SQL Query Examples

Attribute Projection Using One Table

Get the course numbers of all courses in which students are enrolled

    SELECT CourseNum
    FROM ENROLL

Get all information about all students

    SELECT *
    FROM STUDENT

Tuple Selection Involving One Table

Get the names, IDs and number of credits of all math majors

    SELECT STUNam, STUID, Credits
    FROM STUDENT
    WHERE Major = 'Math'

Get all information about CSC faculty

    SELECT *
    FROM FACULTY
    WHERE Dept = 'CSC'

Get the names and IDs of all faculty members, arranged in alphabetical order by name

    SELECT FacName, FACID
    FROM FACULTY
    ORDER BY FacName

Get the names of all math majors who have more than 30 credits earned

    SELECT StuName
    FROM STUDENT
    WHERE Major = 'Math' and Credits > 30
Functions and calculations in the attribute list

Find the total number of students enrolled in ART103A

```
SELECT Count(DISTINCT STUID)
FROM ENROLL
WHERE CourseNum = 'ART103A'
```

Find the number of departments that have faculty in them.

```
SELECT count(DEPT)
FROM FACULTY
```

Find the average number of credits students have.

```
SELECT avg(Credits)
FROM STUDENT
```

Operators and Expressions in the Where Clauses

Get the details of all MTH courses

```
SELECT *
FROM CLASS
WHERE CourseNo LIKE 'MTH%'
```

Find the STUID and Course number of all students whose grades in that course are missing.

```
SELECT STUID, CourseNum
FROM ENROLL
WHERE Grade IS NULL
```

Group By and Having

For each course, show the number of students enrolled.

```
SELECT CourseNum, count(*)
FROM ENROLL
GROUP BY CourseNum
```
Find all courses in which fewer than 3 students are enrolled

```sql
SELECT CourseNum
FROM ENROLL
GROUP BY CourseNum
HAVING count(*) < 3
```

Find the IDs and names of all students taking ART103A

```sql
SELECT STUDENT.STUID, StuName
FROM STUDENT, ENROLL
WHERE CourseNum = 'ART103A' AND
      STUDENT.STUID = ENROLL.STUID
```

Multiple Table Queries Based on Cartesian Product

Find the STUID and grade of all students taking any course taught by the faculty member whose FACID is F110. Arrange in order by STUID.

```sql
SELECT STUID, Grade
FROM CLASS, ENROLL
WHERE FacID = 'F110' AND
      CourseNo = CourseNum
ORDER BY STUID
```

Find the course numbers and the names and majors of all students enrolled in the courses taught by faculty member F110.

```sql
SELECT ENROLL.CourseNum, StuName
FROM CLASS, ENROLL, STUDENT
WHERE FacID = 'F110' AND
      CourseNum = CourseNo AND
      STUDENT.STUID = ENROLL.STUID
```

Get a list of all courses that meet in the same room, with their schedules and room numbers.

```sql
SELECT C1.CourseNum, C1.Sched, C1.Room
FROM CLASS C1, CLASS C2
WHERE FacID = 'F110' AND
      C1.Room = C2.Room AND
      C1.CourseNo < C2.CourseNo
```
Multiple Table Queries Using Nested Selects

Find the numbers of all the courses taught by Byrne

```sql
SELECT CourseNo
FROM CLASS
WHERE FacID =
(  
  SELECT FacID
  FROM FACULTY
  WHERE FacName = 'Byrne' AND Dept = 'Math'
)
```

Find the names and IDs of all faculty members who teach a class in room H221

```sql
SELECT FacID, FacName
FROM FACULTY
WHERE FacID IN
(  
  SELECT FACID
  FROM CLASS
  WHERE Room = 'H221'
)
```

Find the student with the largest number of credits.

```sql
SELECT , STUID, StuName
FROM STUDENT
WHERE Credits =
(  
  SELECT Max(Credits)
  FROM STUDENT
)
```

Find the student with the highest grade in any course.

```sql
SELECT , STUID
FROM ENROLL
WHERE Grade =
(  
```
SELECT Min(Grade)
FROM ENROLL
)

Find the names and IDs of students who have less than the average number of credits.
SELECT STUID, STUName
FROM STUDENT
WHERE CREDITS =
  (SELECT MAX(credits)
   FROM STUDENT)
)

Get an alphabetical listing of the names and IDs of all students in any class taught by F110.
SELECT STUID, STUName
FROM STUDENT
WHERE STUID IN
  (SELECT STUID
   FROM ENROLL
   WHERE COURSENO IN
     (SELECT COURSEID
      FROM CLASS
      WHERE FACID = 'F110'
     )
  )

**Nested Selects and Exists**

Find the names of all students enrolled in CSC201A

SELECT STUName
FROM STUDENT
WHERE EXISTS
  (SELECT *
   FROM ENROLL
   WHERE STUDENT.STUID = ENROLL.STUID and
   CourseNum = 'CSC201A'
  )
Find the names of all students who are not enrolled in CSC201A

SELECT STUName
FROM STUDENT
WHERE NOT EXISTS
  (SELECT * FROM ENROLL WHERE STUDENT.STUID = ENROLL.STUID and FACID = 'F110')

Set Theoretic Operations in SQL

Get the IDs of all faculty who are assigned to the History department at either the main campus or the branch campus. Assume that the table BRANCHFAC contains data about faculty at the branch campus.

SELECT FACID
FROM FACULTY
WHERE Dept = 'History'
UNION
SELECT FACID
FROM BRANCHFAC
WHERE Dept = 'History'

Use of SELECT in the WHERE clauses of Tuple Modifications in Tables

Change the grade to ‘I’ for all students in courses taught by faculty member F110

UPDATE ENROLL
SET Grade = 'I'
WHERE CourseNo IN
  (SELECT CourseNo FROM CLASS WHERE FACId = 'F110')
Change the room to B220 for all courses taught by Tanaka.

```sql
UPDATE CLASS
SET Room = 'B220'
WHERE FACID =
(
    SELECT FACID
    FROM FACULTY
    WHERE FACName = 'Tanaka'
)
```

Create and fill a new table that shows each course and the number of students in it.

```sql
CREATE TABLE ENROLLMENT
    (COURSENum CHAR(7) NOT NULL Primary key,
    STUDENTS smallint);

INSERT INTO ENROLLMENT(CourseNum,STUDENTS)
    SELECT CourseNum, Count(*)
    FROM ENROLL
    GROUP BY CourseNum
```

Erase all enrollment records for Owen McCarthy.

```sql
DELETE FROM ENROLL
WHERE STUID =
(SELECT STUID FROM STUDENT WHERE STUNAME = 'Owen McCarthy')
```