MINIPROJECT REPORT

INVESTMENT PORTFOLIO MANAGEMENT SYSTEM

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1) DETAILED PROBLEM STATEMENT:

Investing in assets and watching their performance over time is crucial for wealth creation, compounding and beating inflation. It can make our money worth more tomorrow. But it is essential to invest right to reap its benefits. It is also necessary to manage all the investments made thus far in order to decide the future investment strategy.

With investments increasing in stock markets and related products, a comprehensive system is needed to keep track of and monitor the portfolio for investors. While there are many products in the form of websites and apps, they lack the integrated capability for investors and wealth managers to communicate and provide a real-time view of the status of the investments. In addition, investors would prefer to have an idea about their realized and unrealized gains and losses on a daily basis. This will help them to identify and phase out underperforming investments while increasing their holdings in appreciating assets. With the ability to communicate with their asset managers, the investors not only have the details but also timely advice on managing their investments.

The Investment Portfolio Management System calculates the asset value per day and the overall gain taking into account the invested amount, the price for the day, net asset value, time period and so on. The investors can update their portfolio with what they have purchased or sold once they log into the account. The investors can hold three types of accounts - an individual account, a group account or a joint account. An individual account can be viewed only by the person holding it. A group account lets the admin view the profiles of everyone in the group but the other account holders can only view the overall gain and their own profiles. A joint account allows all the account holders to observe others' profiles along with theirs. In all cases, investment managers are given access to the profiles of their clients. They can oversee the gains and losses in real time. The system mainly monitors the values of instruments such as shares held in stocks, mutual funds, ULIP and bullion.

The investors can request the investment managers to propose instruments to buy or sell. The investment managers can view the

profile and current standings and give suggestions or make the transaction and update the profile.

The project aims to facilitate the cumbersome process of keeping track and calculating the realized and unrealized gains of assets and also interact with the investment managers to further the gains.

2) SOFTWARE REQUIREMENTS:

1. **Abstract (Problem Statement Description):**
   Investing in assets and watching their performance over time is crucial for wealth creation, compounding and beating inflation. It can make our money worth more tomorrow. But it is essential to invest right to reap its benefits. It is also necessary to manage all the investments made thus far in order to decide the future investment strategy. This system facilitates portfolio tracking.

2. **Introduction**
   2.1. **Purpose:**
   The Software Requirements Specification intends to outline the behaviour of the Investment Portfolio Management System. It defines the operations, interfaces and interactions, performance and quality assurance requirements of the Investment Portfolio Management System. It describes the non-functional requirements and design constraints to provide a complete description of the requirements for the software.

   2.2. **Scope:**
   The software requirements specification captures all the requirements of the Investment Portfolio Management System in a single document. This system aims to facilitate the cumbersome process of keeping track of and calculating the realized and unrealized gains of assets. It also allows the investors to interact with the investment managers to analyse and further the gains. The system makes use of a database to store the account and investor information and gets real-time market information.

3. **Intended Audience:**
   The software requirements specification document is intended for the developers and describes the functionality of the product.

4. Overall Description

4.1. Users (Actors):

The users of the system are investors and investment managers. The proper user interface, user manual, online help and guide to install and maintain the system must be sufficient to guide the users on how to use the web application without any problems.

4.2. Characteristics:

The Investment Portfolio Management System is a web application that can be used by investors and investment managers to efficiently analyse the losses and gains from the investments made. It shows the overall gain since the day of investment and the gain since the previous day. The investors can get a consultation regarding their assets from their asset managers. They can update their shares with the transactions they have made.

4.3. Functional Requirements:

- Provides security using username and password.

- The user information is stored in a database to give security.

- The users can update their profile by selecting the company and adding or selling shares.

- The system will calculate the gain based on the day of investment (investment price) using the price for the day.

- It can obtain the market price and net asset value using API.

- The users can collaborate with the fund manager.

- It is responsive and resizes based on screen size.

4.4. Sub Functionalities:

- **Security:**
  The users can log into the system using their username and password. They can create accounts as well.

- **Adding/Selling:**
  The users can be directed to stocks, mutual funds, ULIP or bullion.

- **Collaboration:**
  The users can request their investment managers for suggestions. The investment managers can suggest or add or sell shares.

5. Requirements Specification:

5.1. User Interfaces:

- **Login interface:**
  There are two types of login possible. One for the investors and one for the asset managers.

- **Creating account:**
  The investors can create an individual account, a group account or a joint account. The investment manager's account gives access to the portfolios of the clients.

- **Summary:**
  The gain and loss per instrument and the overall gain are shown.

- **Adding shares in stocks:**
  This lets the user enter the company, investment date, quantity, optional charges, queries and gets the investment price and calculates the net amount. The update can be saved or cancelled. Once it is saved, the gain is calculated.

- **Adding shares in mutual funds:**
  It has two schemes - SIP and one-time.

  - **SIP:**
    It allows the user to pick a scheme, SIP amount, number of installments, SIP frequency and first SIP date. It calculates the value based on net asset value.

  - **One-time:**
    It allows the user to pick a scheme, investment date and investment amount, and gets investment NAV and calculates units. It calculates the value based on net asset value.

- **ULIP:**
  It allows users to pick a scheme, investment date, investment amount and optional charges. It gets NAV and calculates units and net amount. It also allows the users to add premium amount, premium start date, frequency and number of installments. Once the update has been saved, it calculates the gain.

- **Bullion:**
  It allows the user to pick gold or silver, quantity in grams, investment date and optional charges, gets the investment price and calculates the net value. Once the update has been saved, it calculates the gain.

- **Client profiles:**
  The investment managers can get the list of all the client portfolios.

- **Suggestion request:**
  The users can request the investment managers for shares to buy or sell. The investment managers can either suggest or add/sell on their own.

5.2. Non-functional Requirements:

- **Usability:**
  The users can access the system from the internet. It is comprehensible.

- **Reliability:**
  The system is very reliable as it handles sensitive information such as investment amounts and gains. It should ideally be available 24/7.
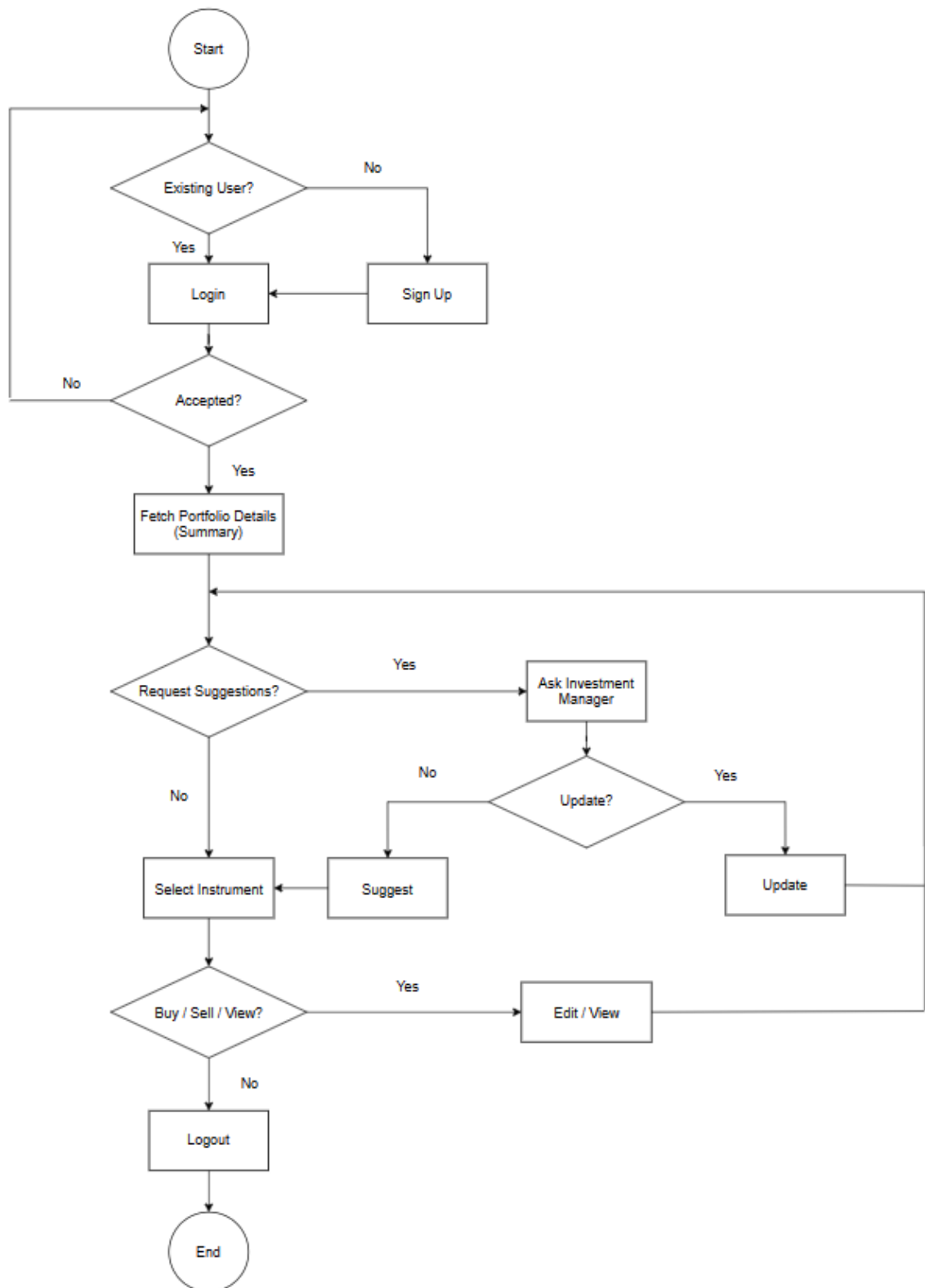
- **Scalability:**
  More users can be added to the system by adding more resources.

- **Performance:**
  The system shall take as little time as possible to provide the required services and will be able to handle high loads and traffic.

6.   System Flow Chart:

7. **Operating Environment:**
    The system will require the use of API to fetch the investment price, and NAV for the day and will also make use of a database of all the schemes and companies available to invest. The system will have a database to store the portfolio of various users.

8. **Hardware Requirements:**
    4-core processor, 4GB RAM, 100GB storage (Initially), Google Chrome or Edge web browser

9. **Technologies:**
    We intend on using HTML, Cascading Style Sheets and JavaScript, Java and SQL server to construct the system along with API for getting investment scheme details.

10. **Design and Implementation Constraints:**
    The system requires the use of third-party web services such as API. The real-time availability and reliability of the web service are necessary along with the free accessibility of data. If necessary, at a later stage, the service can be procured by paying the appropriate license cost.

11. **Performance Requirements:**
    Any click should give a response within 3 seconds. Login and data fetch will take place within 10 seconds. Page load should take place within 5 seconds.

12. **Security Requirements:**
    Login credentials and passwords will be well protected and the system will ensure privacy at the user, group and investment manager level with visibility restrictions.

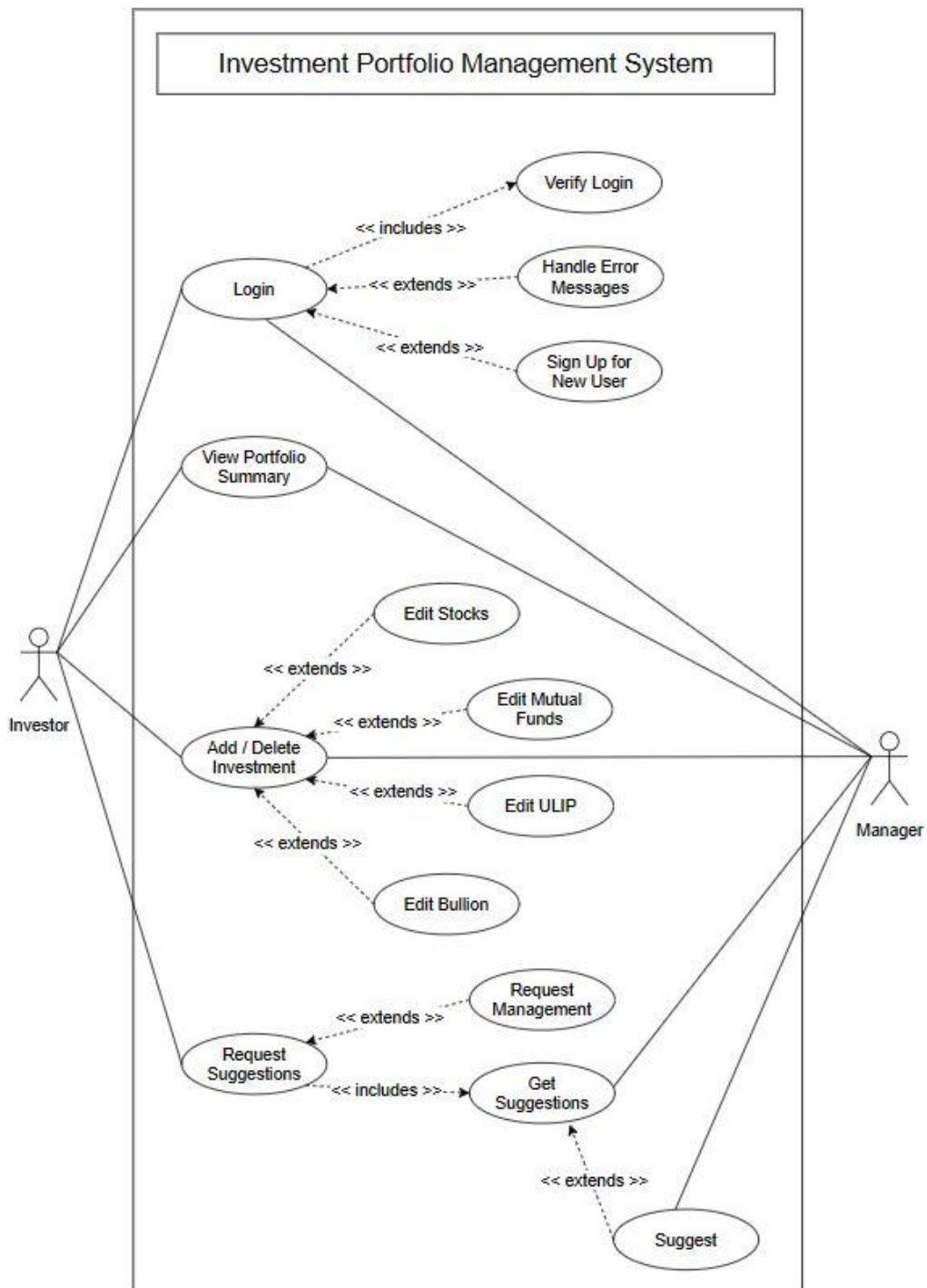**13. Software Quality Attribute:**

- **Portability:**
  In future, the system can be made portable for different operating systems and web browsers.

- **Maintainability:**
  The product catalogue should be refreshed with new data about AMCs and schemes and the database should contain the latest information.

3) SYSTEM DESIGN:

Investment Portfolio Management System

- Verify Login
- Login
  - << includes >> Verify Login
  - << extends >> Handle Error Messages
  - << extends >> Sign Up for New User
- View Portfolio Summary
- Edit Stocks
- Add / Delete Investment
  - << extends >> Edit Stocks
  - << extends >> Edit Mutual Funds
  - << extends >> Edit ULIP
  - << extends >> Edit Bullion
- Request Suggestions
  - << extends >> Request Management
  - << includes >> Get Suggestions
- Get Suggestions
  - << extends >> Suggest

Investor

Manager

SYSTEM OVERVIEW:

This system helps investors to track their investments and investment managers to manage the client portfolios. Following signup and login, the investors can view their portfolios, add stock, mutual fund and

ulip investments, delete and calculate realised and unrealised gain.
They can request the managers to manage their portfolios. The managers
can add client portfolios to their group, and view, add and remove
investments.

SCOPE: Investment Portfolio Management
LEVEL: User goal
PRIMARY ACTORS: Investors, Managers

STAKEHOLDERS AND INTERESTS:
- **INVESTORS:**
  Wants a user-friendly portal to add, delete and edit investments.
  The process of getting suggestions from the wealth managers is
  also made accessible via the system.

- **MANAGERS:**
  Wants an easy-to-use portal with the capability to monitor and
  assess clients' profiles.

PRECONDITION:
Investors and managers are identified and authorised using the portal
using a mail ID. The systems are required to support Java and
Javascript. An Internet connection is required to access the website.

SUCCESS GUARANTEE:
All the clients will be able to add, delete and edit their
investments. They will be able to get suggestions from their wealth
managers and the wealth managers can manage the client's investments.

MAIN SUCCESS SCENARIO:
1. The wealth manager is provided access to view the account
   holder's investment portfolio.
2. The wealth manager can make suggestions or manage the client's
   profile based on their choice.
3. Wealth manager will overlook the aforementioned functionalities
4. The account holder tries to login into the system.
5. The login credentials are verified and access is granted.
6. In case of invalid login, the system invokes the necessary
   error-handling mechanism.
7. Account holders can view their portfolio summary.

8. The account holders are given access to update their investments like adding or deleting investments.
9. The account holders can choose from a range of investment types like stocks, mutual funds, ULIP and bullion.
10. The client can also request investment suggestions from the wealth manager.
11. The account holder can also ask the wealth manager to manage their profile.

ALTERNATE SCENARIO:
Based on the request from the user, the investment manager will be able to view and update the portfolio of the individual investor.

FAILURE CASE:
The same investor cannot belong to two different manager groups.

4) FUNCTIONALITY OF EACH MODULE:
There are two modules - Investor and Investment Manager.

Investor Module
Signup: Investors can create an account with their email, username and password. There can only be one account per email and username.
Login: Investors can log in with their email and password.
View Purchased Stocks, Mutual Funds and Bullion: Investors can view their investments and keep track of the realised and unrealised gains.
Add Stocks, Mutual Funds and Bullion: Investors can add new investments by choosing the scheme, purchase price/NAV and quantity/investment price.
Sell Stocks, Mutual Funds and Bullion: Investors can keep track of the shares that have been sold and gain from that.
Delete Stocks, Mutual Funds and Bullion: Investors can delete the wrongfully entered purchase. This will not affect their realised gain.
Request: Investors can give requests to the manager to view and make changes to the portfolio.

Investment Manager Module
Signup: Managers can create an account with their email, username and password. There can only be one account per email and username.
Login: Managers can log in with their email and password.
Add Members to Group: Managers can add members who are not a part of some other group to their group.
View Purchased Stocks, Mutual Funds and Bullion: Managers can view the profile of the investors who are a part of the manager's group along with their requests.
Add Stocks, Mutual Funds and Bullion: Managers can add new investments by choosing the scheme, purchase price/NAV and quantity/investment price.
Sell Stocks, Mutual Funds and Bullion: Managers can keep track of the shares that have been sold and gain from that.

5) LOGIC OF EACH MODULE:
Investor Module
Signup: When investors create their accounts, their details are stored in a database along with a blank entry for their manager. An entry is made into another table to keep track of the realised gains.

Login: Investors can log in if their email and password are verified. The details stored during signup are used to verify the credentials for logging in.

View Purchased Stocks, Mutual Funds and Bullion: All the purchases can be fetched from the corresponding tables and displayed.

Add Stocks, Mutual Funds and Bullion: New purchases are added to the table with the purchase details and username.

Sell Stocks, Mutual Funds and Bullion: Purchases are deleted from the table with the purchase details and username. Realised gain is calculated by adding the gain from selling purchase to the existing gain in the table that stores realised gain.

Delete Stocks, Mutual Funds and Bullion: Purchases are deleted from the table with the purchase details and username.

Request: Investors can give requests to the manager to view and make changes to the portfolio. The request gets stored in a table with the username, manager name and request. This can be viewed by the manager when viewing the client profiles.

Investment Manager Module
Signup: When managers create their accounts, their details are stored in a database.

Login: Investors can log in if their email and password are verified. The details stored during signup are used to verify the credentials for logging in.

Add Members to Group: Managers can add members who are not a part of some other group to their group. The entry made into the table while

creating an investor account is modified to include the manager's name.

View Purchased Stocks, Mutual Funds and Bullion: All the purchases can be fetched from the corresponding tables and displayed.

Add Stocks, Mutual Funds and Bullion: New purchases are added to the table with the purchase details and username.

Sell Stocks, Mutual Funds and Bullion: Purchases are deleted from the table with the purchase details and username. Realised gain is calculated by adding the gain from selling purchase to the existing gain in the table that stores realised gain.

View Requests: While viewing the clients in the group, a pending request is indicated if there is an entry in the request table.

6) USAGE OF NEW TOOLS FOR BETTER FUNCTIONALITY:
While developing our Investment Portfolio Management System, we used HTML, CSS and JavaScript for the frontend.

For the backend, we made extensive use of Java Servlets to couple the front end and database. We employed servlets to fetch, insert and delete entries from the table. We used Ajax to give autofill capabilities to forms. We used MySQL for our database. We made use of tables to store every account and purchase details and also to store requests made by the investor. We also made limited use of Java Server Pages to facilitate sending and receiving of data from one HTML page to another.

7) FEATURES OR TECHNIQUES NOT EMPLOYED:
Our initial system design included fetching investment prices and Net Asset Values using an API in order to keep track of investments in real-time. We could not get free APIs compatible with Java which will be able to do the same.

Another feature that could be included is notifying the manager and user if the gain of a stock goes above a threshold. This would be possible if the prices are monitored continuously.

Chat feature was included initially but morphed into a request feature where the manager will only be able to see the presence of a request and not what request.

8) SCREENSHOTS:

IPMS
Investment Portfolio Management System

INVESTOR LOGIN

Email

Email

Password

Password

Investor Login

Don't have an account? Sign Up

» Manager Login

IPMS
Investment Portfolio Management System

MANAGER LOGIN

Email

Email

Password

Password

Manager Login

Don't have an account? Sign Up

« Investor Login

IPMS
Investment Portfolio Management System

INVESTOR SIGN UP

Email

Email

Username

Username

Password

Password

Retype Password

Retype Password

Manager Sign Up

Investor Sign Up

Registered User? Login

IPMS
Investment Portfolio Management System

Investor Sign Up

MANAGER SIGN UP

Email

Email

Username

Username

Password

Password

Retype Password

Retype Password

Manager Sign Up

Registered User? Login

IPMS

Investment Portfolio Management System

Incorrect Username or Password!

OK

IPMS

Investment Portfolio Management System

Success! Proceed to Login!

OK

WELCOME TO IPMS!

📄 Request

📈 Stock

🤲 Mutual Fund

🏅 Bullion

➡ Logout

WELCOME TO IPMS!

PURCHASED STOCKS

ADD STOCKS

None Added!

Unrealised Gain
0.0

Realised Gain
0.0

ADD STOCK

Scheme
Scheme

Quantity
Quantity

Investment Price
Investment Price

Net Amount

Current Price

Add

Cancel

ADD STOCK

Scheme
ICICI

Quantity
10

Investment Price
900

Net Amount
9000

Current Price
936

[Add]   [Cancel]

PURCHASED STOCKS

[ADD STOCKS]

Scheme: ICICI   Gain: 360.0

Purchase Price: 900

Current Price: 936   [Sell]

Quantity: 10

Net Amount: 9000   [Delete]

Unrealised Gain 360.0

Realised Gain 0.0

PURCHASED MUTUAL FUNDS

ADD MF

None Added!

Unrealised Gain
0.0

Realised Gain
0.0

ADD MUTUAL FUND

Scheme
Scheme

Investment Amount
Investment Amount

Purchase NAV
Purchase NAV

Units

Current NAV

Add

Cancel

ADD MUTUAL FUND

Scheme
HDFCRetirementSavings

Investment Amount
30000

Purchase NAV
30

Units
1000

Current NAV
36

Add

Cancel

ShrutiSriram

PURCHASED BULLION

ADD BULLION

None Added!

Unrealised Gain
0.0

Realised Gain
0.0

ADD BULLION

Scheme

Scheme

Quantity in Grams

Quantity

Investment Price per Gram

Investment Price

Net Amount

Current Price per Gram

Add

Cancel

ADD BULLION

Scheme

Gold

Quantity in Grams

8

Investment Price per Gram

5400

Net Amount

43200

Current Price per Gram

6175

Add

Cancel

PURCHASED BULLION

ADD BULLION

Scheme: Gold

Gain: 6200.0

Purchase Price: 5400

Sell

Current Price: 6175

Quantity: 8

Delete

Net Amount: 43200

Unrealised Gain 6200.0

Realised Gain 0.0

LOGOUT?

Yes

No

WELCOME TO IPMS!

☰   👤 Smrithi

👥 Group

⬅ Logout

WELCOME TO IPMS!

INVESTOR

Email: svshruti28@gmail.com

Username: Shruti

Request Pending

View

ADD MEMBER

ADD INVESTOR

Username

Username

Add

Cancel

PURCHASED ASSETS OF Shruti

STOCK

Scheme: ICICI   Gain: 1360.0

Purchase Price: 800

Current Price: 936

Quantity: 10   Sell

Net Amount: 8000

None Added!

ADD STOCKS

Unrealised Gain
Stocks
1360.0

ADD MF

Unrealised Gain
Mutual Funds
0.0

ADD BULLION

Unrealised Gain
Bullion
0.0

PURCHASED ASSETS OF Shruti

Net Amount: 8000

None Added!

None Added!

ADD STOCKS

Unrealised Gain
Stocks
1360.0

ADD MF

Unrealised Gain
Mutual Funds
0.0

ADD BULLION

Unrealised Gain
Bullion
0.0

PURCHASED ASSETS OF Shruti

MUTUAL FUND

Scheme: HDFCRetirementSavings

Purchase nav: 25

Current nav: 36

amount: 100000

Units: 4000

Gain: 44000.0

Sell

ADD STOCKS

Unrealised Gain
Stocks
1360.0

ADD MF

Unrealised Gain
Mutual Funds
44000.0

ADD BULLION

Unrealised Gain
Bullion
317500.0

BULLION

Scheme: Gold

Purchase Price: 3000

Current Price: 6175

Gain: 317500.0

Current nav: 36

amount: 100000

Units: 4000

Sell

ADD STOCKS

Unrealised Gain
Stocks
1360.0

ADD MF

Unrealised Gain
Mutual Funds
44000.0

BULLION

Scheme: Gold

Purchase Price: 3000

Current Price: 6175

Quantity: 100

Net Amount: 300000

Gain: 317500.0

Sell

ADD BULLION

Unrealised Gain
Bullion
317500.0