

## Assignment IV – Amos II Database Project

### Stock Portfolio

#### 1. Goals

The goal of this exercise is to give a practical experience in developing of a small database application using an object-relational database management system. Very few commercial systems exist, but most large relational database vendors have started to introduce extensions to their current products or new object-relational database systems. In this assignment the students will work with the AMOS II object-relational DBMS, which is a research prototype system being developed at Uppsala Database Laboratory, Uppsala University.

The exercise consists of the development of a small *stock portfolio database application* for storing and retrieving information about stocks, writing schema definitions and queries in AMOSQL, the query language of AMOS II.

#### 2. Preparations

Download AMOS II from <http://user.it.uu.se/~udbl/amos/>. Install the system on your PC.

Write your solutions on paper before testing them out on the AMOS II system.

#### 3. Background reading

- Elmasri/Navathe: chapter 20, 21 and 22
- Padron-McCarthy/Risch: chapter 16
- All material from the lectures on object-oriented and object-relational databases systems and query languages. See also the lab course web page for additional information.

#### 4. Instructions for the assignment

The exercise consists of 2 parts:

- 1.) Work through the AMOS II tutorial that is part of the AMOS II archive to download.
- 2.) Develop a small stock portfolio database application to handle personal portfolios. Your test data should include at least 2 different stocks (to be selected individually or by using test data available in the course material) and one index such as Affärsvärldens Generalindex. Data should cover at least two weeks and could be collected from any newspaper.

The data collected for each stock should at least include stock prices (buy, sell, latest, high-est, lowest), price change(+/-), dividend, dividend in percent (sv. direktavkastning), and date. Index data should include name and daily values.

For each purchases of the portfolio owner you need to store the stock, the number of stock shares bought, when they where bought, and for what price. At least one protfolio should contain purchases of two stocks, and shares of one of them should be bought at least twice at different dates.

Specify the following queries:

1. What days did a stock have a positive (or negative) price change.
2. What has been the difference between buy and sell price for a stock for each day in a period

of time.

3. What is the values of the stocks in a portfolio at a given date.
4. What is the current value of a whole portfolio. Consider the value for the latest day in the database as a current value.
5. Development of single stocks of a potfolio and a portfolio in SEK, percentage, and in comparison to some index. The development is taken in regard to some period of time.
6. Compare development of one stock to another.

Any additional and interesting queries are welcome. NOTE: At least two such additional queries should be defined.

**Hints:**

The development of stock in SEK is the difference of prices for the last and first days in a period.

The development of portfolio in SEK is the difference of values for the last and first days in a period.

The development in percentage is the ratio between the development in SEK and the price (value) for the first day in the period.

**5. Handing in**

Hand in an overview of the design, e.g. in an EER diagram, including explanations of concepts and symbols. Include solutions to all the questions in the exercise as a printout of the interaction with AMOS II. This can be done by copying the results from the window where you are running AMOS II into a text file that you print out and hand-in to your assistant. You do not have to hand in the answers of the tutorial exercises.