

Course: MCTE 630 – Database Systems
Subject: Homework #1
Task: Problems from text:
 The Concepts of Database Management
 Pratt & Adamski (1997)
Task: Problems from text:
 A Guide to SQL: featuring ORACLE
 Pratt (1998)
Professor: Dr. Maxine Cohen
Student: Leanne C. Boyd
Usercode: boydl
Email: boydl@scis.acast.nova.edu
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HOMEWORK #1

CONCEPTS OF DATABASE MANAGEMENT:

Chapter 1 # 4, 8, 18

4) What is a one-to-many relationship? Give two examples of entities that have one-to-many relationships.

In the database environment, there are concepts and terms that are very important. One of these terms is “relationship.” This refers to the associations found between “entities,” which are the noun-like items such as persons, places, things, or events. In a one-to-many relationship, *one* entity is related in some fashion to *many* entities. Examples of the one-to-many relationship would be:

- a) The teacher of our course, Maxine Cohen, has a one-to-many relationship with the students in the class. If a classroom situation such as the ECR were in use, this relationship would reveal an association of one-to-twenty, if 20 students were online. If Maxine’s email wasn’t properly sent by the Nova system, the ECR relationship might easily be one-to-zero, as nobody knew of the meeting! Either way, the -0- to 20 students are related to ONE (1) teacher. The one-to-many relationship can mean an association of one entity to zero, one, or many other entities.
- b) My parents own a small publishing house, and have publishing agreements with approximately 40 authors. They have a one-to-many relationship with all of these authors, which would be one-to-forty. However, at any given time, the house is actively printing one, two or sometimes three new books or reprints. This would put their business in a relationship of one-to-one, one-to-two, or one-to-three, but all three examples would still be samples of the one-to-many relationship. There are still -0- to [up to] 40 authors related to the ONE publishing business.



8) How is it possible to get more information from the same amount of data through using a database approach as opposed to a file approach?

A file, or data file, in the computer environment, is similar to a file folder in a cabinet. It might store a bit of information, or it might store an incredibly large amount. The important fact is that a file stores information concerning only a single entity. A database stores information on more than one entity, and possibly will store information on thousands or millions of entities. If we are using a file approach, we are limited to the information that is stored for the single item. However, in the database approach, we have hugely expanded abilities to study the relationships of the information in a single file, with the information stored for countless other singles files. This, then, allows for the computer user to begin with the same limited information of a file, and expand his knowledge of its relationship in terms of comparison of selected criteria such as description, derivation, uses for the item, history, etc. Furthermore, the database approach offers information from its search capabilities without the user needing to seek out every individual item. The database approach greatly expands the user's outcome and knowledge.



18) Why can a failure in a database environment be more serious than one in a file environment?

In a file environment, the user is an individual, utilizing a single system. In the database environment, the database is accessed by many users in a networked system. If there is a failure in a single user's computer, it only affects the one user. If there is a failure in the database itself or in its networked components, this will adversely affect every user connected in the network. It should also be considered that the database is much more complex than the single computer/file environment. Many users are connected to it, with changes being made at a consistent rate. When failure occurs, it immediately makes the loss of MUCH information possible, instead of just the work of one person. Therefore, the recovery process is much more difficult, with the possibility of some information being lost altogether. The system has to be taken back to a point where it was last known to be correct in order to begin restoring it, which can be a very complex procedure. Finally, the sheer size of a database compared to a single computer allows that database failure may cause the loss of much more information.

CONCEPTS OF DATABASE MANAGEMENT:

Chapter 2 #10-18 (even), 20-22

[Questions 10 through 19 are based on the Premiere Products database (Figure 2.2). In each case, indicate how you could use QBE to obtain the desired results.]

10) List the number and name of all sales reps.

<u>SLSREP_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>
03	Jones	Mary
06	Smith	William
12	Diaz	Miguel

Using QBE: ****Identify the SALES_REP table. Place check marks in the boxes for FIRST, LAST, and SLSREP_NUMBER columns, and run the query. The query results will show the sales rep names and numbers.**

****Note to Maxine:**

A real simple logistic of this text caused me no end of initial grief. Because we do not have access to this software at Nova, there must be some things that the student must take for a given, when they are not fully explained by the textbook. I ran an Internet search on Paradox, and quickly found that the current version is 8.0. However, this has been sold by Paradox, to Corel. The earlier versions, from 7-down are still available on the Paradox site. My search included the hope that Paradox had a trial or demo version available, so that this software for Windows '95 could be experienced first-hand. It appears that no such "freebie" is available.

THEREFORE: When the text states that you must "identify the table you wish to query" (Concepts, p. 33), and the Figures show that the far-left choice-box lists CUSTOMER.db, ORDERS.db, etc., but it does not explain how you are to identify it – then I have surmised that a standard Windows '95 method is probably used in opening the table in question. I find it frustrating that the text has omitted such a basic first step! When the student doesn't have the actual software for reference, this is information that most definitely should have been used as the first instruction. I therefore am guessing that the method is to open from the top menu bar, under FILE, and choose OPEN; OR, under QUERY, the .db files are listed. I hope one of my guesses is correct!



12) List the number and name of all customers represented by sales rep 03.

<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>	<u>SLSREP_</u> <u>NUMBER</u>
124	Adams	Sally	03
412	Adams	Sally	03
622	Martin	Dan	03

Using QBE: In the CUSTOMER query form, place check marks in the CUSTOMER_NUMBER, LAST, and FIRST columns. Then, you type "03" in the SLSREP_NUMBER field. The results will show that customers 124, 412, and 622 have rep 03 as their sales rep, and will give you their first and last names.



14) List the number and name of all customers who are represented by sales rep 03 or whose credit limit is \$1,000.

<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>	<u>SLSREP_</u> <u>NUMBER</u>	<u>CREDIT_</u> <u>LIMIT</u>
124	Adams	Sally	03	\$1000
311	Charles	Don	12	\$1000
412	Adams	Sally	03	\$2000
587	Galvez	Mara	06	\$1000
622	Martin	Dan	03	\$1000

(continued)

Using QBE: For this query, you are seeking conditions with an “OR” between them. This makes it necessary to combine conditions to create a compound condition. You place the conditions on different rows in the query when seeking an “OR” condition. Place check marks in the CUSTOMER_NUMBER, FIRST, and LAST columns in the first row, and type 03 in the field next to SLSREP_NUMBER. On the next row, place a check mark in the CUSTOMER_NUMBER, FIRST, and LAST columns, and type 1000 in the field next to CREDIT_LIMIT. The first row will give the customers for rep 03, and the second row will give the customers with a credit limit of \$1000. The combined results of the query bring back 5 customer names and numbers.



16) List the number and name of all customers who are represented by Mary Jones.

<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>	<u>SLSREP_</u> <u>NUMBER</u>	<u>LAST 1</u>	<u>FIRST 1</u>
124	Adams	Sally	03	Jones	Mary
412	Adams	Sally	03	Jones	Mary
622	Martin	Dan	03	Jones	Mary

Using QBE: This query can't be satisfied using a single table. The customer names and numbers and rep numbers are in the CUSTOMER table, but the correlation between rep number and rep name is found in the SALES_REP table. The tables must be joined. Bring both tables to the screen. In the CUSTOMER query form, place check marks next to CUSTOMER_NUMBER, FIRST, and LAST. In the SALES_REP query form, type in “Mary” in the field next to FIRST, and “Jones” in the field next to LAST. Now, the tables must be combined by matching values in corresponding columns. Type “join1” in the CUSTOMER query form, in the field next to SLSREP_NUMBER. Type “join1” in the SALES_REP query form, in the field next to SLSREP_NUMBER. The query results will show the customers' names as FIRST and LAST, and the reps' names as FIRST_1 and LAST_1, as there are 2 sets of these. The results will show three customers for Mary Jones.



18) Find the total of the balances for all the customers represented by sales rep 12.

<u>SLSREP_</u> <u>NUMBER</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>BALANCE</u>
12	311	\$825.75
12	405	\$402.75
12	522	\$98.75
		\$1,327.25 TOTAL OF BALANCES

Using QBE: This query requires that you find rep 12's customers, and their balances. It then requires a sum total of those balances. In the CUSTOMER query form, type “12” in the field next to the SLSREP_NUMBER column. A **built-in function** will be used; this one, “Sum,” is preceded by the operator “calc” in the Paradox version of QBE. In the BALANCE column, type “calc sum” in the field next to it. The example asks for the total of the balances for all of rep 12's customers. I felt it necessary to list the customer number only, for rep 12's customers. The answer to the query will be found in the column “Sum of BALANCE,” and will be \$1,327.25.



[Questions 20 through 22 also are based on the Premiere Products database (Figure 2.2). In each case, indicate how you could use the relational algebra to obtain the desired results.]

20) List the number and name of all sales reps.

<u>SLSREP</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>
03	Jones	Mary
06	Smith	William
12	Diaz	Miguel

Using the relational algebra: You will use the PROJECT command, as this causes certain columns (vertical subsets of a table) to be represented in the new table. You would write the command:

```
PROJECT SALES_REP OVER (SLSREP_NUMBER, FIRST, LAST)
GIVING ANSWER
```



21) List all information from the PART table concerning part BT04.

<u>PART_</u> <u>NUMBER</u>	<u>PART_</u> <u>DESCRIPTION</u>	<u>UNITS_</u> <u>ON HAND</u>	<u>ITEM_</u> <u>CLASS</u>	<u>WAREHOUSE_</u> <u>NUMBER</u>	<u>UNIT_</u> <u>PRICE</u>
BT04	Gas Grill	11	AP	2	\$149.99

Using the relational algebra: This command will create a new table called ANSWER, which will contain all the columns from the PART table, but for only one single row, which is the row for part BT04. You would write the command:

```
SELECT PART WHERE PART_NUMBER = BT04
GIVING ANSWER
```



22) List the order number, order date, customer number, last name, and first name for each order.

<u>ORDER_</u> <u>NUMBER</u>	<u>ORDER_</u> <u>DATE</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>
12489	9/02/98	124	Adams	Sally
12491	9/02/98	311	Charles	Don
12494	9/04/98	315	Daniels	Tom
12495	9/04/98	256	Samuels	Ann
12498	9/05/98	522	Nelson	Mary
12500	9/05/98	124	Adams	Sally
12504	9/05/98	522	Nelson	Mary

(continued)

Using the relational algebra: This requires the use of the JOIN operation, which will allow you to pull together the data needed from the CUSTOMER and ORDER tables. The command will be written:

```

JOIN ORDER
  WHERE ORDER.CUSTOMER_NUMBER =
        CUSTOMER.CUSTOMER_NUMBER
GIVING TEMP
PROJECT TEMP OVER (ORDER_NUMBER, ORDER_DATE,
                  CUSTOMER_NUMBER, LAST, FIRST)
GIVING ANSWER
    
```



GUIDE TO SQL: FEATURING ORACLE

Chapter 1

Premier Products: #2-10 (even)

- 2) Give the order numbers of those orders placed by customer 124 on September 5, 1998.

<u>ORDER_</u> <u>NUMBER</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>ORDER_</u> <u>DATE</u>
12500	124	9/05/98



- 4) Find the number and name of each customer whose last name is Nelson.

<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>
522	Nelson	Mary



- 6) Find the total balance for all the customers represented by sales rep 12.

<u>SLSREP_</u> <u>NUMBER</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>BALANCE</u>
12	311	\$825.75
12	405	\$402.75
12	522	\$98.75
		\$1,327.25 TOTAL BALANCE



- 8) For each order placed on September 5, 1998, list the order number, order date, customer number, and customer name.

<u>ORDER_</u> <u>NUMBER</u>	<u>ORDER_</u> <u>DATE</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>
12498	9/05/98	522	Nelson	Mary
12500	9/05/98	124	Adams	Sally
12504	9/05/98	522	Nelson	Mary



- 10) For each order, list the order number, order date, customer number, customer name, along with the number and name of the sales rep who represents the customer.

<u>ORDER_</u> <u>NUMBER</u>	<u>ORDER_</u> <u>DATE</u>	<u>CUSTOMER_</u> <u>NUMBER</u>	<u>LAST</u>	<u>FIRST</u>	<u>SLSREP_</u> <u>NUMBER</u>	<u>LAST 1</u>	<u>FIRST 1</u>
12489	9/02/98	124	Adams	Sally	03	Jones	Mary
12491	9/02/98	311	Charles	Don	12	Diaz	Miguel
12494	9/04/98	315	Daniels	Tom	06	Smith	William
12495	9/04/98	256	Samuels	Ann	06	Smith	William
12498	9/05/98	522	Nelson	Mary	12	Diaz	Miguel
12500	9/05/98	124	Adams	Sally	03	Jones	Mary
12504	9/05/98	522	Nelson	Mary	12	Diaz	Miguel



GUIDE TO SQL: FEATURING ORACLE

Chapter 1

Henry's Books: #2-12 (even)

- 2) List the name of each branch that has at least 10 employees.

<u>BRANCH_</u> <u>NAME</u>	<u>NUMBER</u> <u>EMPLOYEES</u>
Henry Downtown	10
Henry Brentwood	15



- 4) List the code and title of each book whose type is HOR and is in paperback.

<u>BOOK_</u> <u>CODE</u>	<u>BOOK_</u> <u>TITLE</u>	<u>BOOK_</u> <u>TYPE</u>	<u>PAPERBACK</u>
1351	Cujo	HOR	Y
7443	Carrie	HOR	Y



- 6) List the code and title of each paperback book whose type is ART and whose price is less than \$12.00.

<u>BOOK_</u> <u>CODE</u>	<u>BOOK_</u> <u>TITLE</u>	<u>BOOK_</u> <u>TYPE</u>	<u>PAPERBACK</u>	<u>BOOK_</u> <u>PRICE</u>
1382	Marcel Duchamp	ART	Y	\$11.25



- 8) Find the code and name of each publisher for which the word “and” is contained somewhere within the publisher name.

<u>PUBLISHER_</u> <u>CODE</u>	<u>PUBLISHER_</u> <u>NAME</u>
BF	Best and Furrow
MP	McPherson and Co.
TH	Thames and Hudson
WN	W.W. Norton and Co.



- 10) How many books are of type MYS?

<u>BOOK_</u> <u>TITLE</u>	<u>BOOK_</u> <u>TYPE</u>	<u>BOOK_</u> <u>CODE</u>	<u>BRANCH_</u> <u>NUMBER</u>	<u>UNITS_</u> <u>ON HAND</u>
Smokescreen	MYS	079X	2	1
Smokescreen	MYS	079X	3	2
Smokescreen	MYS	079X	4	3
Knockdown	MYS	0808	--	--
Death on the Nile	MYS	138X	2	3
Evil Under the Sun	MYS	6128	2	4
Evil Under the Sun	MYS	6128	3	3

There are 4 book *titles* of type MYS.

There are 16 total “units on hand” of type MYS, in all the branches.



(continued)

12) For each book, list the book code, title, publisher code, and publisher name.

<u>BOOK_</u> <u>CODE</u>	<u>BOOK_</u> <u>TITLE</u>	<u>PUBLISHER_</u> <u>CODE</u>	<u>PUBLISHER_</u> <u>NAME</u>
0180	Shyness	BB	Bantam Books
0189	Kane and Abel	PB	Pocket Books
0200	Stranger	BB	Bantam Books
0378	Dunwich Horror and Others	PB	Pocket Books
079X	Smokescreen	PB	Pocket Books
0808	Knockdown	PB	Pocket Books
1351	Cujo	SI	Signet
1382	Marcel Duchamp	PB	Pocket Books
138X	Death on the Nile	BB	Bantam Books
2226	Ghost from the Grand Banks	BB	Bantam Books
2281	Prints of the 20th Century	PB	Pocket Books
2766	Prodigal Daughter	PB	Pocket Books
2908	Hymns to the Night	BB	Bantam Books
3350	Higher Creativity	PB	Pocket Books
3743	First Among Equals	PB	Pocket Books
3906	Vortex	BB	Bantam Books
5163	Organ	SI	Signet
5790	Database Systems	BF	Best and Furrow
6128	Evil Under the Sun	PB	Pocket Books
6328	Vixen 07	BB	Bantam Books
669X	A Guide to SQL	BF	Best and Furrow
6908	DOS Essentials	BF	Best and Furrow
7405	Night Probe	BB	Bantam Books
7443	Carrie	SI	Signet
7559	Risk	PB	Pocket Books
7947	dBASE Programming	BF	Best and Furrow
8092	Magritte	SI	Signet
8720	Castle	BB	Bantam Books
9611	Amerika	BB	Bantam Books