# Asset Management System
# Lab 2

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## Problem Statement

An asset management company needs an efficient and reliable database system to manage its diverse range of financial services and client portfolios. The company handles numerous clients, each with multiple investment accounts, and offers various financial products like mutual funds, stocks, and bonds. The database system should facilitate the seamless management of client information, investment transactions, and financial reports. The objective is to ensure data integrity, quick access to information, and support for complex queries and reporting.

## Entities and Relationships

### User

**Attributes:**

- UserID
- Username
- E-mail
- Password

**Relationships:**

- User - Position: One-to-Many (1:N) – A user has one position, but a position can be associated with multiple users.
- User - Portfolio: One-to-Many (1:N) – A user can have multiple portfolios, but each portfolio is linked to one user.
- User - SupportTicket: One-to-Many (1:N) – A user can create multiple support tickets, but each support ticket is linked to one user.

### Position

**Attributes:**

- PositionID
- Role
- Access

**Relationships:**

- Position - User: One-to-Many (1:N) – Each position is associated with multiple users, defining access and roles.

## Portfolio

**Attributes:**

- PortfolioID
- PortfolioName
- CreationDate
- UserID (Foreign Key)

**Relationships:**

- Portfolio - User: Many-to-One (N:1) – A portfolio belongs to one user, while a user can have multiple portfolios.
- Portfolio - Asset: Many-to-Many (M:N) – A portfolio can include multiple assets, and an asset can belong to multiple portfolios.
- Portfolio - Transaction: One-to-Many (1:N) – Each portfolio can have multiple transactions associated with it.

## Asset

**Attributes:**

- AssetID
- AssetName
- NAV

**Relationships:**

- Asset - Portfolio: Many-to-Many (M:N) – An asset can be part of multiple portfolios, and a portfolio can include multiple assets.
- Asset - Transaction: One-to-Many (1:N) – Each transaction involves one asset, but an asset can be involved in multiple transactions.

## AssetData

**Attributes:**

- AssetID
- Date
- NAV

**Relationships:**

- Assetdata - Transaction: One-to-Many (1:N) – Each transaction involves one asset, but an asset can be involved in multiple transactions.

## Transaction

**Attributes:**

- TransactionID
- Amount
- PortfolioID (Foreign Key)
- AssetID
- TransactionType
- Time
- unit

**Relationships:**

- Transaction - Portfolio: Many-to-One (N:1) – Each transaction is linked to one portfolio, but a portfolio can have multiple transactions.
- Transaction - Asset: Many-to-One (N:1) – Each transaction involves one asset, but an asset can be involved in multiple transactions.

## SupportTicket

**Attributes:**

- TicketID
- Status
- UserID
- CreationTime
- Issue
- End Time

**Relationships:**

- SupportTicket - User: Many-to-One (N:1) – Each support ticket is created by one user, but a user can create multiple support tickets.

## AdminLog

**Attributes:**

- userID
- ActionType
- ActionDate

**Relationships:**

- AdminLog - Action: One-to-Many (1:N) – Each admin log records an action, and an admin can have multiple log entries.

## Summary of Relationships

- One-to-Many (1:N) between:
  - User and Position
  - User and Portfolio
  - User and SupportTicket
  - Portfolio and Transaction
  - Asset and Transaction
- Many-to-Many (M:N) between:
  - Portfolio and Asset

## Questions/Queries

1. What is the total amount invested by each investor across all funds?
2. Which fund has the highest number of investors?
3. What is the average performance metric (e.g. CAGR) of a specific fund over the last year?
4. Which assets are the most commonly traded across all funds?
5. Who are the top-performing fund managers based on the average CAGR of the funds they manage?
6. How does the asset allocation vary by market for different funds?
7. What is the transaction history of a specific User and Assets across different funds?
8. Which funds have shown a significant change in risk profile over the past year?
9. Are there any funds that have failed to meet compliance requirements?
10. How does the investment distribution look across different asset classes (e.g., stocks, bonds)?