【Experiment name】 Database Experiment 2 - Data Query

【Experimental content】

Task one:

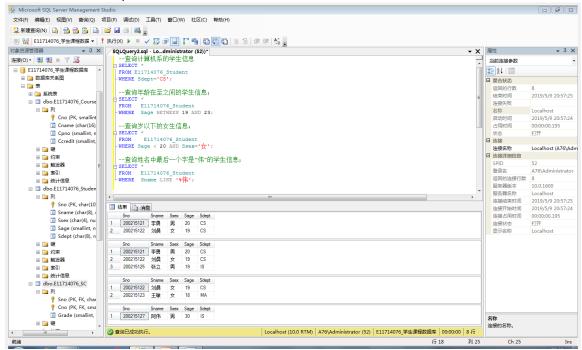Perform various simple queries against the student course database.

1. Query the student information of the Department of Computer Science;
2. Query the information of students between the ages of 19 and 23;
3. Query the information of girls under the age of 20;
4. Query the information of students whose last name is "Wei";
5. Query the student information whose student ID starts with "E";
6. Query the course information with 2 credits
7. Query the course information with "computer" in the course name;
8. Query the information of "database", "operating system" and "computer network courses";
9. Query the elective status of No. 2 course;
10. Inquire about a student's course selection (the student ID number is self-determined);
11. Query the course selection situation with a score of 90 or more
12. Query the two highest scores in the course selection;
13 Calculate the highest score, lowest score, and average score of course No. 1;
14. Query the number and average score of a student's courses;
15. Calculate the highest score, lowest score and average score of each course in groups;
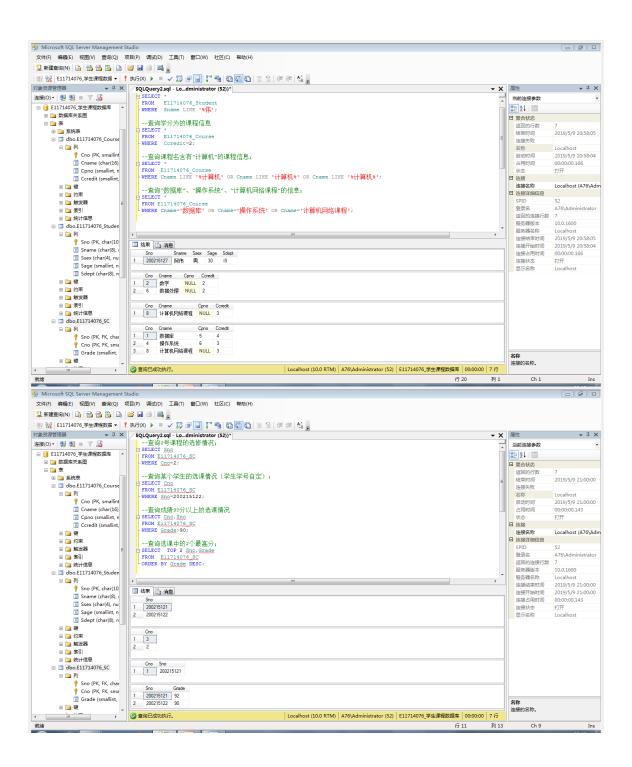16. Calculate the highest score, lowest score and average score of each student in groups;

```sql
--Query the student information of the Department of Computer Science
SELECT *
FROM A101_Student
WHERE Sdept = 'CS' ;

--Query the information of students whose age is between 1 and 2;
SELECT *
FROM  A101_Student
WHERE  Sage BETWEEN 19 AND 23 ;

--Query the information of girls under the age of 10;
SELECT *
FROM  A101_Student
WHERE Sage < 20 AND Ssex = 'Female' ;
```
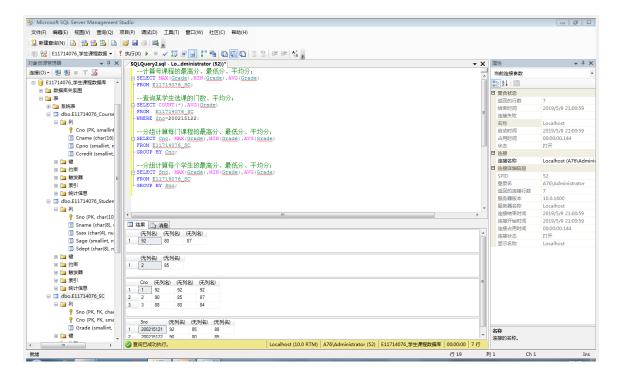
```sql
--Query the information of students whose last name is "Wei";
SELECT *
FROM   A101_Student _
WHERE  Sname like '%wei' ;

--Query student information whose student ID starts with "E";
SELECT *
FROM   A101_Student _
WHERE  sn o like ' E %' ;

--Query course information for credits
SELECT *
FROM   A101 _Course
WHERE  Ccredit = 2 ;

--Query the course information containing "computer" in the course name;
SELECT *
FROM  A101 _Course
WHERE Cname like '%computer' OR Cname like 'computer%' OR Cname like
'%computer%' ;

--Query the information of "database", "operating system" and "computer
network courses";
SELECT *
FROM A101 _Course
WHERE Cname = 'database' OR Cname = 'operating system' OR Cname = 'Computer
Network Course' ;

--Query the elective status of No. 2 course;
SELECT Snow
FROM A101_SC _
WHERE Cno = 2 ;

--Query the course selection of a student (student number is
self-determined);
SELECT Cno
FROM A101_SC _
WHERE Sno = 200215122 ;

--Query the course selection situation with a score of 90 or more
SELECT Cno , Sno
FROM A101_SC _
WHERE Grade > 90 ;

--Query the 2 highest scores in the course selection;
SELECT  TOP 2 Sno , Grade
FROM   A101_SC _
ORDER BY Grade DESC ;

-- Calculate the highest score, lowest score, and average score of the number
course;
SELECT MAX ( Grade ), MIN ( Grade ), AVG ( Grade )
FROM A101_SC ; _

--Query the number and average score of a student's course selection;
SELECT COUNT (*), AVG ( Grade )
FROM  A101_SC _
```

```sql
WHERE Sno = 200215122 ;

-- Calculate the highest score, the lowest score, and the average score of
each course in groups;
SELECT Cno , MAX ( Grade ), MIN ( Grade ), AVG ( Grade )
FROM A101_SC
GROUP BY Cno ;

-- Calculate the highest score, lowest score, and average score of each
student in groups;
SELECT Sno , MAX ( Grade ), MIN ( Grade ), AVG ( Grade )
FROM A101_SC
GROUP BY Sno ;
```

Screenshot of the experiment:

Screenshot 1 — Microsoft SQL Server Management Studio

```sql
SELECT *
FROM  E11714076_Student
WHERE Sname LIKE '%伟';

--查询学分为的课程信息
SELECT *
FROM  E11714076_Course
WHERE Ccredit=2;

--查询课程名含有"计算机"的课程信息
SELECT *
FROM  E11714076_Course
WHERE Cname LIKE '%计算机' OR Cname LIKE '计算机%' OR Cname LIKE '%计算机%';

--查询"数据库"、"操作系统"、"计算机网络课程"的信息;
SELECT *
FROM E11714076_Course
WHERE Cname='数据库' OR Cname='操作系统' OR Cname='计算机网络课程';
```

Screenshot 2

```sql
--查询2号课程的选修情况;
SELECT Sno
FROM  E11714076_SC
WHERE Cno=2;

--查询某个学生的选课情况（学生学号自定）;
SELECT Cno
FROM  E11714076_SC
WHERE Sno=200215122;

--查询成绩90分以上的选课情况
SELECT Cno,Sno
FROM  E11714076_SC
WHERE Grade>90;

--查询选课中的2个最高分;
SELECT  TOP 2 Sno,Grade
FROM  E11714076_SC
ORDER BY Grade DESC;
```

Task two:

1. For Exercise 5 in Chapter 2, build the SPJ database and perform various simple queries.
2. Query S1 supplier information;
3. Query supplier information in Beijing;
4. Query the part information whose color is red;
5. Query the project information containing "factory" in the name;
6. Query the information of parts whose weight is less than 30;
7. Inquire about engineering project information in Beijing;
8. Query the supplier information of the "J1" parts of the supply project;
9. Query the information of suppliers supplying project "J1" part "P2";
10 Inquire about the availability of P2 parts;
11. Query the supply details with a supply quantity of 100;
12. Query the details of the supply whose supply is between 200 and 400;
13. Query the supply situation of the two largest supplies;
14. Calculate the highest, lowest and average supply of S1 suppliers;
15. Query the supply times and maximum supply of J1 items;
16. Calculate the highest, lowest and average supply of each supplier in groups;
17. Calculate the highest, lowest and average supply of each item in groups;

```sql
--Query S1 supplier information;
SELECT *
FROM A101_S
WHERE SNO = 'S1' ;

--Query supplier information in Beijing;
```

```sql
SELECT *
FROM A101_S
WHERE CITY = 'Beijing' ;

--Query the part information whose color is red;
SELECT *
FROM A101_P
WHERE COLOR = 'red' ;

--Query the project information containing "factory" in the name;
SELECT *
FROM A101_J
WHERE JNAME LIKE '%factory' ;

--Query the information of parts whose weight is less than;
SELECT *
FROM A101_P
WHERE WEIGHT < 30 ;

--Query the engineering project information in Beijing;
SELECT *
FROM A101_J
WHERE CITY = 'Beijing' ;

--Query the supplier information of the "J1" parts of the supply project;
SELECT SNO
FROM A101_SPJ
WHERE JNO = 'J1' ;

--Query the information of suppliers supplying project "J1" part "P2";
SELECT SNO
FROM A101_SPJ
WHERE JNO = 'J1' AND PNO = 'P2' ;

-- Query the availability of P2 parts;
SELECT QTY
FROM A101_SPJ
WHERE P NO = 'P2' ;

--Query the supply details of the supply quantity;
SELECT *
FROM A101_SPJ
WHERE QTY = 100 ;

--Query the supply details of the supply volume between and;
SELECT *
FROM A101_SPJ
WHERE QTY > 200 AND QTY < 400 ;

--Query the supply situation of the two largest supplies;
SELECT TOP 2 *
FROM A101_SPJ
ORDER BY QTY DESC ;

--Calculate the highest, lowest and average supply of S1 suppliers;
SELECT MAX ( QTY ), MIN ( QTY ), AVG ( QTY )
FROM A101_SPJ
```

```sql
WHERE SNO = 'S1' ;

--Query the supply times and maximum supply of J1 items;
SELECT COUNT ( JNO ), MAX ( QTY )
FROM A101_SPJ
WHERE JNO = 'J1' ;

-- Calculate the highest, lowest and average supply of each supplier by group;
SELECT SNO , MAX ( QTY ), MIN ( QTY ), AVG ( QTY )
FROM A101_SPJ
GROUP BY SNO ;

-- Calculate the highest, lowest, and average supply of each item in groups;
SELECT JNO , MAX ( QTY ), MIN ( QTY ), AVG ( QTY )
FROM A101_SPJ
GROUP BY JNO ;
```

文件(F) 编辑(E) 视图(V) 查询(Q) 项目(P) 调试(D) 工具(T) 窗口(W) 社区(C) 帮助(H)

SQLQuery3.sql - Lo...ministrator (53))*   SQLQuery2.sql - Lo...dministrator (52))*

```sql
--查询名称中含有"厂"的工程项目信息;
SELECT *
FROM E11714076_J
WHERE JNAME LIKE'%厂';

--查询重量小于的零件信息;
SELECT *
FROM E11714076_P
WHERE WEIGHT <30;

--查询北京的工程项目信息;
SELECT *
FROM E11714076_J
WHERE CITY ='北京';
```

	JNO	JNAME	CITY
1	J3	弹簧厂	天津
2	J4	造船厂	天津
3	J5	机车厂	唐山
4	J6	无线电厂	常州
5	J7	半导体厂	南京

	PNO	PNAME	COLOR	WEIGHT
1	P1	螺母	红	12
2	P2	螺栓	绿	17
3	P3	螺丝刀	蓝	14
4	P4	螺丝刀	红	14

	JNO	JNAME	CITY
1	J1	三建	北京

查询已成功执行.   Localhost (10.0 RTM) A76\Administrator (53) E11714076_SPJ数据库 00:00:00 10 行

文件(F) 编辑(E) 视图(V) 查询(Q) 项目(P) 调试(D) 工具(T) 窗口(W) 社区(C) 帮助(H)

SQLQuery4.sql - Lo...ministrator (52))*

```sql
--查询供应工程"J1"零件的供应商信息;
SELECT SNO
FROM E11714076_SPJ
WHERE JNO='J1';

--查询供应工程"J1"零件"P2"的供应商的信息;
SELECT SNO
FROM E11714076_SPJ
WHERE JNO='J1' AND PNO='P2';

--查询P2零件的供应情况;
SELECT QTY
FROM E11714076_SPJ
WHERE PNO='P2';
```

	SNO
1	S4
2	S1
3	S3
4	S3
5	S5
6	S2
7	S2

	SNO

	QTY
1	100
2	100

查询已成功执行.   Localhost (10.0 RTM) A76\Administrator (52) E11714076_SPJ数据库 00:00:00 9 行

SQLQuery4.sql - Lo...ministrator (52))*

```sql
--查询供应量为的供应详情;
SELECT *
FROM E11714076_SPJ
WHERE QTY=100;

--查询供应量在和之间的供应详情;
SELECT *
FROM E11714076_SPJ
WHERE QTY>200 AND QTY<400;

--查询两个供应量最大的供应情况;
SELECT TOP 2 *
FROM E11714076_SPJ
ORDER BY QTY DESC;
```

结果 | 消息

	SNO	PNO	JNO	QTY
1	S1	P1	J3	100
2	S1	P2	J2	100
3	S2	P5	J2	100
4	S4	P5	J1	100
5	S5	P2	J4	100

	SNO	PNO	JNO	QTY
1	S4	P6	J3	300

	SNO	PNO	JNO	QTY
1	S1	P1	J4	700
2	S5	P6	J4	500

查询已成功执行。   Localhost (10.0 RTM) | A76\Administrator (52) | E11714076_SPJ数据库 | 00:00:00 | 8 行

SQLQuery4.sql - Lo...ministrator (52))*

```sql
--计算S1 供应商的最高、最低、平均供应量;
SELECT MAX(QTY),MIN(QTY),AVG(QTY)
FROM E11714076_SPJ
WHERE SNO='S1';

--查询J1项目的供应次数，最大供应量;
SELECT COUNT(JNO),MAX(QTY)
FROM E11714076_SPJ
WHERE JNO='J1';
```

结果 | 消息

	(无列名)	(无列名)	(无列名)
1	700	100	275

	(无列名)	(无列名)
1	7	400

查询已成功执行。   Localhost (10.0 RTM) | A76\Administrator (52) | E11714076_SPJ数据库 | 00:00:00 | 2 行

summary:

In this lesson, we have studied single-table query in depth , and further studied through different examples and exercises 1. Select several columns in the table 2. Select several tuples in the table 3. ORDER BY clause 4. Aggregate function 5 , GROUP BY clause and other query methods.

The large number of experiments shown in the above screenshots made me train many times, which deepened the influence on the method of single-table query, gained a lot, and laid a solid foundation for future experimental courses.