

# LECTURE-14

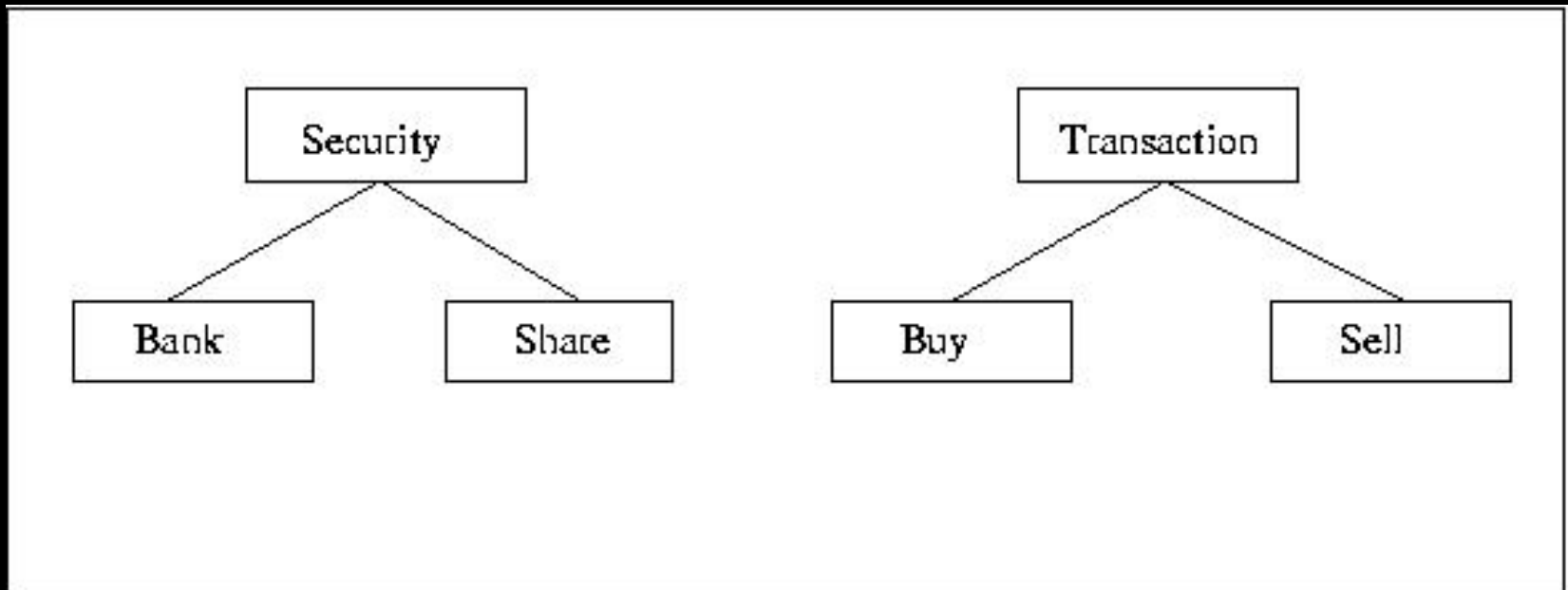
# Example OO Design – PIMS...

- Investor can have many portfolios
- Portfolio can have many investments
- Investor can invest and withdraw any amount of money at any time
  - Dates and amounts are tracked by PIMS
- Get current value of each investment from Web site
- Invest in instruments with fixed interest rates
  - Alert to notify pending maturity dates
- Save information about the portfolio
- Edit entered data
- View any portfolio
  - Summary
  - Detailed
- Provide security
- Determine rate of return
  - For each investment
  - Overall for each portfolio
  - Total investments
  - Compute on monthly basis

## Example OO Design – PIMS... Basic Classes

<b>Class</b>	<b>Principle Responsibility</b>
Investment	Manages computations regarding total investment.
Portfolio	Manages computations regarding a Portfolio.
Security	Manages computations related to a security.
Transaction	Manages computations and stores attributes related to a transaction.
GUI	Manages the Graphical User Interface.
NetLoader	Manages downloading current prices of shares from the Internet.
Current Value System	Manages current value of shares.
Alerts	Manages alerts.
SecurityManager	Manages user validation.
DataRepository	Manages all file operations. It is an interface between the main modules and the database (which in our case is done using file system.)

## Example OO Design – PIMS... Inheritance Structure



Two kinds of securities

Bank: interest bearing

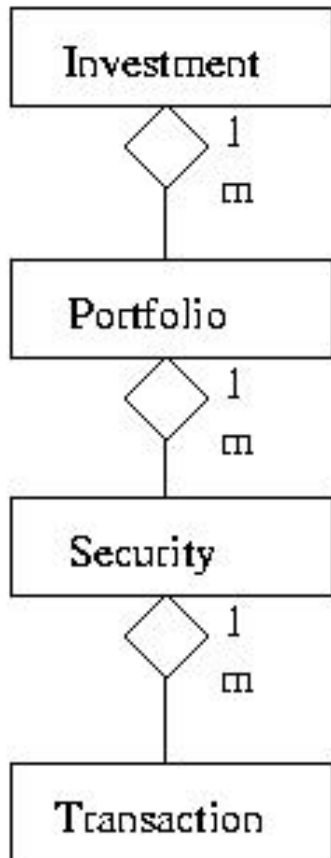
Shares: trading/dividends

Two kinds of transactions

buy: exchange cash for security

sell: exchange security for cash

## Example OO Design – PIMS... Aggregation Structure



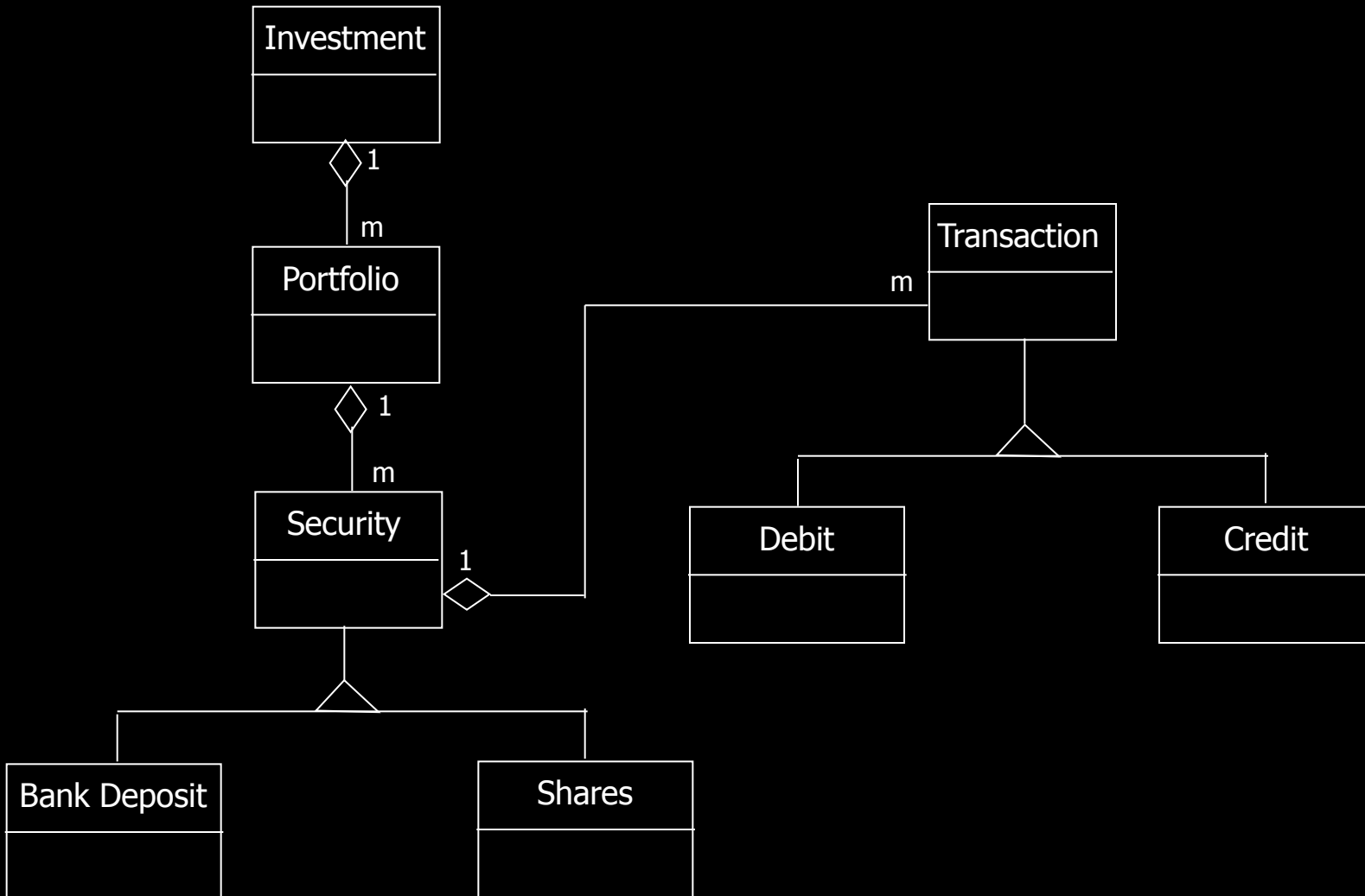
An investment consists of many portfolios

A portfolio can consist of many different securities

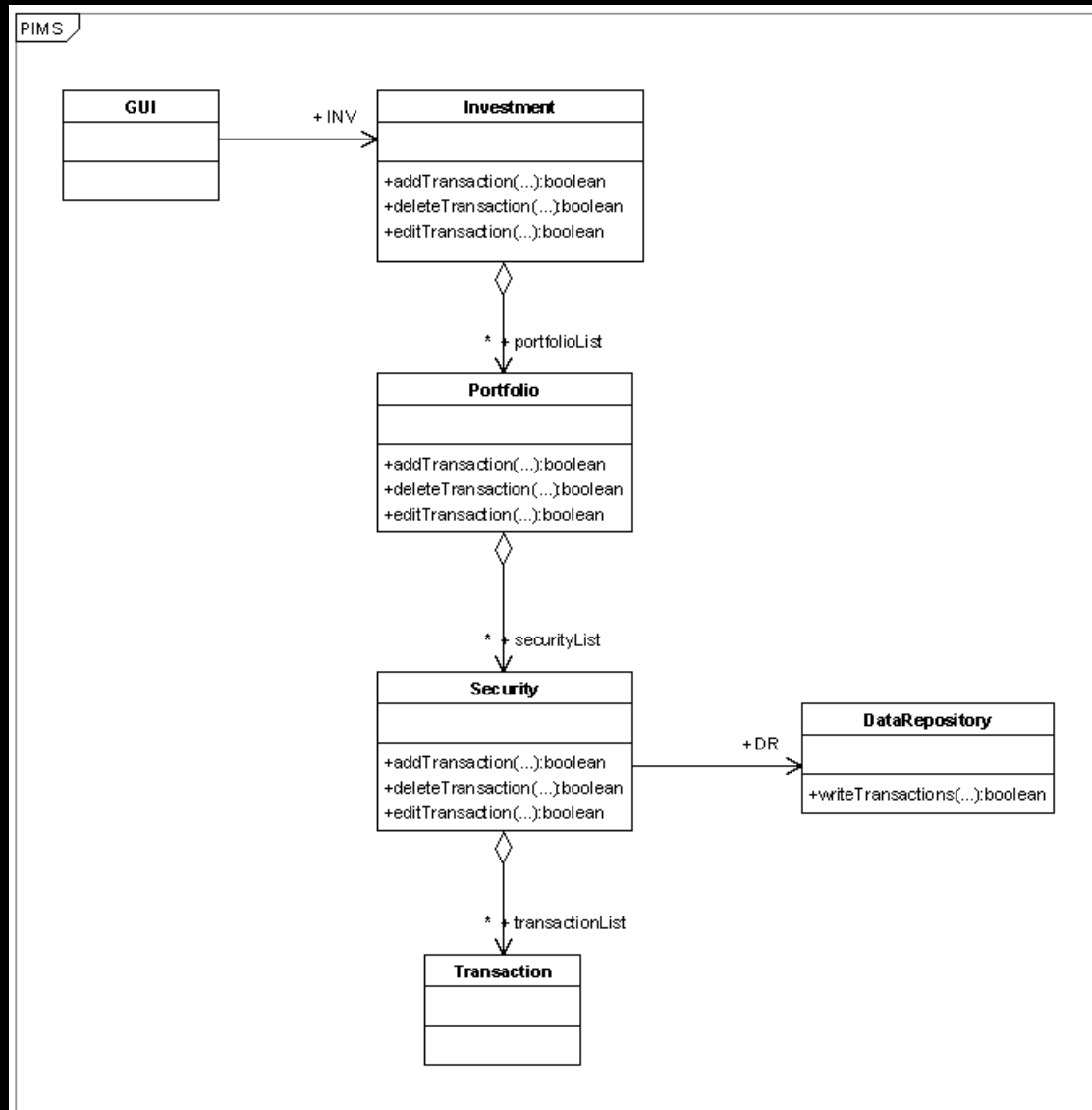
Many transactions can act on a single security

# Example OO Design – PIMS...

## Class Diagram

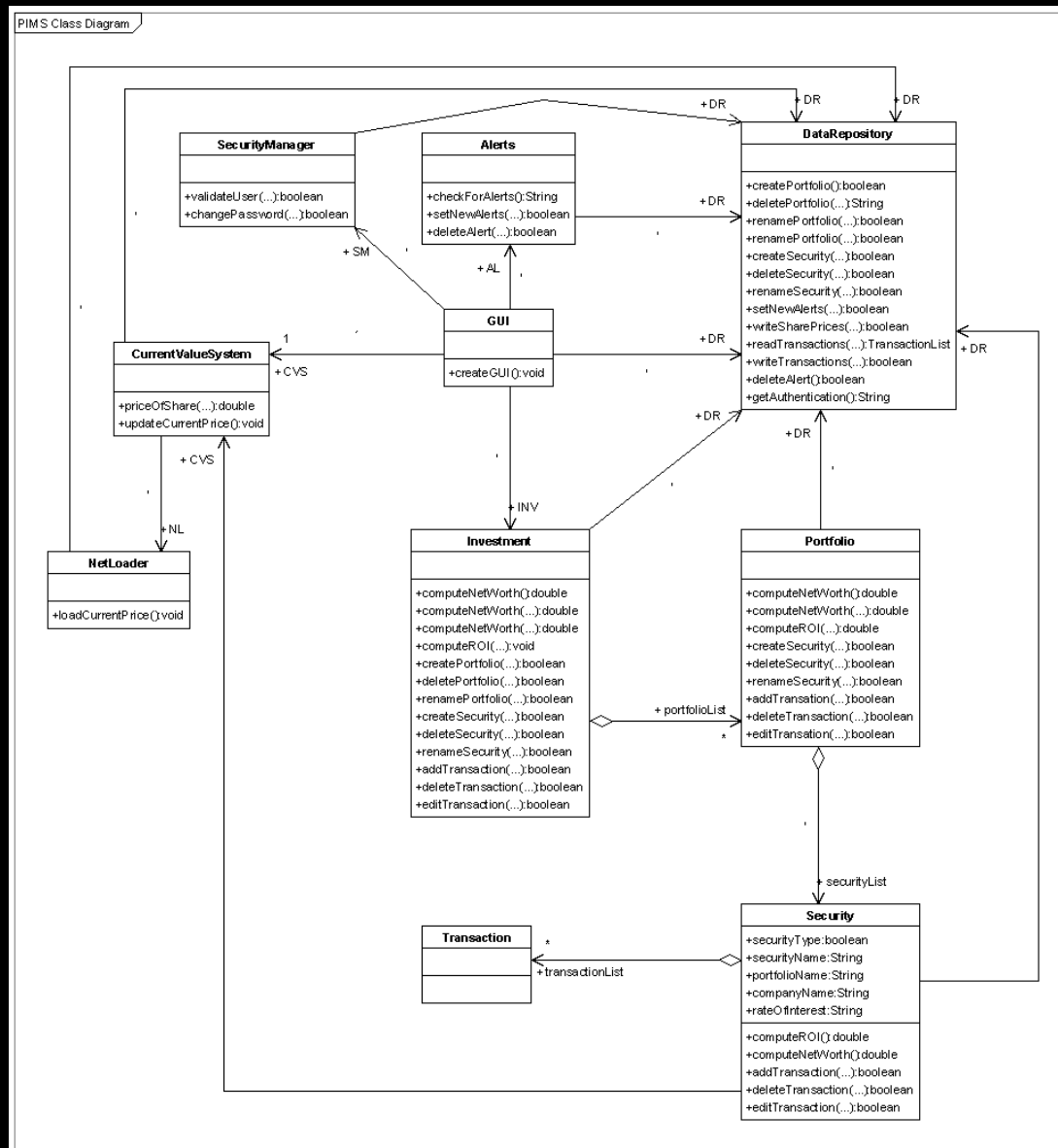


# Example OO Design – PIMS... associations for action Create/Delete/Edit Transaction



# Example OO Design – PIMS...

## Class diagram with all classes and associations



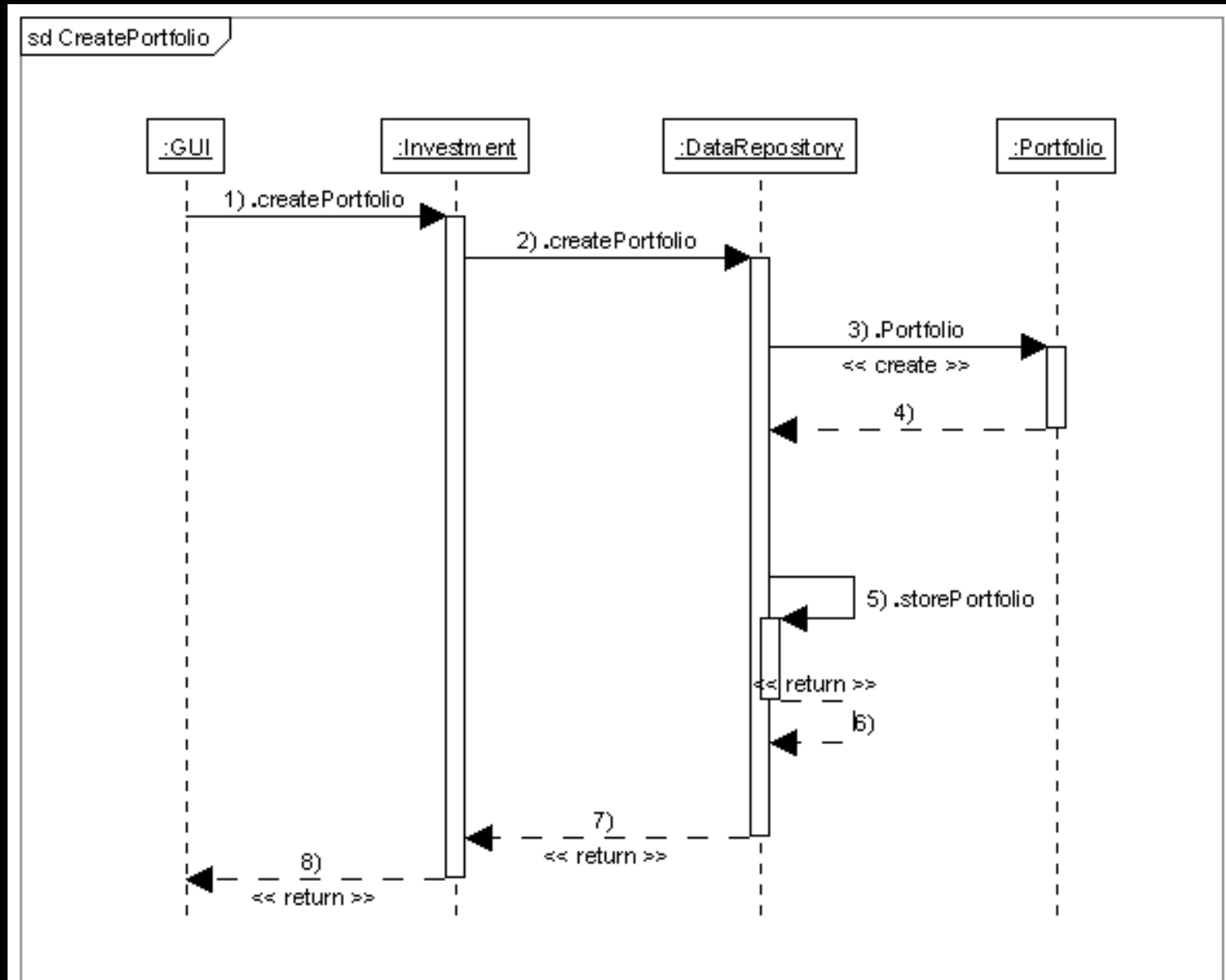


## Example OO Design – PIMS... Basic Actions

<b>Actions</b>
Create/Delete/Rename Portfolio/Security.
Create/Delete/Edit Transactions.
Calculate <i>Net Worth</i> of Investment/Portfolio/ Security.
Calculate <i>Rate of Investment</i> of a security.
Load Current Prices from the Internet.
Check/Set/Delete Alerts.
Validate User.

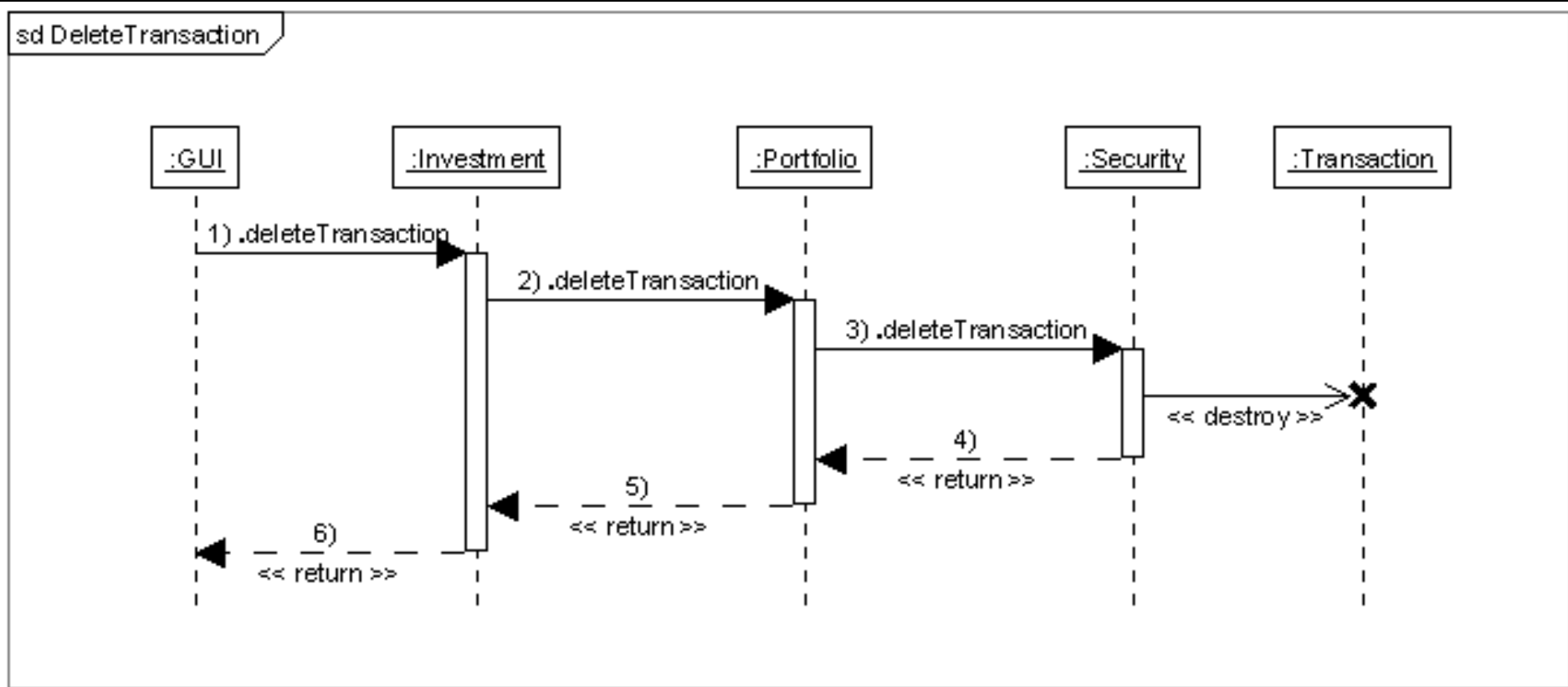
# Example OO Design – PIMS...

## Sequence diagram for principle action Create Portfolio



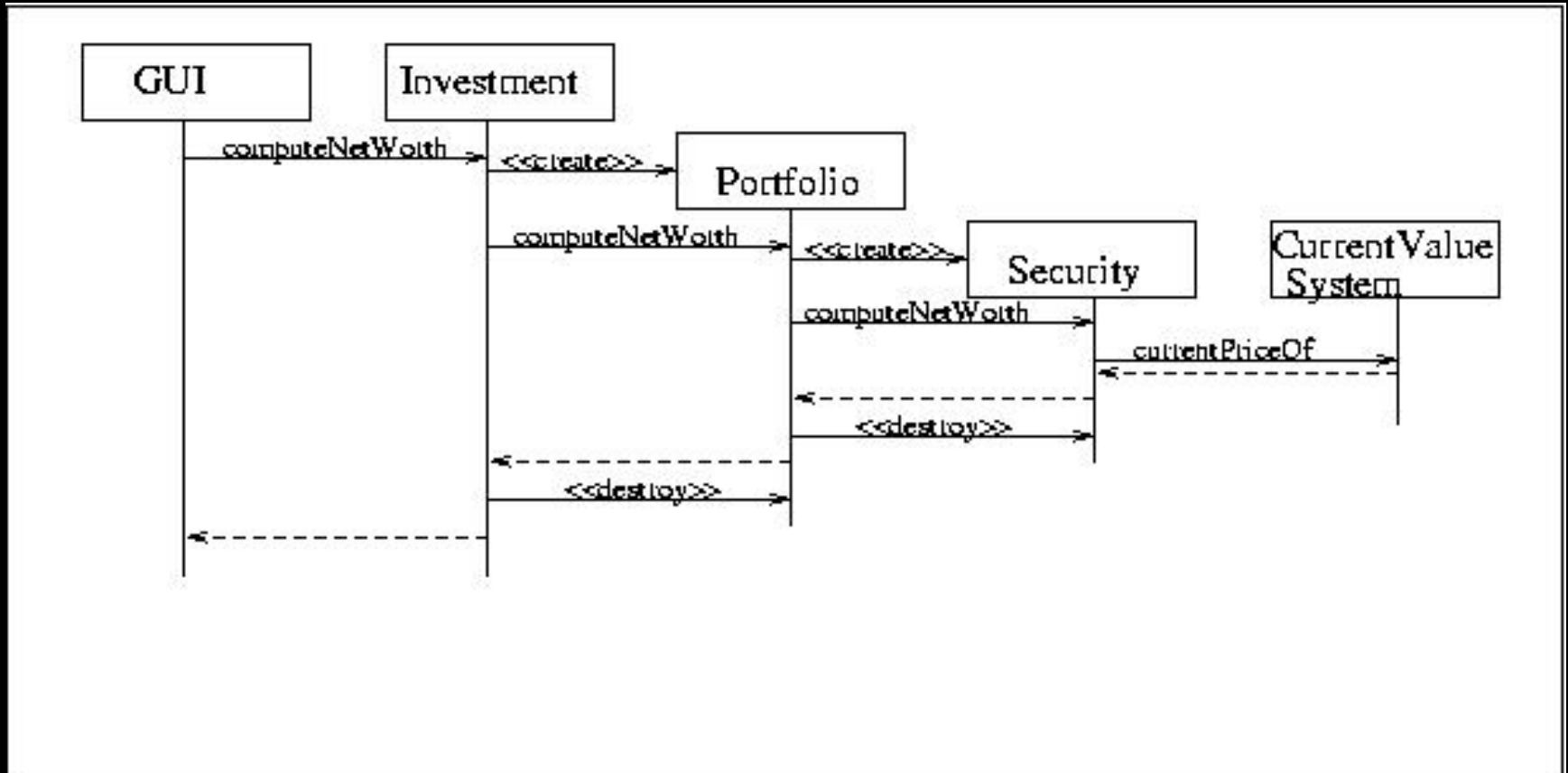
# Example OO Design – PIMS...

## Sequence diagram for principle action Delete Transaction



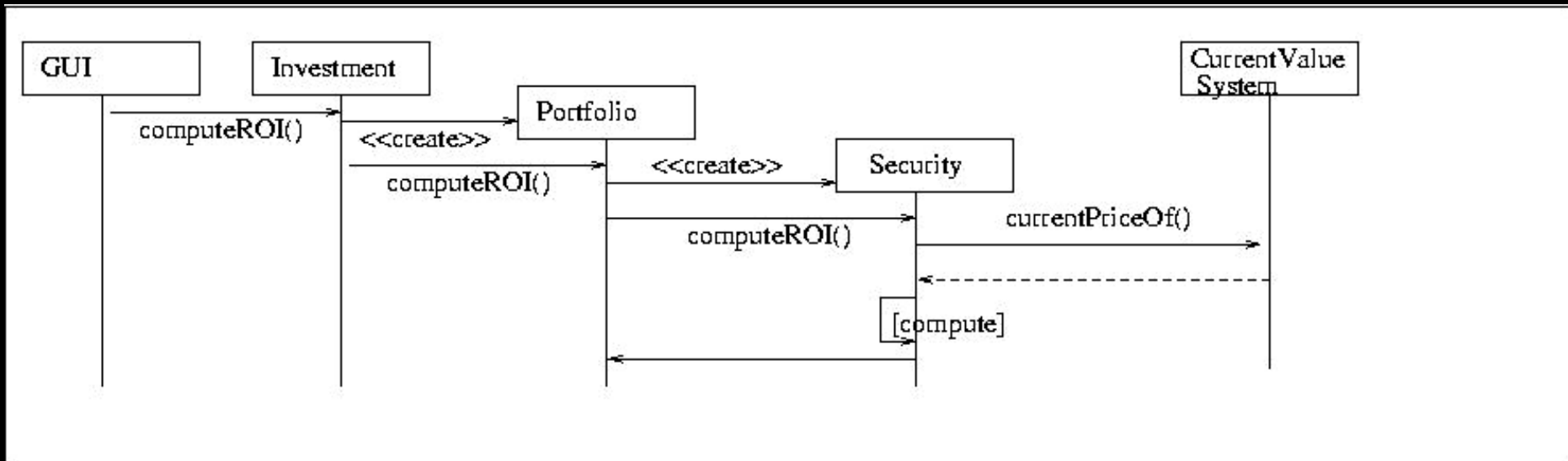
# Example OO Design – PIMS...

## Sequence diagram for action Compute Net Worth of Investment/Portfolio/Security



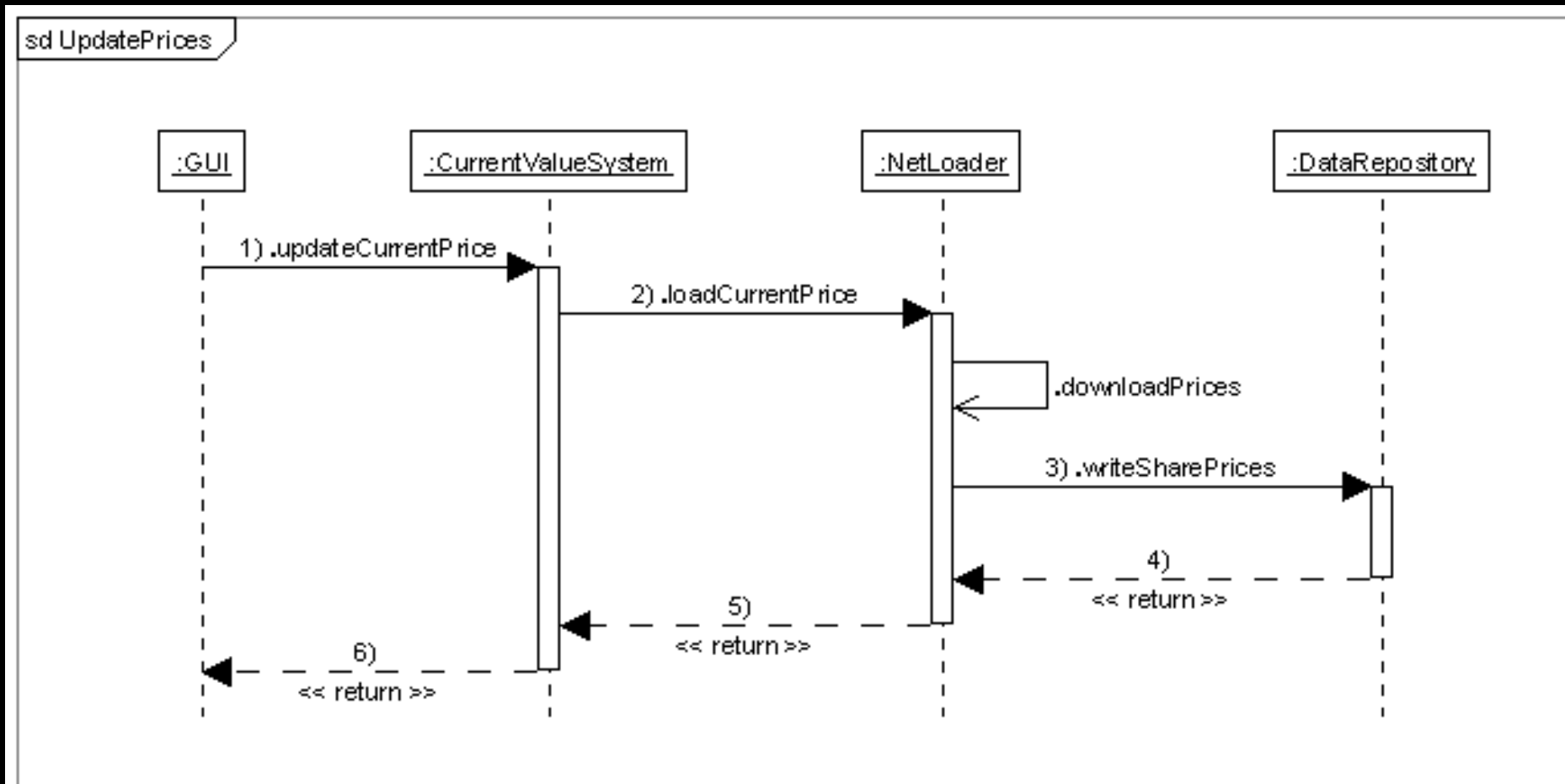
# Example OO Design – PIMS...

## Sequence diagram for action Compute ROI



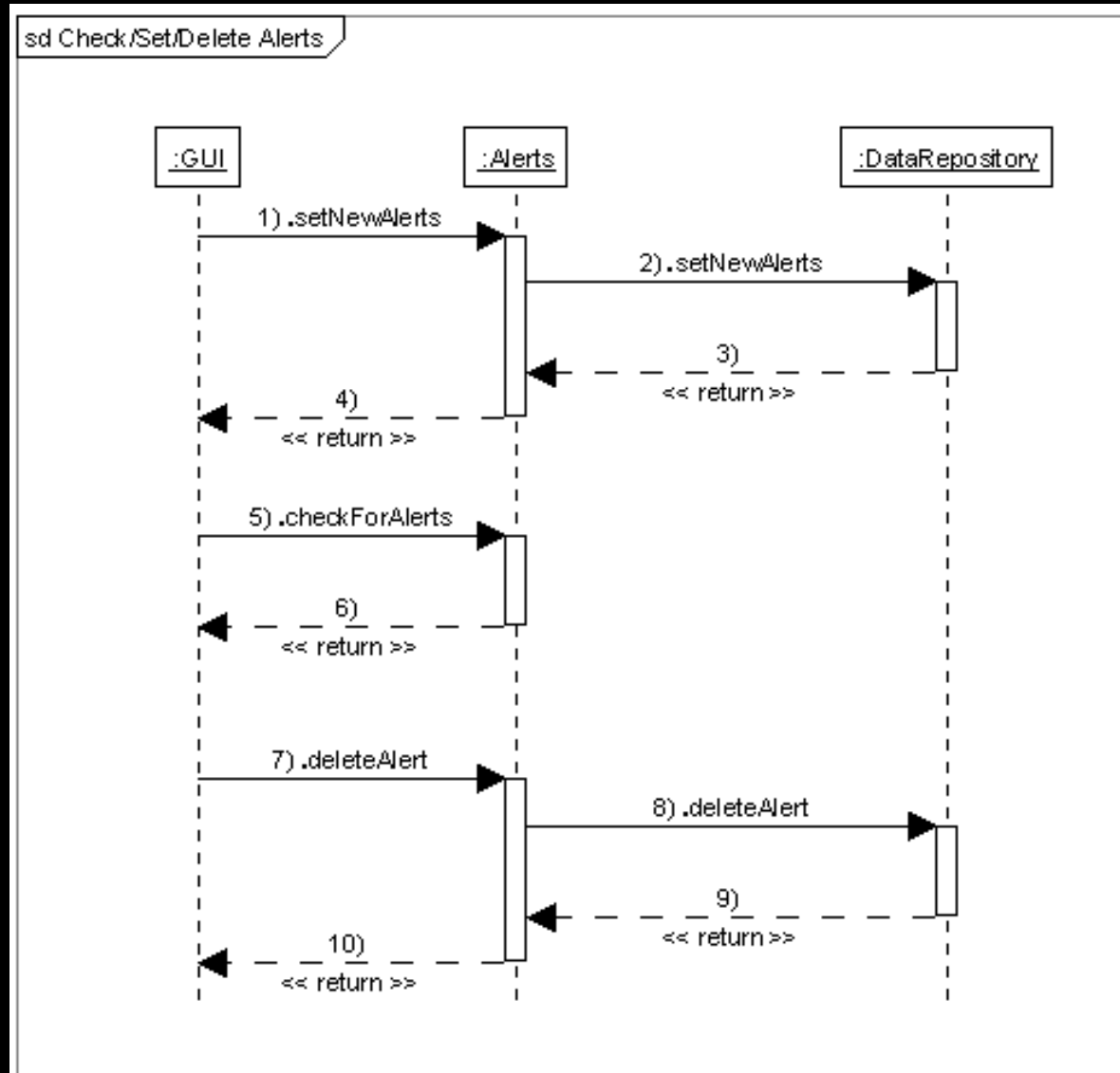
# Example OO Design – PIMS...

## Sequence diagram for action Load current prices from the Internet



# Example OO Design – PIMS...

## Sequence diagram for action Set/Check/Delete Alerts



# Example OO Design – PIMS...

## Sequence diagram for action Validate User

