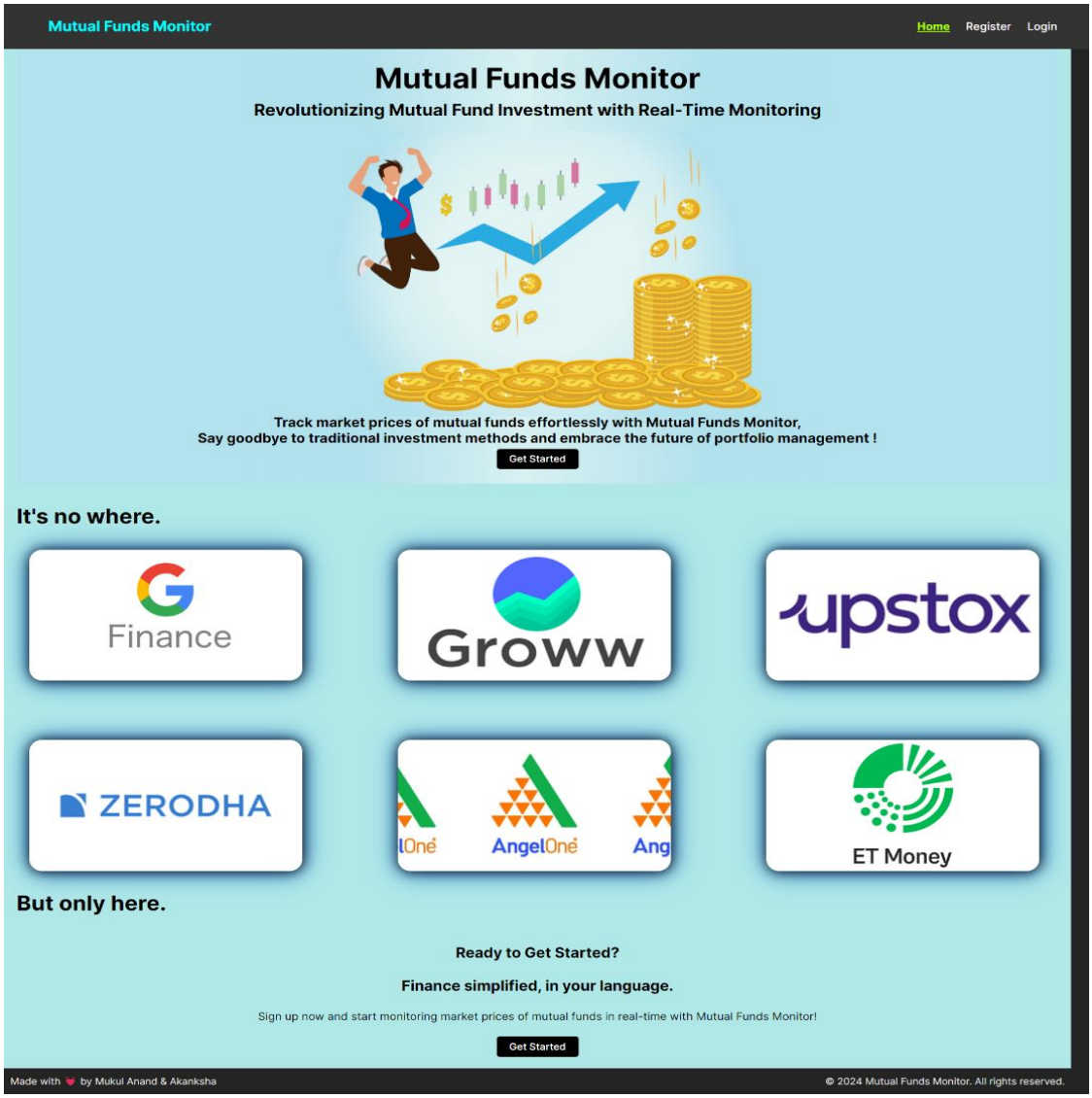


Figure 7:Landing page of our website..

7.2. Register page of our website.

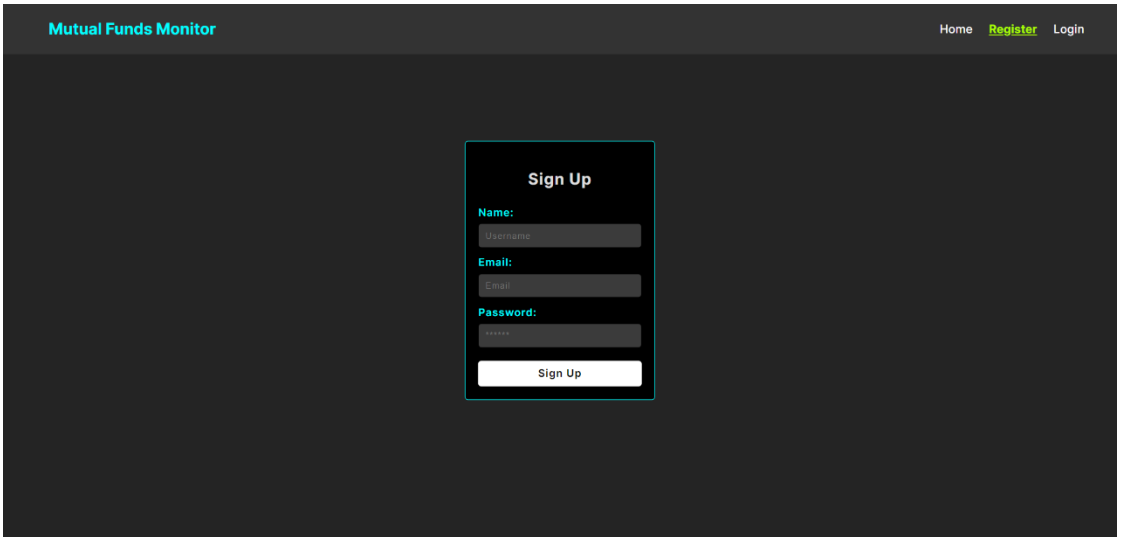


Figure 8:Register page of our website..

7.3. *Login Page of our website.*

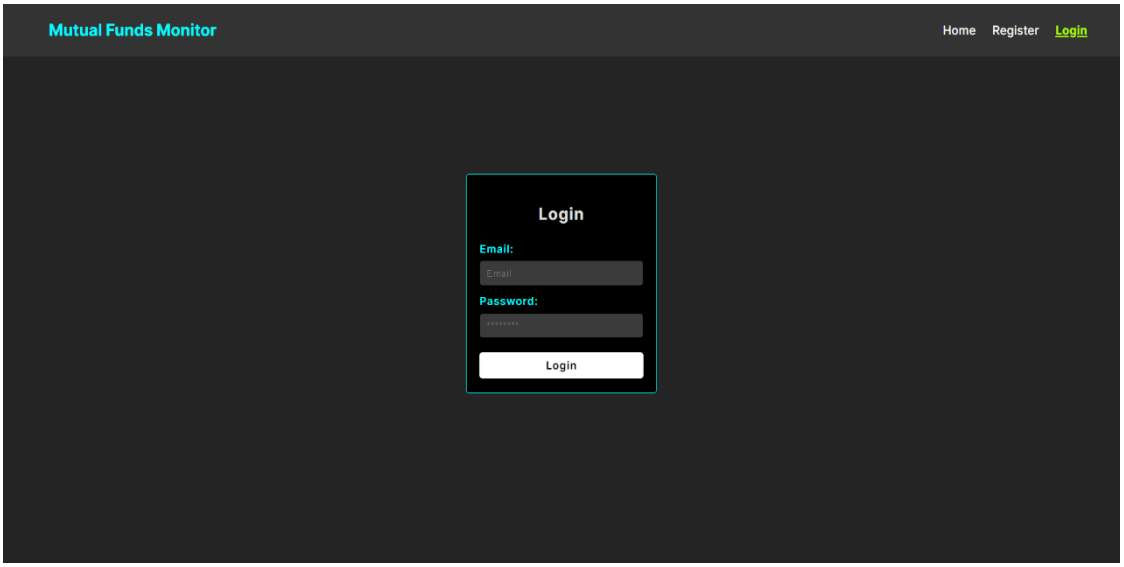


Figure 9: Login page of our website..

The login page serves as the gateway to a secure and personalized user experience on our platform. With ease of use and security in mind, it provides users with a simple method to access their accounts and enable a variety of features and activities. When users access the login page, they are asked to provide their credentials, which usually include a password and a username or email address.

This is how the Login Page of our Website shall look like:

- New User will have to sign-up.
- Already registered users may directly Login

7.3.1. *"Your Funds" Page*

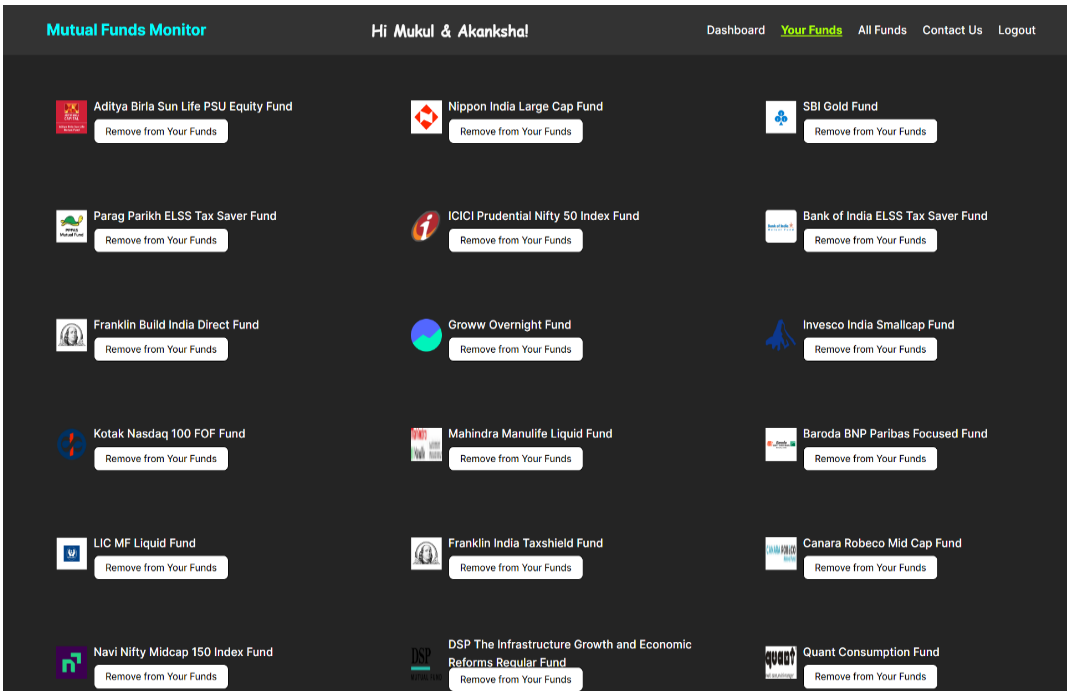
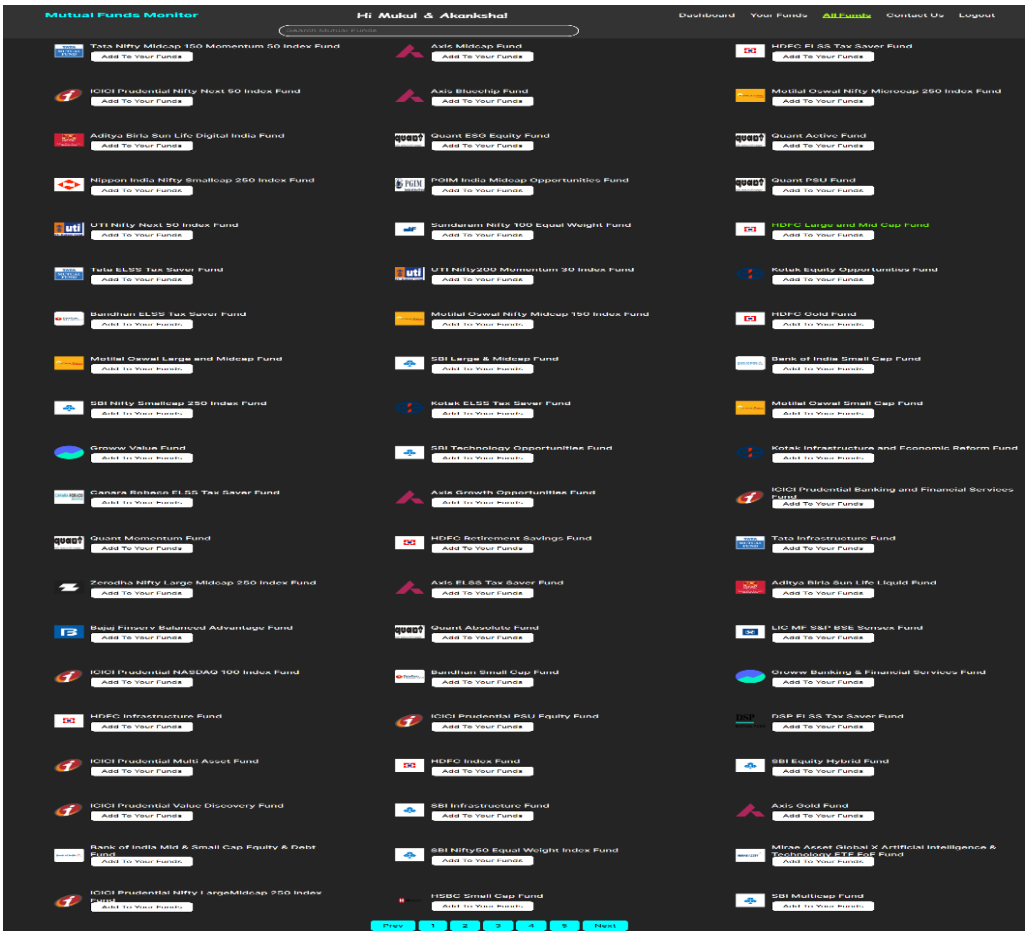


Figure 10: "Your Funds" page of our website..

7.3.2. *"All Funds" Page*



7.3.3. *NAV updated on the official website for Aditya Birla Sun Life PSU Equity Fund Direct Growth*

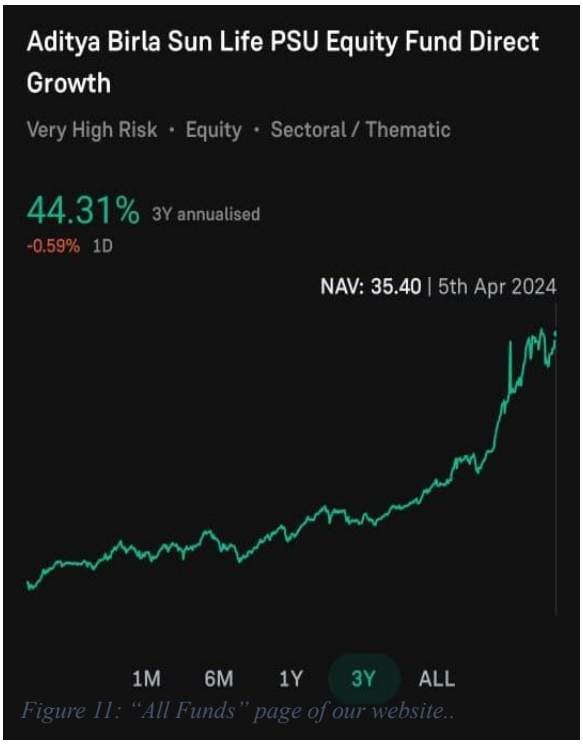


Figure 11: "All Funds" page of our website..

Figure 12: Official website's Screenshot for AB after 12am

7.3.4. *NAV calculated through our Programming Logic*

```
# To get value of MF at regular interval of time
# interval = 30
for i in range(2):
  current_nav = float(Last_day_closed) + ((float(Last_day_closed)*current_MF_
  # print(current_MF_status(stock_search_company_name))
  # print(current_nav)
  print(f"Last day NAV: {float(Last_day_closed):.2f}, Percentage increase: {(

  # time.sleep(interval)
```

```
Last day NAV: 35.21, Percentage increase: 0.63 % & Current NAV: 35.43
Last day NAV: 35.21, Percentage increase: 0.63 % & Current NAV: 35.43
```

Figure 13:: NAV at 3:30 pm for Aditya Birla Sun Life Fund Direct Growth

7.3.5. *NAV updated on the official website for SBI PSU Direct Plan Growth*

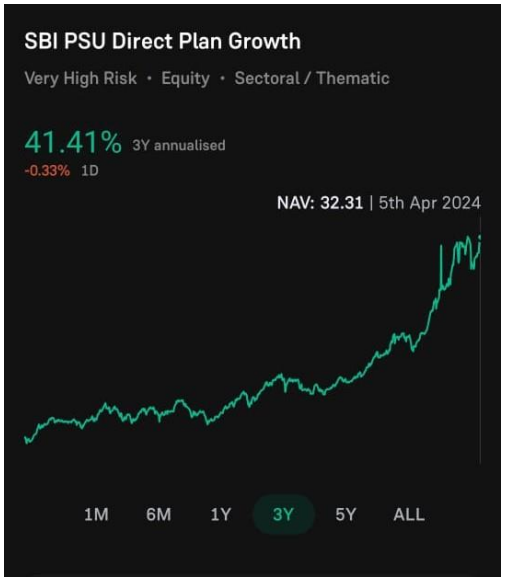


Figure 14: Official Website's screenshot for SBI after 12am

7.3.6. *NAV calculated through our Programming Logic for SBI*

```
# To get value of MF at regular interval of time
# interval = 30
for i in range(2):
  current_nav = float(Last_day_closed) + ((float(Last_day_closed)*current_M
  # print(current_MF_status(stock_search_company_name))
  # print(current_nav)
  print(f"Last day NAV: {float(Last_day_closed):.2f}, Percentage increase:

  # time.sleep(interval)
```

```
Last day NAV: 32.07, Percentage increase: 0.70 % & Current NAV: 32.30
Last day NAV: 32.07, Percentage increase: 0.70 % & Current NAV: 32.30
```

Figure 15: NAV shown at 3:30 pm through our Code at 3:30 pm

From the pictures inserted above, Aditya Birla Sun Life PSU Equity Fund Direct Growth (Figures 2 and 3) showing a NAV of 35.40 and SBI PSU Direct Plan Growth (Figures 4 and 5) with a NAV of 32.31 on 4th April at 3:30 pm which is the Market Closing time, of two mutual funds that are worth considering to illustrate the to-the-point calculation from our programming logic that showed these NAV values at 3:30 pm only, so the investors don't have to wait till mid-night to know the status of their invested funds. Through the use of our technology, investors will be able to monitor these funds' NAV values in real-time, enabling them to respond quickly to price changes on a daily basis.

We compare our estimated metrics with the official price updates after midnight to demonstrate the effectiveness of the project in providing precise and timely price calculations. Our approach is reliable and precise, as evident also by the consistency between our computations and the official statistics.

Look at the pictures inserted below to see how our ***Project is fulfilling its objective of strengthening intra-week investment strategies.***

7.3.7. Payment Confirmed for Quant Infra. Fund Direct Growth

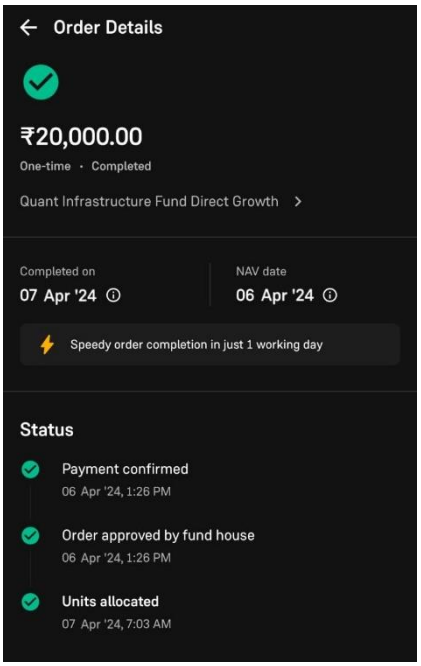


Figure 16: Order Placed for Quant Infra Fund Direct Growth on 6th April 2024

The image above depicts an order placed for the mutual fund "Quant Infrastructure Fund Direct Growth" on April 6th at 1:26 pm. This order was made based on the real-time status of the fund at that precise moment. The order has been placed such that NAV of same date is applicable on the Order even if the approval of the order (which may take from a min to 1-2hrs) takes a little more time. This agility in placing

orders is made possible by the instantaneous updates received, instilling confidence in investors and enabling swift decision-making. With access to real-time data, investors can act promptly and capitalize on favourable market conditions, ensuring that their orders reflect the most current information available.

7.3.8. Decision of redemption of Fund is backed by:

```
Quant Infrastructure Fund Direct Growth
Last day NAV: 43.41 , Percentage increase: 0.43 % & Current NAV: 43.60
```

Figure 17: NAV calculated by our code

Based on our real-time NAV calculation of Quant Infra. Fund Direct Growth using our code logic between approximately 2:00 PM to 2:20 PM, we observed a percentage increase of 0.43%. Considering that the market closing time is 3:30 PM, we anticipate that this fund will maintain a positive percentage increase by the end of the trading day.

Therefore, we have decided to proceed with placing a redemption order.

7.3.9. Order Redeemed on 10th April

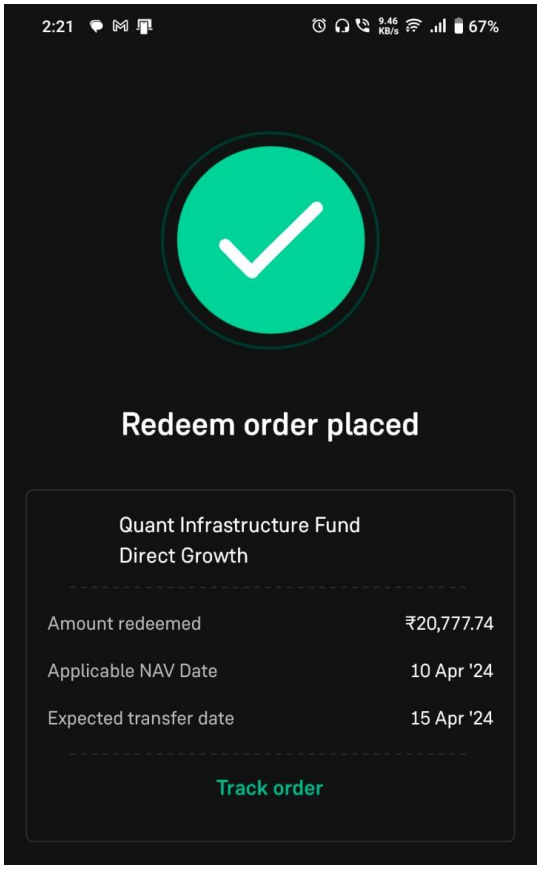


Figure 18: Order redeemed on 10th April 2024

In the image provided above, it's evident that within just 4 days, we've achieved a remarkable net profit of Rs. 777.74. The ability to make real-time calculations

has empowered us to make informed decisions regarding the buying and selling of mutual funds based on current market trends.

This newfound capability allows us to engage in intra-week investments with confidence, knowing that we have up-to-date information on the NAV (Net Asset Value) of our investments. Without this real-time insight, we would be left in uncertainty, risking potential losses or missing out on opportunities to maximize our profits. By staying informed about the metrics at every instant, we can navigate the market more effectively, optimizing our investment strategies and capitalizing on favourable trends. This not only enhances our financial outcomes but also instills a greater sense of control and confidence in our investment decisions.

8. Challenges and Lessons Learned

8.1. Reflection on Challenges Faced During Implementation

8.1.1. Web Scraping Challenges:

Identifying the specific class name to retrieve the data required from the front end of the official website was difficult. It took careful examination and testing to identify the correct class for extracting the relevant data due to variations in HTML structure and dynamic components.

8.1.2. Handling Multiple Mutual Funds:

The official website states that there are about 1450 mutual funds available, so it presented scalability issues to make sure our solution processed data for every fund efficiently. Effective retrieval techniques were put in place to guarantee users' easy access to fund information.

8.1.3. Data Consistency and formatting issues:

Inconsistencies in company names and portfolio formatting across different websites and sources presented challenges in data normalization and matching. Variations in case sensitivity and formatting required careful handling to ensure data integrity.

8.1.4. Integrating frontend with backend:

Our project's frontend and backend integration posed technical difficulties. The two levels needed to communicate and share data seamlessly, which required thorough testing and debugging.

8.1.5. Performance Improvement:

Our code's efficacy was first impacted by slower execution times. In order to overcome this difficulty, optimization strategies that increase code efficiency and decrease processing time were used.

8.1.6. Encryption and Data Fetching:

Some websites used encryption techniques that made it difficult to retrieve data and made it difficult to access and extract the necessary information.

8.2. Lessons Learned

8.2.1. Thorough Exploration and Testing:

We learned the importance of thorough exploration to accurately identify relevant HTML elements and ensure the effectiveness of web scraping techniques. Web scraping methods must be flexible to account for structural changes to websites.

8.2.2. Inclusion despite changes:

The system also needs to be flexible enough to incorporate new funds and updates seamlessly without compromising performance or data integrity.

8.2.3. Data retrieval:

Importance of understanding encryption methods and exploring alternative data retrieval approaches.

8.2.4. Importance of Optimization Strategies:

The key takeaway from improving our project's speed was to optimize code for shorter execution times and less unnecessary computations. We leveraged lists and dictionaries of Python data structures to store relevant information and for easy accessibility.

8.2.5. Perseverance and Resilience:

Last but not the least, in any project experience, resilience emerges as a fundamental lesson. It taught us to be resourceful, innovative, and flexible in our thinking, enabling us to navigate uncertainty and complexity with confidence and determination.

9. Conclusion

In conclusion, our product addresses a critical need for real-time mutual fund price tracking and provides investors with timely insights and actionable information, thus marking a significant leap in the financial technology space. Our solution, which we have developed by utilizing cutting-edge programming logic and creative design ideas, allows investors to

track mutual fund developments not only over longer timeframes but also on a daily and even second-by-second basis. We faced a number of difficulties over the project's journey, such as integration problems, data accuracy issues, and technological complexity. But by working well together, approaching problems strategically, and maintaining our focus on quality, we were able to overcome these obstacles and come up with a solid and trustworthy solution.

In addition, the project has taught us priceless lessons about the value of ongoing improvement, agile project management, and good communication. Accepting these lessons and using the knowledge we have received will make us more capable of addressing upcoming obstacles and promoting innovation in the constantly changing field of financial technology. As we move forward, we're still dedicated to improving and upgrading our solution, maximizing its effectiveness, and broadening its scope to satisfy investors' changing demands in the fast-paced market of today. Given our unwavering commitment to user-centric design, regulatory compliance, and scalability, we are optimistic that our project will continue to provide significant benefits and leave a lasting impression on the financial industry.

Our project is essentially an example of how technology can empower investors, democratize access to financial information, and spur constructive change in the financial sector. It is evidence of the commitment, creativity, and enthusiasm for innovation of our team, and we are thrilled about the benefits it will offer to investors across the globe.

10. Future Works

10.1. User Dashboard

Users will have a consolidated platform to access their investment portfolio, track performance, and keep an eye on market trends with the implementation of a user dashboard. The dashboard interface will display relevant information such as investment portfolio performance, asset allocation, and market trends. Integration of our real-time calculation engine will ensure that users have access to accurate and up-to-date data. Seamless integration with our backend systems will enable efficient data fetching and presentation, ensuring a smooth and responsive user experience. To improve user experience and support well-informed decision-making, the dashboard will include configurable features including personalized insights and notifications.

10.2. Risk Management

Those who integrate risk management tools into their investment portfolio will be able to evaluate and reduce any dangers. The system will utilize sophisticated analytics and risk assessment models to detect and measure potential dangers. This will enable users to modify their investment strategy and enhance portfolio performance.

10.3. Actual Deployment

In order to ensure scalability, stability, and security, the project will actually be deployed to a larger user base. In order to handle growing user traffic and data volume, this phase will involve thorough testing, performance improvement, and infrastructure scalability.

10.4. User Feedback

User feedback serves as a valuable source of insights and ideas for enhancing features and functionality. It helps prioritize development efforts, guiding the allocation of resources to areas with the highest impact on user satisfaction and engagement. the development team can iteratively enhance the project to better meet user needs and expectations for refinement of the project.

10.5. Price prediction of Mutual Funds

Using real-time market data, we are excited to expand the project to incorporate mutual fund price prediction analysis.

Using predictive models to analyse current market patterns and trends and predict future price trends will be beneficial. Real-time prices will be used to provide more precise insights into market dynamics and to make predictions. One of the things on our future agenda is to incorporate predictive analytics into the user dashboard so that users may receive actionable insights and recommendations.

11. References

https://nodejs.org/docs/latest/api/

https://legacy.reactjs.org/docs/getting-started.html

https://groww.in/

https://www.google.com/finance/?hl=en

https://www.angelone.in/

https://upstox.com/

https://www.mongodb.com/