Readings:

Multiple Table Processing: JOINS

chapter 7: “Advanced SQL” (Hoffer, Ramesh, & Topi) page 289- 298

chapter 6: “Queries: JOIN Operator” (Petkovic) from page 240 -255

Multiple Table Processing: Subquery

chapter 6: “Queries: Correlated Subqueries” (Petkovic) from page 255 to the end of the chapter

chapter 7: “Advanced SQL” (Hoffer, Ramesh, & Topi) from page 289 -310

Homework assignment:

- Homework part A
  Chapter 7 (Hoffer, Ramesh, & Topi)
  Problems and Exercises 1,2,3,4,5

1. **Write SQL retrieval commands for each of the following queries:**
   a. **Display the course ID and course name for all courses with an ISM prefix.**

```
SELECT CourseID, CourseName

FROM COURSE

WHERE CourseID LIKE `ISM%`;
```

   b. **Display all courses for which Professor Berndt has been qualified.**

```
SELECT COURSE.CourseID, COURSE.CourseName

FROM COURSE, QUALIFIED, FACULTY

WHERE COURSE.CourseID = QUALIFIED.CourseID

AND FACULTY.FacultyID = QUALIFIED.FacultyID

AND FACULTY.FacultyName = ` Berndt `;
```

   c. **Display the class roster, including student name, for all students enrolled in section 2714 of ISM 4212.**

```
SELECT STUDENT.StudentName

FROM STUDENT

WHERE STUDENT.StudentID in

(select StudentID

where REGISTRATION.SectionNO = 2714

AND REGISTRATION.CourseID = `ISM 4212`);
```

2. **Write an SQL query to answer the following question: Which instructors are qualified to teach ISM 3113?**

```
SELECT FACULTY.FacultyID, FACULTY.FacultyName

FROM FACULTY, QUALIFIED

Where FACULTY. FacultyID = QUALIFIED.FacultyID

AND QUALIFIED.CourseID = ` ISM 3113`;
```

3. **Write an SQL query to answer the following question: Is any instructor qualified to teach ISM 3113 and not qualified to teach ISM 4930?**

```
SELECT FACULTY.FacultyID, FACULTY.FacultyName

FROM FACULTY, QUALIFIED

Where FACULTY. FacultyID IN

(SELECT FacultyID

FROM QUALIFIED

WHERE QUALIFIED.CourseID = ` ISM 3113`)

AND FACULTY. FacultyID NOT IN

(SELECT FacultyID

FROM QUALIFIED

WHERE QUALIFIED.CourseID = ` ISM 4930`);
```

4. **Write SQL queries to answer the following questions:**
   a. How many students were enrolled in section 2714 during semester I-2008?

```
SELECT StudentID, Count(*)
FROM REGISTRATION
WHERE SectionNo = 2714
AND Semester = `I-2008`;
```

   b. How many students were enrolled in ISM 3113 during semester I-2008?

```
SELECT StudentID, Count(*)
FROM REGISTRATION
WHERE SectionNo IN
(SELECT SectionNo
FROM SECTION
WHERE CourseID = `ISM 3113`)
AND Semester = `I-2008`;
```

5. **Write an SQL query to answer the following question:**
   Which students were not enrolled in any courses during semester I-2008?

```
SELECT StudentID, StudentName
```

```
FROM STUDENT
WHERE StudentID NOT IN
(SELECT StudentID
FROM REGISTRATION
WHERE Semester = `I-2008`);
```

- **Homework part B**

Use the "sample_DDL_script.sql" file from the blackboard to create a sample database named "sample". Use a second script file named "sample_insert_script.sql" to populate the database with sample data. Both files can be downloaded from the class blackboard.

Using the database created, answer write the SQL statements for the following questions:

1. **Return a list with dept_no and a count of employees in each department.**

```
SELECT [emp_no],[emp_fname],[emp_lname],[dept_no]
FROM [dbo].[employee]
WHERE [dept_no] IN
(SELECT DISTINCT [dept_no]
FROM [dbo].[department])
ORDER BY [dept_no];
```

	emp_no	emp_fname	emp_lname	dept_no
1	15000	John	Smith	D1
2	28559	Matthew	Hoyer	D1
3	25348	Luke	Smith	D2
4	15001	Mark	Kelter	D2
5	15007	Deshaun	Jackson	D2
6	15003	Ba	Tran	D2
7	15004	Rohit	Joshi	D3
8	15008	Lionell	Messi	D3
9	15002	Peter	McDonalds	D3
10	15005	Lei	Zhou	D4
11	29346	Jay	Moser	D4
12	15006	Juan	Garcia	D5

2. **Return a list with dept_no and a count of employees in each department. Only show departments with greater than or equal to 2 employees**

```
SELECT [emp_no],[emp_fname],[emp_lname],[dept_no]
FROM [dbo].[employee]
WHERE [dept_no] IN
(SELECT DISTINCT [dept_no]
FROM [dbo].[employee]
GROUP BY [dept_no]
HAVING COUNT([dept_no]) >= 2)
ORDER BY [dept_no];
```

	emp_no	emp_fname	emp_lname	dept_no
1	15000	John	Smith	D1
2	28559	Matthew	Hoyer	D1
3	15007	Deshaun	Jackson	D2
4	15001	Mark	Kelter	D2
5	15003	Ba	Tran	D2
6	25348	Luke	Smith	D2
7	15004	Rohit	Joshi	D3
8	15002	Peter	McDonalds	D3
9	15008	Lionell	Messi	D3
10	29346	Jay	Moser	D4
11	15005	Lei	Zhou	D4

3. Find the highest employee number.

```
SELECT [emp_no],[emp_fname],[emp_lname],[dept_no]
FROM
(select MAX([emp_no]) MaxEmpNo from [dbo].[employee]),
[dbo].[employee]
where [emp_no] = MaxEmpNo;
```

	emp_no	emp_fname	emp_lname	dept_no
1	29346	Jay	Moser	D4

4. What is the difference between COUNT(*) and COUNT(column)? Write a SQL Example

COUNT(*) returns the total number of records, while COUNT(column) returns the total number of Non-NULL records.

```
CREATE TABLE [dbo].[person](
    [person_no] [char](4) NOT NULL,
    [person_name] [varchar](25),
 CONSTRAINT [prim_person] PRIMARY KEY CLUSTERED
([person_no] ASC
)
) ON [PRIMARY]
GO

insert into [dbo].[person] values(1, 'lily'), (2, 'lucy'), (3, 'max'), (4, null);
select count(*) from [dbo].[person];
select count([person_name]) from [dbo].[person];
```

110 %

Results | Messages

	(No column name)
1	4

	(No column name)
1	3

5. Get the project_no that are done by more than 1 employee.

```
select project_no
from [dbo].[works_on]
group by [project_no]
```

```
having count([emp_no]) > 1;
```

	project_no
1	p1
2	p2