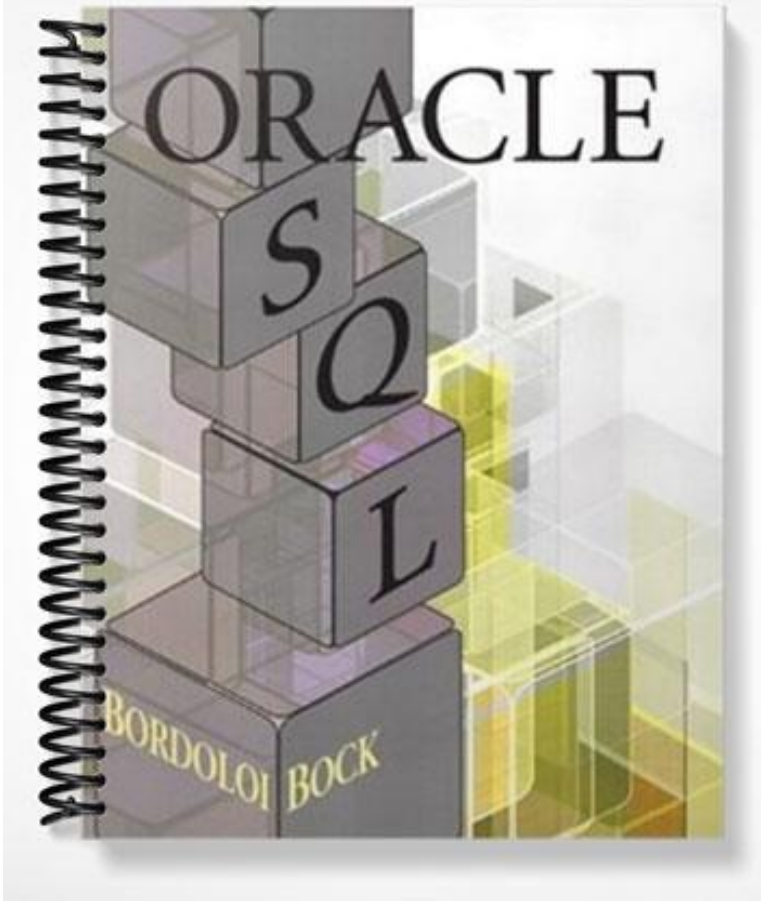
SOLUTIONS MANUAL



Solutions Manual

End-of-Chapter Exercise Solutions

Chapter 1 Introduction

Concepts Quiz

1. **User data**: Data that must be stored by an organization. User data includes all information relevant to an organization's computer software applications. **System data**: Data the database needs to manage user data and to manage itself.

2. This is also termed *metadata*, or data about data.

3. Conceptually, a relational database stores data in the form of tables.

4. The characteristics of a relational database are:
   - it is data-driven, not design-driven.
   - the data are self describing.
   - consistency of data values is maintained among all applications.
   - rules are defined and enforced regarding how data values are stored.

5. A DBMS is complete software for the management of a database. It provides the following services:
   - data definition for defining and storing all of the objects that comprise a database such as tables and indexes.
   - data maintenance for maintaining rows (records) for each table in a database.
   - data manipulation for inserting, updating, and sorting data in a database.
   - data display for optionally providing some method of displaying the data for the user.
   - data integrity for ensuring the accuracy of the data.
   - data security for ensuring that only authorized information system users can access specific pieces of data.
   - database backup and recovery to automate the backup of important organizational data and to support recovery operations in the event of some type of systems failure.

6. The significant features of SQL Server 2000 are:

Feature	Description
Internet standard support	SQL Server uses Microsoft's new .NET technology to support data exchange across the Internet including new detailed support for the extensible-markup language, or XML.
Scalability	SQL Server can be used to build very large, multiprocessor systems.
Security mechanisms	SQL Server's sophisticated security mechanisms control access to sensitive data through an assortment of privileges, for example, the privilege to read or write specific information within a database.
Backup and recovery	SQL Server's sophisticated backup and recovery programs minimize data loss and downtime if problems arise.
Space management	SQL Server's automated space management capabilities makes it easy for a database administrator to manage disk space for storage. These capabilities also include the ability to

	specify subsequent allocations on how much disk space to set aside for future requirements.
Open connectivity	SQL Server's open connectivity functionality provides uninterrupted access to the database throughout the day. It also provides open connectivity to and from other vendors' software.
Tools and applications	SQL Server provides a wide range of development tools, end-user query tools, and support for third-party software applications that are used to model business processes and data and to generate program language code automatically.

7. Only *Weekly_4* is suitable for a column name. This name follows the naming guidelines for SQL Server 2000. *First Name* is unsuitable because there is a blank space in the column name unless the name is enclosed within square brackets. The name *&Salary* is unsuitable because it begins with a special character not in the list of allowable special characters. *Select* is unsuitable because it is a SQL reserved word.

8. A DDL can be used to create and define objects in a database. This also includes dropping and altering objects, and granting and revoking privileges on a database object.

9. A DML can be used to manipulate the data in a database. This includes inserting, updating, and deleting rows in tables, as well as selecting rows from database tables.

10. With procedural languages such as COBOL or C++, the database user has to specify how the DBMS is to complete a task. Nonprocedural means that the database user only has to specify the task for the DBMS to complete, but not how the task is to be completed.

SQL Coding Exercises and Questions – Company Database

1. It is the primary statement in SQL that is used to query, or extract information from a database.

2. A WHERE clause in a SELECT statement is used to select a subset of rows. It can also be used to complete legacy inner join operations.

3. You simply list the columns from the table(s) to be displayed. The columns are listed in the order in which they are displayed.

4. A JOIN operation.

5. A comma is used between column names as well as table names.

6. It is important to learn how to interpret syntax and structure examples. It is essential to understand that braces surround mandatory options. In addition, a vertical bar indicates that only one option must be chosen, whereas, a comma indicates that one or both options can be chosen. Brackets surround optional keywords or identifiers.

7. Using upper-case or lower-case commands has NO effect. However, by convention, we type commands and clauses such as SELECT, FROM, and WHERE in UPPER case and column names, table names, and conditions in LOWER case.

8. There are several rules for naming database objects that must be followed.

- Identifiers must be no more than 128 characters.

- Identifiers can consist of letters, digits, or the symbols #, @, $, and _ (underscore).
- Temporary tables are named with the pound sign (#) as a prefix. Avoid using this symbol as the leading character when naming application tables.
- T-SQL variables are indicated by using the @ symbol as a prefix. Avoid using this symbol as the leading character when naming other database objects.
- The first character must be either alphabetic (a-z, A-Z) or the @ symbol or _ (underscore).
- After the first character, you may use digits, letters, or the symbols $, #, or _ (underscore).
- No embedded spaces are allowed in identifiers unless you place the identifier name within square brackets ([ ]).
- SQL keywords such as SELECT and WHERE cannot be used as an identifier.

9. The ORDER BY clause.

SQL Coding Exercises and Questions – Riverbend Database

1. The relationship between the *patient* and *patient_note* tables is one-to-many, meaning each patient can have many different patient_note rows in the *patient_note* table.

2.
```
SELECT pat_id, pat_last_name
FROM patient
WHERE pat_last_name = 'Young';

pat_id pat_last_name
------ --------------------------------------------------
100500 Young
```

3.
```
SELECT *
FROM patient
WHERE pat_id = '100306';

pat_id pat_ssn   pat_last_name
pat_first_name                                      pat_middle_name
pat_street_address                                  pat_city
pat_state pat_zip   pat_date_of_birth
pat_telephone_number bed_number
------ --------- -------------------------------------------------- ---
---------------------------------------- ----------------------
-------------------------- ----------------------------------------
------- -------------------------------------------------- --------- --
------- -------------------------------------------------- --------
------------ ----------
100306 222333306 Santiago
Samuel                                              Sampson
Southwest Drive #22                                 Edwardsville
IL        62025     1984-06-07 00:00:00.000
1005551039           36
```

4. Each patient may be assigned to one bed, but they may not be assigned to a bed (out-patient). A room may have many beds, but a bed is located in a single room. There may be many beds of a specific bed type, but a bed is categorized as only a single type. Some rooms have no beds. Some bed types are not represented by beds in the hospital.

5.
```
SELECT *
FROM bed_type;
```

```
bed_type_id bed_description
----------- ----------------------------------------------------
E2          Emergency Room-Fixed
E3          Emergency Room-Portable
ER          Emergency Room-Rollaround
P1          Pediatric-Age to 5
P2          Pediatric-Age to 15
R1          Regular Ward-Fixed
R2          Regular Ward-Adjustable
RA          Radiology Dept
RE          Regular Ward-Elevated Leg
SU          Surgery Room-Rollaround
```

6. A ward or department may have zero, one, or more staff members assigned to it, but a staff member is assigned to one and only one ward or department.

7.
```
SELECT ward_id, ward_dept_name
FROM ward_dept;
```

```
ward_id ward_dept_name
------- --------------------------------------------------
ADMI2   Admissions and Records Department
ADMIN   Administrative Processing Department
CARD1   Cardiology Department
CRITC   Critical Care Ward
EMER1   Emergency Room Ward
GYNO1   Gynecological Department
MEDL1   Medical Laboratory Department 1
MEDL2   Medical Laboratory Department 2
MEDS1   Medical Surgical Ward 1
MEDS2   Medical Surgical Ward 2
NEWB1   New Born Nursery Ward
ONCOL   Oncology Ward
OUTP1   Outpatient Clinic Department
PEDS1   Pediatrics Ward
PHARM   Pharmacy Department
RADI1   Radiology Dept
SURG1   Surgical Ward
SURRE   Surgical Recovery Ward
```

8. The relationship is many-to-many, and it is implemented by creating an association table named *staff_medspec*.

9.
```
SELECT staff_id, specialty_code
FROM staff_medspec
WHERE specialty_code = 'RN1';
```

```
staff_id specialty_code
-------- --------------
66444    RN1
67555    RN1
```

10.
```
SELECT *
FROM service_cat;
```

```
service_cat_id service_cat_desc
-------------- --------------------------------------------------
CAR            Cardiology
GYN            Gynecology
INJ            Injections
LAB            Laboratory-General
OF1            Office Department Service Examinations
OLA            Office-Department Laboratory
PRO            Procedures-General
RAD            Radiology
SUR            Surgery
```

11. The relationship is named *treatment*. Information is stored in four tables: *patient*, *staff*, *service*, and *treatment*.

12.
```
SELECT treatment_number, treatment_date, treatment_comments
FROM treatment
WHERE treatment_number = 10;
```

```
treatment_number                                        treatment_date
treatment_comments
---------------  ------------------------------------------------------
---------------------------
10                                              2003-06-10   00:00:00.000
Emergency room screening for breathing problem.
10                                              2003-06-11   00:00:00.000
Eye exam completed.
10                                              2003-06-12   00:00:00.000
Exploratory Thoracic completed.  Reschedule for Thoracic-Lung surgery.
10              2003-06-13 00:00:00.000
```

13. The table is named *prescription*. The other tables with relationships are named *patient*, *staff*, and *medicine*.

14.
```
SELECT medicine_code, med_name_sci, med_name_common
FROM medicine;

medicine_code med_name_sci
med_name_common
------------- ------------------------------------------------- ------
----------------------------------------
9999001       Promethazine
Phenegran
9999002       Meperidine
Demerol
9999003       Diazepam                                          Valium
9999004       Flurazepam
Dalmane
9999005       Potassium Penicillin V                            PenVK
9999006       Ampicillin
Ampicillin
9999007       Hydroxyzine                                       Atarax
9999008       Cyclobenzaprine
Flexeril
```