

# High-level Breakdown Analysis of the Investment Firm Problem

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## Introduction:

This project simulates an investment firm that manages client portfolios through financial advisors. The system tracks stocks, advisors, clients, and their investment accounts.

## Data Model:

Clients: Identified by unique ID, name.

Financial Advisors: Identified by unique ID, name.

Investment Accounts: Owned by a client, managed by an advisor, identified by a unique ID, account name, profile type (investment strategy), reinvestment preference (dividends used to buy more stock).

Stocks: Identified by company name, stock symbol, sector (industry).

Prices: Track the current price per share for each stock.

Investment Profiles: Define the desired investment strategy for an account by specifying the percentage of holdings in each sector.

Client Holdings: Track how many shares of each stock a client holds within each account (including fractional shares managed by the firm).

## System Functionality:

- Manage basic entities (add/remove clients, advisors, define investment profiles, etc.)
- Manage investment accounts (assign advisor, define profile, set reinvestment preference).
- Trade stocks (buy/sell shares for an account).
- Disburse dividends (distribute dividends to accounts and potentially buy more stock based on reinvestment preference).
- Track portfolio performance (account value, advisor portfolio value).
- Analyse investment strategies (compare sector weightings, identify similar portfolios).

- Recommend stock trades (suggest buying or selling stocks based on similar portfolios).
- Identify advisor preferences (group advisors with similar investment strategies).

## Key Challenges:

- Fractional Shares: The system needs to track fractional shares of stocks owned by clients and managed by the firm.
- Data Storage and Retrieval: Efficiently storing and retrieving data for analysis (e.g., portfolio value, sector weightings).
- Calculations: Implementing calculations for portfolio value, cosine similarity, and k-means clustering.