

## Exercises for DW & DM

### Sheet 4 (until 30.04.2008)

Please note that you need **50%** of all exercise points to be admitted for the final exams. Exercises have to be turned in until **Thursday** before the next lecture and should be completed in teams of two students each. Write both names and “Matrikelnummer” on each page. If you have multiple pages, staple them together! Please hand in your solutions on **paper** into the mailbox at the IFIS floor or to our secretary (Mühlenpfordtstraße 23, 2<sup>nd</sup> floor). You may answer in either German or English.

#### Exercise 1 (10P)

1. Briefly present the Query processor and its component parts. (1P)
2. Considering a database structure as in Annex 1,
  - a. Construct an SQL query which returns the profit, the quantity and the average price of sold UMTS mobile phones this year, in Europe. (3P)
  - b. For the query you have written in 2.a, construct and draw the operator tree written in relational algebra. (If you don't know how to build an operator tree, read [http://wwwalt.ifis.cs.tu-bs.de/html\\_d/sose2008/rdb2/RDB2\\_06\\_QueryOpt1.pdf](http://wwwalt.ifis.cs.tu-bs.de/html_d/sose2008/rdb2/RDB2_06_QueryOpt1.pdf)). (3P)
  - c. Apply the Hill Climbing technique on the operator tree from 2.b and draw the resulting optimized tree. (You can find information about Hill Climbing at [http://wwwalt.ifis.cs.tu-bs.de/html\\_d/sose2008/rdb2/RDB2\\_07\\_QueryOpt2.pdf](http://wwwalt.ifis.cs.tu-bs.de/html_d/sose2008/rdb2/RDB2_07_QueryOpt2.pdf)). (3P)

#### Exercise 2 (8P)

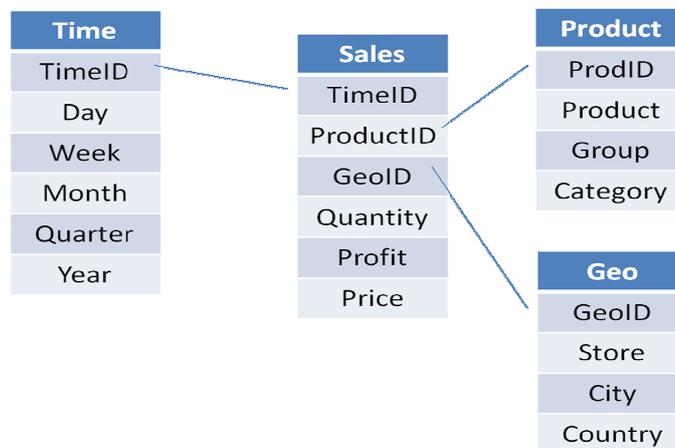
1. Prof. Codd has presented 4 types of OLAP analysis models in his rules. What is the purpose of each type? (2P)
2. Considering the mE/R in Annex 2,
  - a. Apply a Roll-up operation on the Geographical dimension and explain the result. (3P)
  - b. Apply a Drill-down on the Time dimension. (3P)

#### Exercise 3 (7P)

1. What is a multidimensional database? (2P)

- Briefly explain (1,2 sentences) what the MOLAP and ROLAP physical models stand for. (2P)
- You have to build a DW for a company. Present at least 3 questions you would ask the users of the future DW, in order to establish which physical model you will use. (3P)

**Annex 1:**



**Annex 2:**

