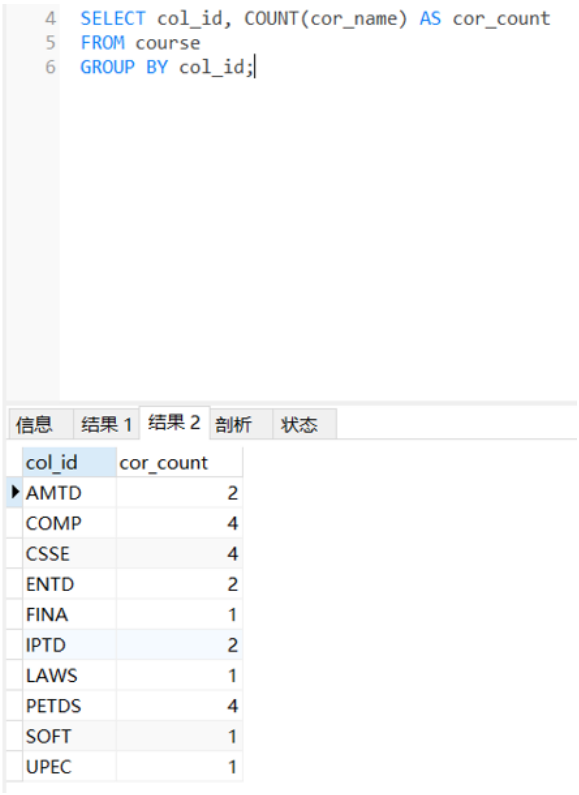
2024 年春季《数据库系统》上机考试题

第一题：查询学生表中所有不同的学院编号（注：过滤学院编号为空的数据）

第二题：查询每个学院开设的课程数量（col_id，cor_count）



第三题：查询学生平均年龄大于 19 的学院编号和平均年龄，按平均年龄降序排序

```
SELECT col_id, AVG(age) AS avg_age
FROM student
GROUP BY col_id
HAVING avg_age > 19
ORDER BY avg_age DESC;
```

信息 | 结果 1 | 结果 2 | 结果 3 | 剖析 | 状态

col_id	avg_age
LAWS	19.6667
CSSE	19.5000
COMP	19.4444

第四题：查询学生姓名含'王安'或者学号为空的学生的学号和姓名

```
SELECT stu_id, stu_name
FROM student
WHERE stu_name LIKE '王安%'OR idcard is null;
```

信息 | 结果 1 | 结果 2 | 结果 3 | 结果 4 | 结果 5 | 剖析 | 状态

stu_id	stu_name
0110514	王安
0111123	王安默
0111871	魏前程
0210535	王安
0211258	艾之章
0211666	王安

第五题：查询计算机学院开设课程的课程名和平均期末成绩，按平均期末成绩降序排序

```sql
SELECT course.cor_name, AVG(takes.fin_score) as avg_fin_score
FROM course
JOIN takes ON course.cor_id = takes.cor_id
JOIN college ON course.col_id = college.col_id
WHERE college.col_name = '计算机学院'
GROUP BY course.cor_name
ORDER BY avg_fin_score DESC;
```

信息 | 结果 1 | 结果 2 | 结果 3 | 结果 4 | 结果 5 | 剖析 | 状态

cor_name	avg_fin_score
操作系统	94.00000
算法导论	93.00000
数据库系统	92.08333
计算机网络	90.66667

第六题：查询上课时间有冲突的课程对，同一对课程只输出一次

```sql
SELECT C1.cor_name, C2.cor_name
FROM course C1, course C2
WHERE C1.cor_id < C2.cor_id
AND C1.day = C2.day
AND ((C1.start_time BETWEEN C2.start_time AND C2.end_time) OR (C1.end_time BETWEEN C2.start_time AND C2.end_time));
```

信息 | 结果 1 | 剖析 | 状态

cor_name	cor_name(1)
计算机网络	高等数学B
基础英语	高等数学A
算法导论	足球
算法设计	篮球
法律方法	软件测试

第七题：查询课程平均成绩前三的课程的课号和名称，课程成绩=0.3 平时成绩+0.7 期末成绩（不考虑均分相同，只输出 3 个）

```sql
SELECT course.cor_id, course.cor_name
FROM course
JOIN (
    SELECT takes.cor_id, AVG(0.3 * takes.mid_score + 0.7 * takes.fin_score) as avg_score
    FROM takes
    GROUP BY takes.cor_id
) AS score ON course.cor_id = score.cor_id
ORDER BY score.avg_score DESC
LIMIT 3;
```

信息 | 结果 1 | 剖析 | 状态

cor_id	cor_name
0513	健康教育
1012	数据库系统
1016	算法设计

第八题：查询没有选课的学生的姓名和他们所在的学院的名称

```sql
SELECT student.stu_name, college.col_name
FROM student
LEFT JOIN college ON student.col_id = college.col_id
WHERE NOT EXISTS (
  SELECT * FROM takes WHERE student.stu_id = takes.stu_id
);
```

信息 | 结果 1 | 剖析 | 状态

stu_name	col_name
魏前程	(Null)
张睐	计算机学院

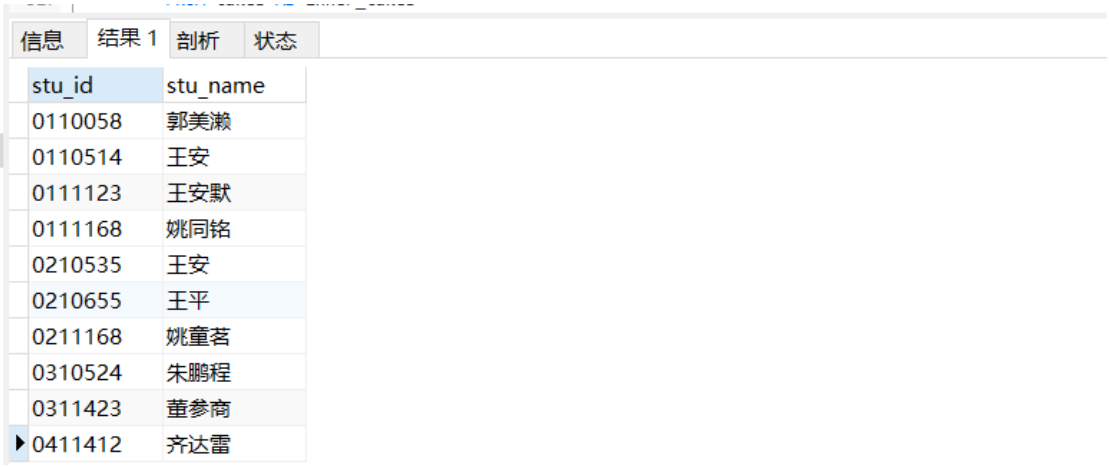
第九题：查询满足以下条件的学生的学号和姓名:

1.学生所选的课程中，至少有一门课程的成绩高于该课程的平均成绩;

2.*学生的平均成绩*高于学生所在*学院中所有学生的平均成绩*，学生的平均成绩=该学生所有课程成绩的均值，学院中所有学生的平均成绩=该学院所有学生的平均成绩的均值。

（成绩=0.3 平时成绩+0.7 期末成绩）

```sql
SELECT S1.stu_id, S1.stu_name
FROM student AS S1
WHERE EXISTS (
    SELECT 1
    FROM takes AS T1
    WHERE S1.stu_id = T1.stu_id AND (0.3 * T1.mid_score + 0.7 * T1.fin_score) > (
        SELECT AVG(0.3 * inner_takes.mid_score + 0.7 * inner_takes.fin_score)
        FROM takes AS inner_takes
        WHERE inner_takes.cor_id = T1.cor_id
    )
)
AND (
  S1.stu_id in (
    SELECT stu_id
    FROM (
      (SELECT student.stu_id, student.col_id, AVG(0.3 * takes.mid_score + 0.7 * takes.fin_score) as avg_score
      FROM takes
      JOIN student ON takes.stu_id = student.stu_id
      GROUP BY student.stu_id
      ) AS Q1
      JOIN
      (
          SELECT student.col_id, AVG(0.3 * takes.mid_score + 0.7 * takes.fin_score) as avg_score_col
          FROM takes
          JOIN student ON takes.stu_id = student.stu_id
          GROUP BY student.col_id
      ) AS Q2
      ON Q1.col_id =  Q2.col_id
    )
    WHERE Q1.avg_score > Q2.avg_score_col
  )
)
;
```



信息 结果 1 剖析 状态

stu_id	stu_name
0110058	郭美濑
0110514	王安
0111123	王安默
0111168	姚同铭
0210535	王安
0210655	王平
0211168	姚童茗
0310524	朱鹏程
0311423	董参商
0411412	齐达雷

第十题：查询满足以下条件的学生姓名和课程名:

1.学生姓名为同名;

2.这些同名同学同时选的课程。

例如，有三个都叫张三的同学，他们的选课记录为:

“

张三 算法设计 足球

张三 操作系统 算法设计 足球

张三 算法设计

”

则输出:

“张三 算法设计”

```sql
select stu_name, cor_name from
(
  SELECT T1.stu_name, T1.cor_name, COUNT( * ) AS countcor
  FROM (
    SELECT S1.stu_id, S1.stu_name, C.cor_name
    FROM student S1
    JOIN takes T1 ON S1.stu_id = T1.stu_id
    JOIN course C ON T1.cor_id = C.cor_id
    WHERE
      EXISTS ( SELECT 1 FROM student S2 WHERE S1.stu_name = S2.stu_name AND S1.stu_id != S2.stu_id )
    ) AS T1
  GROUP BY T1.cor_name, T1.stu_name
) as T3
where (stu_name,countcor)
in
(
SELECT stu_name, max(countcor) AS countcor  from
  (
  SELECT T1.stu_name, T1.cor_name, COUNT( * ) AS countcor
  FROM (
    SELECT S1.stu_id, S1.stu_name, C.cor_name
    FROM student S1
    JOIN takes T1 ON S1.stu_id = T1.stu_id
    JOIN course C ON T1.cor_id = C.cor_id
    WHERE
      EXISTS ( SELECT 1 FROM student S2 WHERE S1.stu_name = S2.stu_name AND S1.stu_id != S2.stu_id )
    ) AS T1
  GROUP BY T1.cor_name, T1.stu_name
  ) as T2
  GROUP BY stu_name
);
```

信息 | 结果 1 | 剖析 | 状态

stu_name	cor_name
王安	基础英语
王安	马原
王安	高等数学A
王安	健康教育