

Reading

- chapter 6: "Introduction to SQL" (Hoffer, Ramesh, & Topi) from page 243-261
- chapter 5: "Data Definition Language" (Petkovic)
- chapter 7: "Modification of a Table's Contents" (Petkovic)

Assignment:

Chapter 6 (Hoffer, Ramesh, & Topi)

- Problems and Exercises 1,2,3,4,5,6,7,8

1. Write a database description for each of the relations shown, using SQL DDL (shorten, abbreviate, or change any data names, as needed for your SQL version). Assume the following attribute data types:

StudentID (integer, primary key)

StudentName (25 characters)

FacultyID (integer, primary key)

FacultyName (25 characters)

CourseID (8 characters, primary key)

CourseName (15 characters)

DateQualified (date)

SectionNo (integer, primary key)

Semester (7 characters)

A:

```
CREATE TABLE Student_T
  (StudentID    NUMBER(10,0)      NOT NULL,
   StudentName  VARCHAR(25)       NOT NULL,
  CONSTRAINT Student_PK PRIMARY KEY (StudentID));
```

```
CREATE TABLE Faculty_T
  (FacultyID    NUMBER(10,0)      NOT NULL,
   FacultyName  VARCHAR(25)       NOT NULL,
  CONSTRAINT Faculty_PK PRIMARY KEY (FacultyID));
```

```
CREATE TABLE Course_T
  (CourseID     VARCHAR(8)        NOT NULL,
   CourseName   VARCHAR(15)       NOT NULL,
  CONSTRAINT Course_PK PRIMARY KEY (CourseID));
```

```
CREATE TABLE Date_T
  (FacultyID    NUMBER(10,0)      NOT NULL,
   CourseID     VARCHAR(8)        NOT NULL,
   Date         DATE              NOT NULL,
  CONSTRAINT Date_PK1 PRIMARY KEY (FacultyID),
  CONSTRAINT Date_PK2 PRIMARY KEY (CourseID),
  CONSTRAINT Date_FK1 FOREIGN KEY (FacultyID) REFERENCES Faculty_T(FacultyID),
  CONSTRAINT Date_FK2 FOREIGN KEY (CourseID) REFERENCES Course_T(CourseID));
```

```
CREATE TABLE Section_T
  (SectionNo    NUMBER(10,0)      NOT NULL,
   CourseID     VARCHAR(8)        NOT NULL,
   Semester     VARCHAR(7)        NOT NULL,
  CONSTRAINT Section_PK1 PRIMARY KEY (SectionNo),
  CONSTRAINT Section_PK2 PRIMARY KEY (CourseID),
  CONSTRAINT Section_FK FOREIGN KEY (CourseID) REFERENCES Course_T(CourseID));
```

2. Use SQL to define the following view:

StudentID	StudentName
38214	Letersky
54907	Altwater
54907	Altwater
66324	Aiken

A:

```
CREATE VIEW Student_V
SELECT StudentID, StudentName
FROM Student_T;
```

3. Because of referential integrity, before any row can be entered into the SECTION table, the CourseID to be entered must already exist in the COURSE table. Write an SQL assertion that will enforce this constraint.

A:

```
CREATE TABLE Section_T
(SectionNo    NUMBER(10,0)    NOT NULL,
 CourseID     VARCHAR(8)      NOT NULL,
CONSTRAINT Section_PK1 PRIMARY KEY (SectionNo)),
CONSTRAINT Section_PK2 PRIMARY KEY (CourseID)),
CONSTRAINT Section_FK FOREIGN KEY (CourseID)) REFERENCES Course_T(CourseID));
```

4. Write SQL data definition commands for each of the following queries:

a) How would you add an attribute, Class, to the Student table?

A:

```
ALTER TABLE Student_T
ADD COLUMN Class;
```

b) How would you remove the Registration table?

A:

```
DROP TABLE Registration_T;
```

c) How would you change the FacultyName field from 25 characters to 40 characters?

A:

```
ALTER TABLE Faculty_T
ALTER COLUMN FacultyName VARCHAR(40);
```

5. Write SQL commands for the following:

a) Create two different forms of the INSERT command to add a student with a student ID of 65798 and last name Lopez to the Student table.

A:

```
INSERT Student_T VALUES(65798, 'Lopez', 'Green'); (Suppose his first name is Green)
```

```
INSERT Student_T (StudentID, StudentLastName) VALUES(65798, ' Lopez');
```

b) Now write a command that will remove Lopez from the Student table.

A:
DELETE FROM Student_T
WHERE StudentLastName='Lopez';

c) Create an SQL command that will modify the name of course ISM 4212 from Database to Introduction to Relational Databases.

A:
UPDATE Course_T
SET CourseName = 'Introduction to Relational Databases'
WHERE CourseID = 'ISM 4212';

6. Write SQL queries to answer the following questions:

a) Which students have an ID number that is less than 50000?

A:
SELECT StudentID
FROM Student_T
WHERE StudentID < 50000;

b) What is the name of the faculty member whose ID is 4756?

A:
SELECT FacultyName
FROM Faculty_T
WHERE FacultyID =4756;

c) What is the smallest section number used in the first semester of 2008?

A:
SELECT MIN(SectionNo)
FROM Section_T
WHERE Semester = 'I-2008';

7. Write SQL queries to answer the following questions:

a) How many students are enrolled in Section 2714 in the first semester of 2008?

A:
SELECT StudentID
FROM Registration_T
WHERE SectionNo = 2714 AND Semester = 'I-2008';

b) Which faculty members have qualified to teach a course since 1993? List the faculty ID, course, and date of qualification.

A:
SELECT FacultyID, CourseID, Date
FROM Date_T
WHERE Date > '31-DEC-1992';

8. Write SQL queries to answer the following questions:

a) Which students are enrolled in Database and Networking? (Hint: Use SectionNo for each class so you can determine the answer from the Registration table by itself.)

A:

```
SELECT StudentID  
FROM Registration_T  
WHERE SectionNo = 2714 OR SectionNo = 2715;
```

b) Which instructors cannot teach both Syst Analysis and Syst Design?

A:

```
SELECT FacultyID  
FROM Date_T  
WHERE CourseID != 'ISM 3113' AND CourseID != 'ISM 3113';
```