Mutual Fund Portfolio Analyzer

Synopsis

A Project report submitted in partial fulfillment of the requirements for the Award of the degree

MASTER OF COMPUTER APPLICATIONS 2021

Department of Computer Science and Applications
Panjab University, Chandigarh

Submitted By

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Submitted to :

Name of the Guide : Mr. Mohinder Singh Negi

Acknowledgement

A formal statement of acknowledgement is hardly sufficient to express my gratitude towards the personalities who have helped me to undertake and carry out this project. I hereby convey my thankfulness and obligation to all those who have provided me valuable help, support and guidance for my seminar.

First and foremost, I express my profound gratitude and deep regards to my External Guide Mr. Sumatra Ghosh (Tech Lead of our project) Priyadarshi-Track Helper. Their keen interest and encouragement has been of immense help to me. They gave me unending support and helped me in numerous ways. Their stimulating suggestions helped me to coordinate my project. I would also like to thank my Internal Guide Mr. Mohinder Singh Negi for his valuable time for their suggestions regarding this project.

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TO WHOMSOEVER IT MAY CONCERN

Date: 17 May 2021

Dear Sir / Madam,

This is to inform you that Mr. Vishal Rana MCA , 6th Semester Student from Panjab University , is currently pursuing his 6 Month internship at Hashedin by Deloitte, Bangalore (Intern ID - IN2021 47) since February 2021 to May 2021 and has completed 3 months to date on below project:

Project Title: Mutual Fund Portfolio Analyzer

Mentor Name: Sumantra Ghosh

Number of working days per week: 5

Mr. Vishal Rana is in his training period and is being assessed on intervals. Performance details will be shared pursuant to completion of internship.

Regards,

Suchitra Indukuri

(HR Executive)

HashedIn by Deloitte

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Add Headings (Format > Paragraph styles) and they will appear in your table of contents.

Mutual Fund Portfolio Analyzer

Introduction

Mutual Fund Portfolio Analyzer is one of its kind easy to use online platform where a person/investor can easily compare various mutual funds present in his/her portfolio in order to diversify risk.

Mutual Fund Portfolio Analyzer is a web-based application that can be run on any web-browser. This application is useful for investors who invest in Mutual Funds.
This application has the following two main features.

- Change Over Time : An investor can see how a mutual fund changed over time. By change over time we mean how it's stocks contribution is affected for a given period of time, what are the new stocks that are added, and which stock have been deleted.
- Overlap : An investor can see how a mutual fund overlaps with another mutual fund. Since it would be useless to buy a mutual fund which overlaps a lot with other mutual funds that they have in their portfolio. So this tool can be used to diversify an investor's investments.

Objectives

Write now at the time of writing this document we are working on three Mutual Fund Houses as follows:

- HDFC
- ICICI Prudential
- UTI MF

Business Problem :

There is no user-friendly platform where one can compare mutual funds. Platforms which exist are in the form of excel extensions which are tough to use for laymen.

Companies do disclose their portfolios every month in the form of excel sheets but to go through them and create reports is a cumbersome process.

Goal :

As a backend developer we have to build a pipeline such that if at one end we add an excel file that contains Mutual Fund data for a particular month of a particular Mutual Fund House then it should be automatically added to the database.

Implement business logic for two main features mentioned in the Introduction section.

Build and expose APIs so that the front-end application can get required structured data from the backend so that it can display visually on the front-end.

Usefulness of the Project

Before discussing benefits of the project we should first look at the pain points from a user perspective.

Pain Points

Context : Providing some background information about which to think upon.

Above mentioned three Mutual Fund Houses generate excel sheets every month that contain all their mutual Fund data for that particular month.

An investor would like to see how a Mutual Fund is performing over a given period of time. They would like to see some analytics over the mutual fund.

They would like to compare a mutual fund with another mutual fund for a particular month so that they can check how much diversity would they gain if they would add them to their portfolio.

- An investor has to go manually to Mutual Fund House's website (in which they are interested) to download an excel sheet having Mutual Fund data of the house for a particular month.
- An investor has to be aware of when a Mutual Fund House generally releases their excel sheet. So that they can make decisions as fast as possible before the market gains momentum due to the new report.
- Although the excel sheet is human readable, it generally contains a lot of data that may be unnecessary for an investor. Like if an investor wants to see only Equity related funds but an excel sheet would have equity related funds, loans, derivatives etc. This makes the size of the excel sheet big that may be overwhelming to the investor and hard to cope up with.
- It is a very time consuming task to compare effectively a mutual fund over a given period of time or with another mutual fund by reading excel data manually. It can

take from days to a week. And it is not what everyone knows about how to produce effective analytical reports.
- An investor needs software to view those excel sheets in his computer or in his/her mobile device.

Benefits of MFPA

- You don't have to download excel sheets manually on your computer. You can directly go to our website and check which mutual fund progress report you want to see.
- You don't have to remember how to download excel sheets for a particular Mutual Fund House. The way i.e the user story they follow to download an excel sheet for a particular Mutual Fund House can vary between different Mutual Fund Houses.
- You can see the progress of a mutual fund over a given period of time in just a few seconds.
- Now you don't have to compare them manually.
- You don't need any extra software. You just need a web browser and internet connection.
- If you don't know how to generate analytical reports you can use this tool to see analytical reports, you just need to learn how to use those tools.

Architectural Design

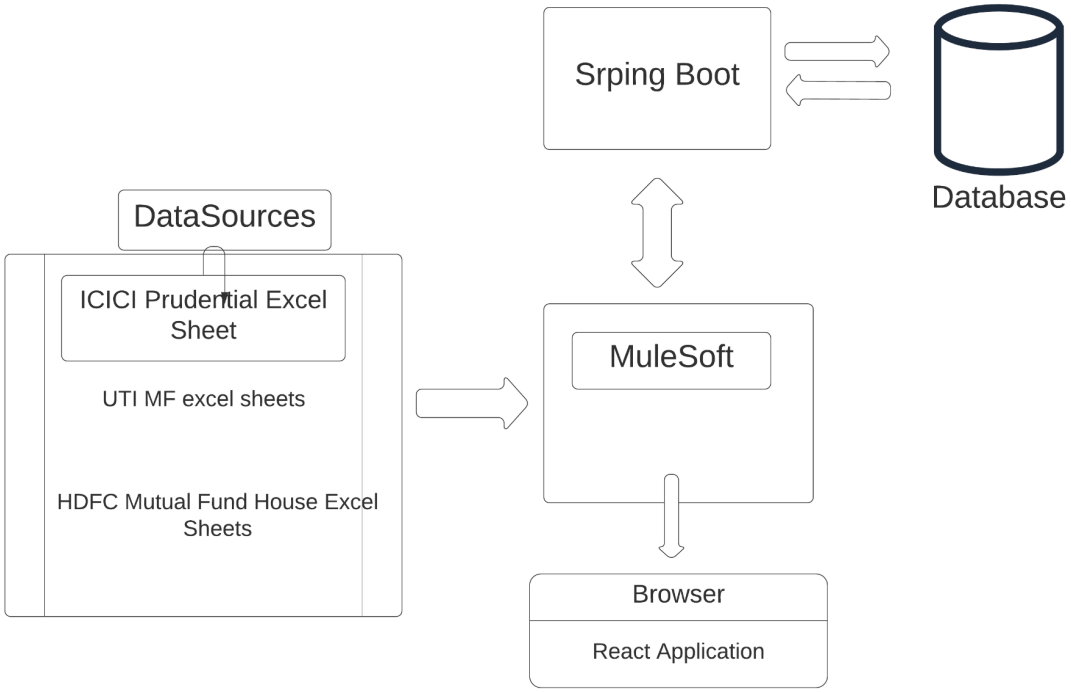
Technical Stack

- FrontEnd - React
- Backend
  - Spring Boot
  - Mulesoft
  - Postgres

Spring Boot : Spring boot application is handling the core business logic for generating reports from the data stored in the database. APIs are exposed to Mulesoft to save data and to request to generate reports from the data by giving required parameters.

Mulesoft : Mulesoft is a data integration platform built to connect a variety of data sources and applications and performs analytics and ETL processes.

Postgres : Database to save data.



The above diagram shows the high level architecture of the application.

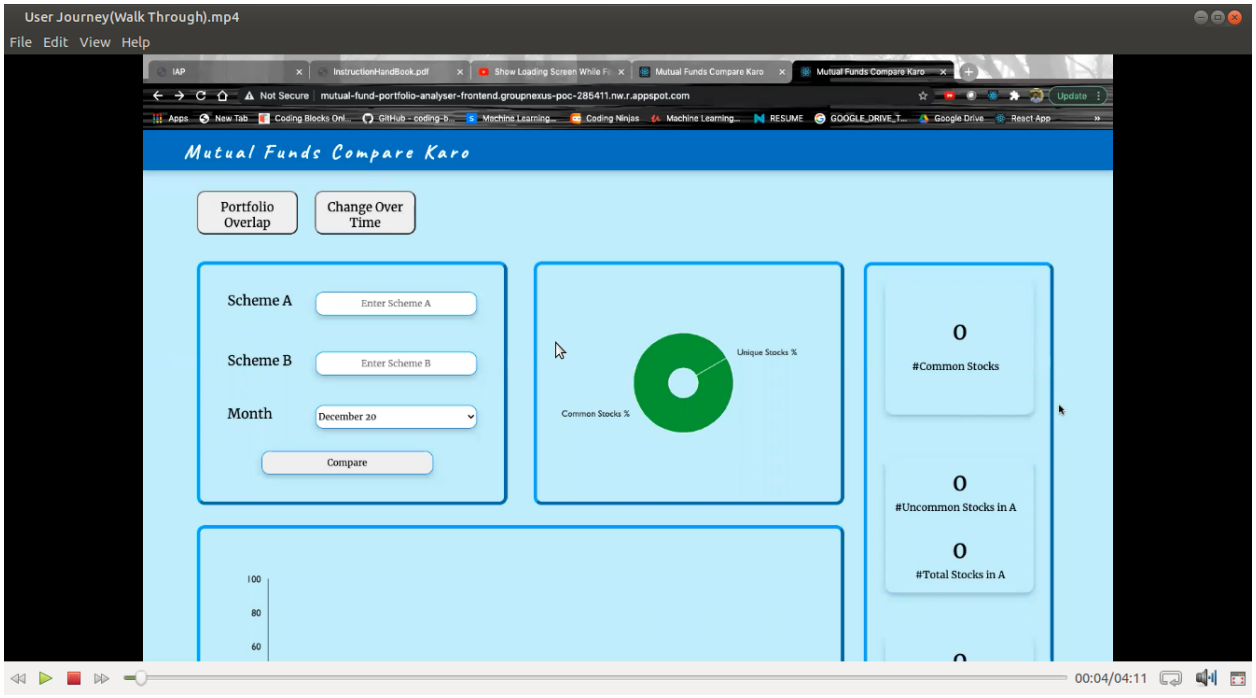
Data Sources represent excel sheets.

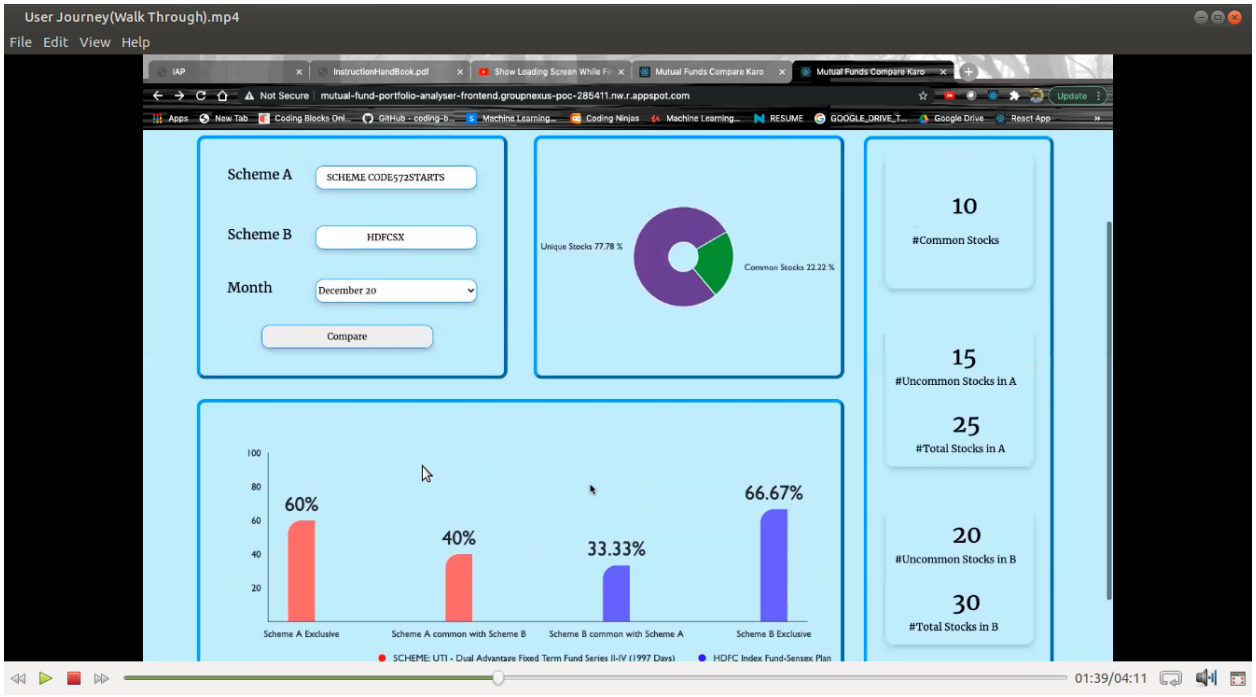
Here the Mulesoft application is responsible for taking data from excel sheet and converting that data into a specified format so that it can be saved to the database through the exposed API by Spring boot.

Usually different Mutual Fund Houses follow their own structure to provide information in excel sheets. All those abstractions are taken care of by mulesoft. Once the data is posted to the Spring boot application it validates them and then puts them into the database after successfully validating it so that it can be used for processing business logic.

When a request is generated by a user to some reports on the front-end, the front-end application requests data from the mulesoft and the mulesoft in turn requests data from Spring boot. Here the Mulesoft is acting like a pass-through, i.e it does not affect the request in any way. Using this way we can add security to our Spring Boot application using Mulesoft and in summary we can easily protect our Spring Boot's API, like it is done in Industry standard projects.

Screenshots from the Project





Description : Portfolio Overlap of two different Mutual Funds selected by the User

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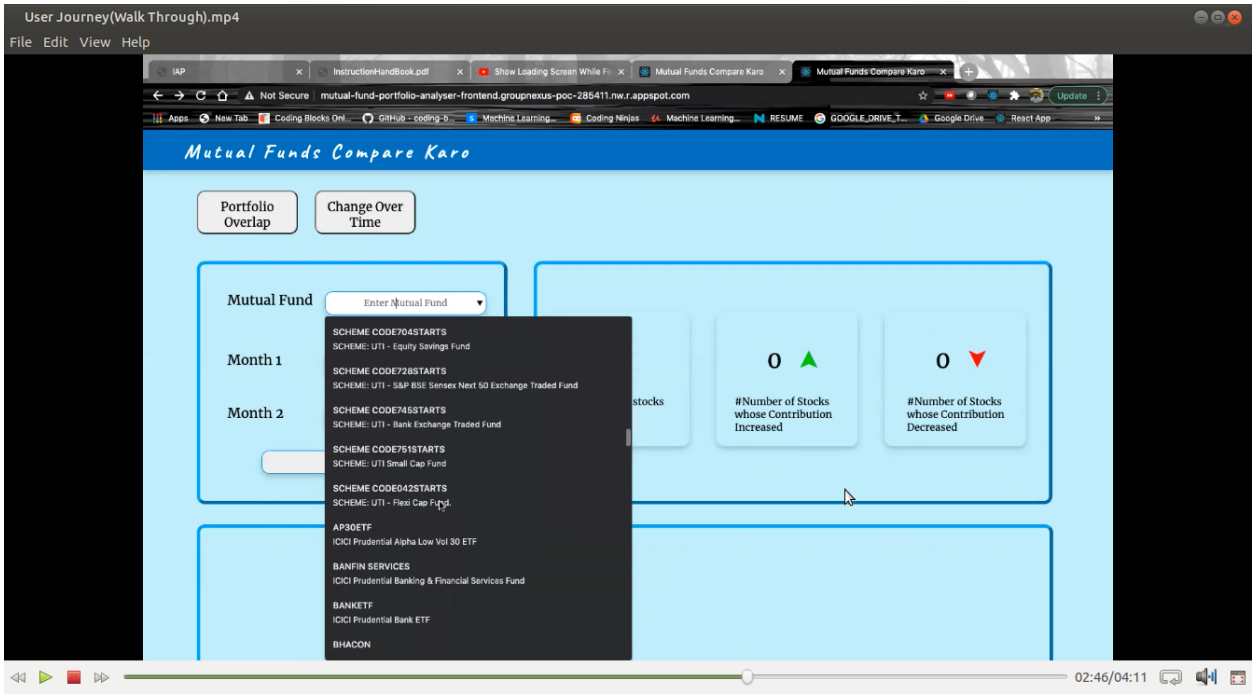

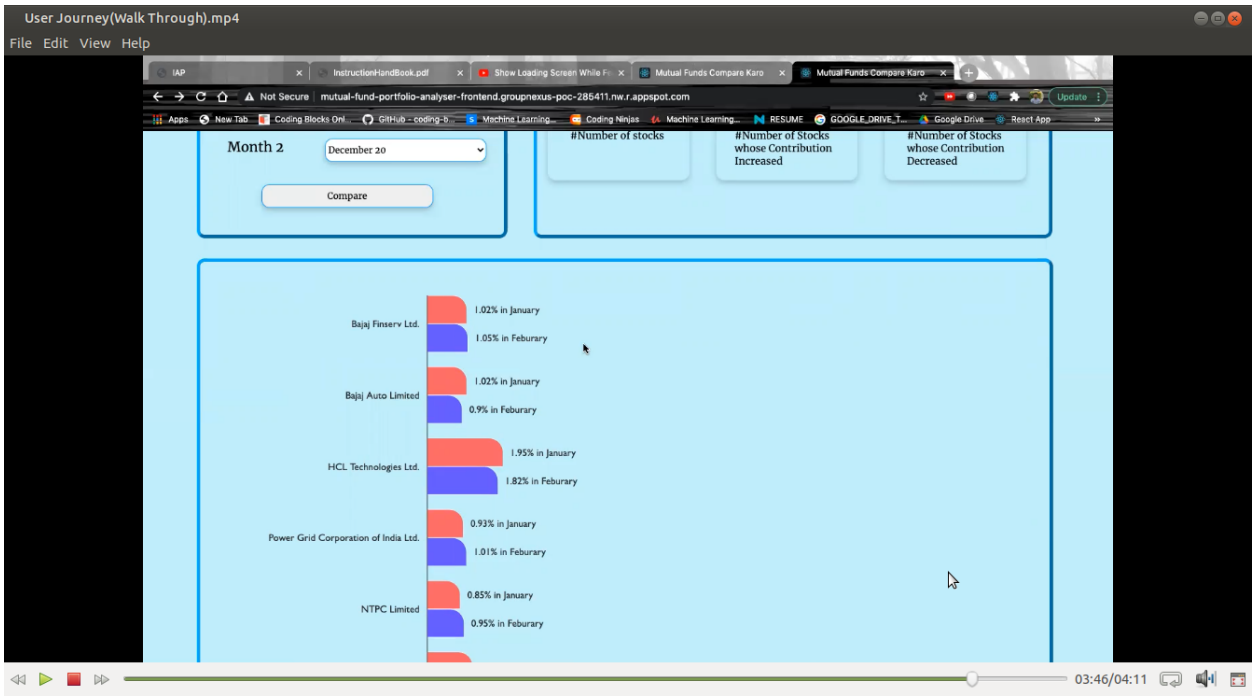

Description : Change over time of a particular Mutual Fund selected by the User.

Tools and Languages Used

Anypoint Studio Platform
IntelliJ IDEA
Gitlab

PgAdmin

Languages Used

Dataweave expression Language - Mulesoft
Java - Spring Boot
JPA - Postgres

System Requirements for Developers:

- 16GB RAM
- I7 processor
- Windows OS
- Postgresql
- JDK 11

Future Plan.

- We are planning to in-corporate data science to predict performance of various mutual funds w.r.t its previous performance.
- We are planning to make a newsletter to which a user can subscribe to, to get mail notification of selected mutual funds's progress of the current month compared to the previous month as soon as the excel sheet is generated by their respective Mutual Fund House.
- Now we are working with only three Mutual Fund Houses that we have mentioned in the Introduction. Trying to incorporate other mutual fund houses.
- Planning to make the user interface more rich by adding graphs, charts and other tools.
- We are planning to create an interface through which a user can make his/her portfolio and see how its portfolio is progressing over the time.

References :

1. Spring Boot
    - Documentation : https://spring.io/projects/spring-boot
    - Tutorials : https://vladmihalcea.com/tutorials/spring/
    - JPA : https://thorben-janssen.com/
2. Mulesoft
    - Documentation : https://docs.mulesoft.com/general/
    - Blog : https://blogs.mulesoft.com/bloghome/

    - MuleSoft TechZone (Youtube channel) : https://www.youtube.com/playlist?list=PL61bQcdxsK6_1tb0BbAtAOX_SdtvgQlxV
3. Gitlab
    - Gitlab Basics : https://docs.gitlab.com/ee/gitlab-basics/
4. JUnit
- https://junit.org/junit5/docs/current/user-guide/