

1 查询姓名中含有“科”字的学生学号和姓名

```
SELECT sno,
       sname
FROM Student
WHERE sname LIKE '%科%';
```

2 查询学分不低于 3 分的必修课课程号和课程名

```
SELECT cno,
       cname
FROM Course
WHERE credit >= 3;
```

3 查询选修了公选课但是缺少成绩的学生学号和姓名

```
SELECT Student.sno,
       Student.sname
FROM Student,
       Course,
       SC
WHERE Student.sno = SC.sno
      AND Course.cno = SC.cno
      AND Course.type = 3
      AND SC.score IS NULL;
```

4 查询年龄大于 20 的学生学号、姓名和年龄

```
SELECT t1.sno,
       t1.sname,
       age
FROM Student
     NATURAL JOIN (
       SELECT sno,
              sname,
              FLOOR(
                YEAR(now()) - YEAR(birthdate) + 1 / 1000 * (DAYOFYEAR(now()) - DAYOFYEAR(birthdate))
              ) AS age
       FROM Student
     ) AS t1
WHERE age > 20;
```

5 查询已选必修课总学分大于 16 并且所选通识课成绩都大于 75 分的学生姓名

```
SELECT sname
FROM Student
WHERE sno IN (
  SELECT sno
  FROM Course,
       SC
  WHERE type = 0
        AND SC.cno = Course.cno
  GROUP BY sno
  HAVING SUM(credit) > 16
)
AND sno NOT IN(
  SELECT SC.sno
  FROM Course,
       SC
  WHERE type = 2
        AND score <= 75
        AND Course.cno = SC.cno
)
```

```
);
```

6 查询已经修完所有必修课且成绩合格的学生学号和姓名

```
SELECT Student.sno,
       sname
FROM Student
WHERE NOT EXISTS(
    SELECT *
    FROM Course
    WHERE NOT EXISTS(
        SELECT *
        FROM SC
        WHERE SC.sno = Student.sno
              AND SC.cno = Course.cno
    )
    AND type = 0
)
AND student.sno NOT IN(
    SELECT Student.sno
    FROM Student,
         SC,
         course
    WHERE Student.sno = SC.sno
          AND score < 60
          AND type = 0
);
```

7 查询总平均成绩排名在前 50%（向上取整）的学生中必修课平均分最高的前 10 位同学，
要求返回这些学生的学号、姓名、必修课平均分以及课程总平均成绩（不足 10 位时则全部返回）

```
WITH Total(sno, total_score) AS (
    SELECT sno,
           AVG(score)
    FROM Course
    NATURAL JOIN SC
    GROUP BY sno
)
SELECT student.sno,
       sname,
       average_score,
       total_score
FROM Student,
(
    SELECT SC.sno,
           AVG(score) AS average_score
    FROM SC
    NATURAL JOIN Course
    WHERE type = 0
    GROUP BY SC.sno
) AS t1,
Total
WHERE student.sno = t1.sno
AND Total.sno = student.sno
AND (
    SELECT COUNT(*)
    FROM Total AS t2
    WHERE t2.total_score > Total.total_score
) < CEIL(
    (
        SELECT COUNT(*)
    )
);
```

```

        FROM Student
    ) / 2
)
ORDER BY average_score DESC
LIMIT 10;

```

8 查询每门课程的课程名、课程类型、最高成绩、最低成绩、平均成绩和不及格率，要求结果按通识课、必修课、选修课、公选课顺序排列（提示：课程名可能有重名）

```

WITH Total(cno, total_number) AS(
    SELECT cno,
           COUNT(*)
    FROM SC
    GROUP BY cno
),
Fail(cno, fail_number) AS(
    SELECT cno,
           COUNT(*)
    FROM SC
    WHERE score < 60
    GROUP BY cno
)
SELECT cname,
       type,
       max_grade,
       min_grade,
       average_score,
       fail_rate
FROM (
    Course
    natural JOIN (
        SELECT cno,
               MAX(score) AS max_grade,
               MIN(score) AS min_grade,
               AVG(score) AS average_score
        FROM SC
        GROUP BY cno
    ) AS t1
    NATURAL JOIN (
        SELECT cno,
               (fail_number / (cast(total_number AS float))) AS fail_rate
        FROM Total
        NATURAL JOIN Fail
    ) AS t2
)
ORDER BY field(type, 2, 0, 1, 3);

```

9 查询存在课程重修不及格情况的学生学号、姓名以及重修不及格的课程号和课程名
第二次重修的课程不及格

```

SELECT SC.sno,
       sname,
       SC.cno,
       cname
FROM (
    SELECT sno,
           cno
    FROM (
        SELECT sno,
               cno,
               COUNT(term) AS c
        FROM SC
        GROUP BY sno,

```

```

        cno
    ) AS t1
    WHERE c >= 2
) AS t2
natural JOIN (
    SELECT sno,
           cno,
           m_t
    FROM (
        SELECT sno,
               cno,
               MAX(term) AS m_t
        FROM SC
        GROUP BY sno,
               cno
    ) AS t3
) AS t4,
Student,
Course,
SC
WHERE m_t = SC.term
AND Student.sno = SC.sno
AND Course.cno = SC.cno
AND score < 60;

```

修两次的课程（假设第一次不及格才重修）

```

SELECT student.sno,
       sname,
       course.cno,
       cname
FROM (
    SELECT sno,
           cno
    FROM (
        SELECT sno,
               cno,
               COUNT(term) AS c
        FROM SC
        GROUP BY sno,
               cno
    ) AS t6
    WHERE c >= 2
) AS t3,
Student,
Course
WHERE Student.sno = t3.sno
AND Course.cno = t3.cno;

```

10 SC 表中重复的 sno 和 cno 意味着该学生重修了课程（在不同的学期里），现在我们希望删除学生重复选课的信息，只保留最近一个学期的选课记录以及成绩，请给出相应的

SQL 语句

```

DELETE FROM SC AS t1
WHERE t1.term <> (
    SELECT *
    FROM (
        SELECT MAX(t2.term)
        FROM SC AS t2
        WHERE t1.sno = t2.sno
              AND t1.cno = t2.cno
    ) AS alisname
);

```