Prof. Dr. Gunter Saake
Department of Technical and Business Information Systems
Workgroup Databases & Software Engineering

# Database Concepts

## Exercise 9

1. Express following queries in SQL!

   (a) Get the names of all costumers.

   (b) Get all orders of customer Meier.

   (c) List all products that have not been sold on 13.05.2003.

   (d) List all products that dealer Meier sold to customer Schulze.

   (e) Get all products that dealer Meier sold and customer Schulze bought.

Customer

| Cid | Name |
|---|---|
| 13 | M.Mueller |
| 17 | A.Meier |
| 23 | I.Schulze |

Dealer

| Did | Name |
|---|---|
| 5 | G.Hals |
| 7 | P.Schmidt |
| 11 | E.Meier |
| 13 | E.Mueller |

Product

| Pid | Label |
|---|---|
| 45 | Power adapter |
| 57 | Cat5 cable |
| 67 | Mainboard |

offers

| Did | Pid |
|---|---|
| 5 | 45 |
| 5 | 57 |
| 7 | 67 |
| 7 | 45 |
| 11 | 57 |
| 5 | 67 |
| 11 | 67 |

Orders

| Oid | Did | Date | Cid |
|---|---|---|---|
| 3 | 7 | 01.12.2002 | 17 |
| 5 | 11 | 27.04.2003 | 23 |
| 7 | 5 | 13.05.2003 | 17 |
| 10 | 5 | 01.09.2003 | 13 |

line_item

| Oid | Pid | Amount |
|---|---|---|
| 3 | 45 | 1 |
| 3 | 67 | 5 |
| 5 | 67 | 1 |
| 7 | 57 | 3 |
| 7 | 67 | 2 |
| 10 | 45 | 2 |
| 10 | 57 | 5 |
| 10 | 67 | 3 |

2. Convert the SQL schema from task 1 into an ER-schema.

3. Given following tables:

| Name | Pid |
|---|---|
| Meier | 1586 |
| Mueller | 1001 |
| Schmidt | 905 |

| Pid | Salary |
|---|---|
| 1586 | 4000 |
| 1235 | 2500 |
| 905 | 1000 |
| 512 | 1575 |

Join the tables using a

(a) Natural-Join

(b) Left-Outer-Join

(c) Right-Outer-Join

(d) Full-Outer-Join

4. Given following tables:

| Date | Orders |
|---|---|
| 02.09.03 | Furniture |
| 23.06.04 | Vegetables |
| 01.12.05 | Pots |
| 15.01.06 | Cutlery |

| Date | Value |
|---|---|
| 02.09.03 | 4000€ |
| 23.06.04 | 100€ |
| 01.12.05 | 500€ |

Join the tables using

(a) Equi-Join ($\bowtie_{Date=Date}$)

(b) Theta-Join ($\bowtie_{Date>Date}$)

(c) Semi-Join ($\ltimes$)

5. To solve this task, use recursive SQL as it is defined by Oracle (and lecture):

| Id | Name | Manager |
|---|---|---|
| 1 | Amy Teipist | 3 |
| 2 | Tom Owner | NULL |
| 3 | Tim Managor | 7 |
| 4 | John Clerk | 3 |
| 5 | Juli Sal | 2 |
| 6 | Paul Meier | 3 |
| 7 | Don Boss | 2 |
| 8 | Rob Marketor | 5 |

(a) When and why is recursive SQL necessary?

(b) Create an SQL query that returns all direct managers of Paul Meier!

(c) Create an SQL query that returns all direct and indirect managers of Paul Meier.

**Good Luck!**