

【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;

```
--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' ;
```

```

--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 sno 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 Sno
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 _

```

```
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:

The screenshot shows the Microsoft SQL Server Management Studio interface. The central query window displays the following SQL code:

```
--查询计算机系的学生信息;  
SELECT *  
FROM E11714076_Student  
--WHERE Sdept='CS';  
  
--查询年龄在至之间的学生信息;  
SELECT *  
FROM E11714076_Student  
--WHERE Sage BETWEEN 19 AND 23;  
  
--查询岁以下的女生信息;  
SELECT *  
FROM E11714076_Student  
--WHERE Sage < 20 AND Ssex='女';  
  
--查询姓名中最后一个字是"伟"的学生信息;  
SELECT *  
FROM E11714076_Student  
--WHERE Sname LIKE '*伟';
```

The results grid shows the following data:

Sno	Sname	Ssex	Sage	Sdept	
1	200215121	李勇	男	20	CS
2	200215122	刘晨	女	19	CS

The status bar at the bottom indicates: Localhost (10.0 RTM) | A76\Administrator (52) | E11714076_学生课程数据库 | 00:00:00 | 8 行

Microsoft SQL Server Management Studio

SQLQuery2.sql - Lo...nistrator (52)

```
--查询学分为的课程信息
SELECT *
FROM E11714076_Student
WHERE Sname LIKE '%伟';

--查询课程名为“计算机”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';
```

结果

Sno	Sname	Ssex	Sage	Sdept	
1	200215127	阿伟	男	30	IS

Cno	Cname	Cpno	Ccredit	
1	2	数学	NULL	2
2	6	数据处理	NULL	2

Cno	Cname	Cpno	Ccredit	
1	8	计算机网络课程	NULL	3

Cno	Cname	Cpno	Ccredit	
1	1	数据库	5	4
2	4	操作系统	6	3
3	8	计算机网络课程	NULL	3

属性

当前连接参数

聚合状态

返回的行数 7

结束时间 2019/5/9 20:58:05

连接失败

名称 Localhost

启动时间 2019/5/9 20:58:04

占用时间 00:00:00.166

状态 打开

连接名称 Localhost (A76Adm

连接详细信息

SPID 52

登录名 A76\Administrator

返回的连接行数 7

服务器版本 10.0.1600

服务器名称 Localhost

连接结束时间 2019/5/9 20:58:05

连接开始时间 2019/5/9 20:58:04

连接占用时间 00:00:00.166

连接状态 打开

显示名称 Localhost

名称

连接名称。

Microsoft SQL Server Management Studio

SQLQuery2.sql - Lo...nistrator (52)

```
--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;
```

结果

Sno	
1	200215121
2	200215122

Cno	
1	3
2	2

Cno	Sno	
1	1	200215121

Sno	Grade	
1	200215121	92
2	200215122	90

属性

当前连接参数

聚合状态

返回的行数 7

结束时间 2019/5/9 21:00:00

连接失败

名称 Localhost

启动时间 2019/5/9 21:00:00

占用时间 00:00:00.143

状态 打开

连接名称 Localhost (A76Adm

连接详细信息

SPID 52

登录名 A76\Administrator

返回的连接行数 7

服务器版本 10.0.1600

服务器名称 Localhost

连接结束时间 2019/5/9 21:00:00

连接开始时间 2019/5/9 21:00:00

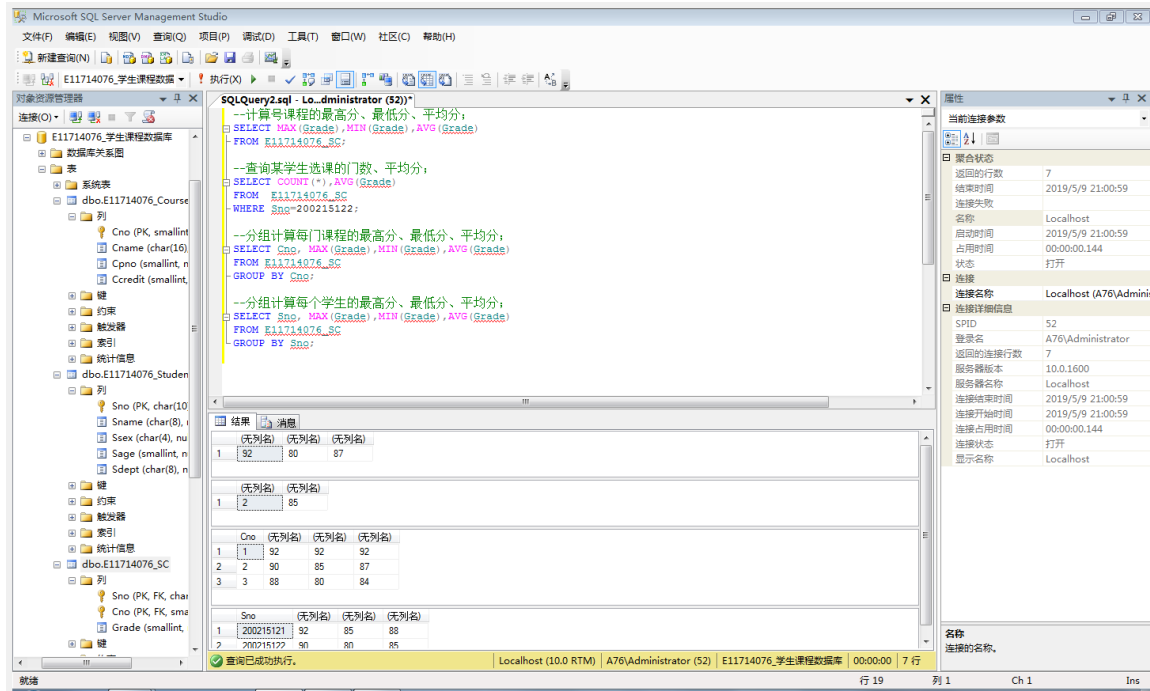
连接占用时间 00:00:00.143

连接状态 打开

显示名称 Localhost

名称

连接名称。



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;

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

```
--Query supplier information in Beijing;
```

```

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 _

```

```
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 ;
```

The screenshot shows the Microsoft SQL Server Management Studio interface. The central pane displays three SQL queries and their results. The left pane shows the server's file explorer, and the right pane shows the properties of the selected connection.

Query 1: Supplier Information

```
--查询S1供应商信息;  
SELECT *  
FROM E11714076_S  
WHERE SNO='S1';
```

SNO	SNAME	STATUS	CITY
S1	精益	20	天津

Query 2: Supplier Information by City

```
--查询北京的供应商信息;  
SELECT *  
FROM E11714076_S  
WHERE CITY='北京';
```

SNO	SNAME	STATUS	CITY
S2	盛棉	10	北京
S3	东方红	30	北京

Query 3: Part Information by Color

```
--查询颜色为红色的零件信息;  
SELECT *  
FROM E11714076_P  
WHERE COLOR='红';
```

PNO	PNAME	COLOR	WEIGHT
P1	螺母	红	12
P4	螺丝刀	红	14
P6	齿轮	红	30

The status bar at the bottom indicates that the query was executed successfully on the Localhost (10.0. RTM) server using the A76\Administrator (53) user, with 6 rows returned.

Microsoft SQL Server Management Studio

SQLQuery3.sql - Lo_ministrator (53):

```
--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';
```

结果

JNO	JNAME	CITY
1 J3	弹夹厂	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

属性

当前连接参数

集合状态

返回的行数 10

结束时间 2019/5/9 21:33:12

连接失败

名称 Localhost

启动时间 2019/5/9 21:33:12

占用时间 00:00:00.128

状态 打开

连接

连接名称 Localhost (A76/Administrator)

连接详细参数

SPID 53

登录名 A76\Administrator

返回的连接行数 10

服务器版本 10.0.1600

服务器名称 Localhost

连接结束时间 2019/5/9 21:33:12

连接开始时间 2019/5/9 21:33:12

连接占用时间 00:00:00.128

连接状态 打开

显示名称 Localhost

名称 连接的名称。

查询已成功执行。 Localhost (10.0 RTM) A76\Administrator (53) E11714076_SP数据库 00:00:00 10 行

Microsoft SQL Server Management Studio

SQLQuery4.sql - Lo_ministrator (52):

```
--查询供应工程“J1”零件的供应商信息;
SELECT SNO
FROM E11714076_SUP
WHERE SNO='J1';

--查询供应工程“J1”零件“P2”的供应商的信息;
SELECT SNO
FROM E11714076_SUP
WHERE SNO='J1' AND PNO='P2';

--查询P2零件的供应情况;
SELECT QTY
FROM E11714076_SUP
WHERE PNO='P2';
```

结果

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

QTY
1 100
2 100

属性

当前连接参数

集合状态

返回的行数 9

结束时间 2019/5/9 21:40:21

连接失败

名称 Localhost

启动时间 2019/5/9 21:40:21

占用时间 00:00:00.102

状态 打开

连接

连接名称 Localhost (A76/Administrator)

连接详细参数

SPID 52

登录名 A76\Administrator

返回的连接行数 9

服务器版本 10.0.1600

服务器名称 Localhost

连接结束时间 2019/5/9 21:40:21

连接开始时间 2019/5/9 21:40:21

连接占用时间 00:00:00.102

连接状态 打开

显示名称 Localhost

名称 连接的名称。

查询已成功执行。 Localhost (10.0 RTM) A76\Administrator (52) E11714076_SP数据库 00:00:00 9 行

Microsoft SQL Server Management Studio

SQLQuery4.sql - Lo_ministrator (52)

```

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

--查询供应量和在200-400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

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

属性

当前连接参数

集合状态

返回的行数: 8

结束时间: 2019/5/9 21:40:39

连接失败: 0

名称: Localhost

启动时间: 2019/5/9 21:40:39

占用时间: 00:00:00.131

状态: 打开

连接名称: Localhost (A76\Administrator)

连接详细参数

SPID: 52

登录名: A76\Administrator

返回的连接行数: 8

服务器版本: 10.0.1600

服务器名称: Localhost

连接结束时间: 2019/5/9 21:40:39

连接开始时间: 2019/5/9 21:40:39

连接占用时间: 00:00:00.131

连接状态: 打开

显示名称: Localhost

名称: 连接名称。

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

Microsoft SQL Server Management Studio

SQLQuery4.sql - Lo_ministrator (52)

```

--计算S1 供应量的最高、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

(无列名)	(无列名)	(无列名)
1	700	100

属性

当前连接参数

集合状态

返回的行数: 2

结束时间: 2019/5/9 21:40:59

连接失败: 0

名称: Localhost

启动时间: 2019/5/9 21:40:59

占用时间: 00:00:00.102

状态: 打开

连接名称: Localhost (A76\Administrator)

连接详细参数

SPID: 52

登录名: A76\Administrator

返回的连接行数: 2

服务器版本: 10.0.1600

服务器名称: Localhost

连接结束时间: 2019/5/9 21:40:59

连接开始时间: 2019/5/9 21:40:59

连接占用时间: 00:00:00.102

连接状态: 打开

显示名称: Localhost

名称: 连接名称。

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

The screenshot displays the Microsoft SQL Server Management Studio interface. The central pane shows a SQL query titled "SQLQuery4.sql - Lo_ministrator (52)". The query is as follows:

```

--分组计算每个供应商的最高、最低、平均供应量:
SELECT SNO, MAX(SPE), MIN(SPE), AVG(SPE)
FROM E11714076_SPJ
GROUP BY SNO;

--分组计算每个项目的最高、最低、平均供应量:
SELECT SNO, MAX(SPE), MIN(SPE), AVG(SPE)
FROM E11714076_SPJ
GROUP BY SNO;

```

The results pane shows two tables. The first table, titled "结果", has columns SNO, (无列名), (无列名), and (无列名). It contains 5 rows of data:

SNO	(无列名)	(无列名)	(无列名)
1	S1	700	100
2	S2	500	100
3	S3	200	200
4	S4	300	100
5	S5	500	100

The second table, titled "消息", has columns JNO, (无列名), (无列名), and (无列名). It contains 5 rows of data:

JNO	(无列名)	(无列名)	(无列名)
1	J1	400	100
2	J2	200	100
3	J3	300	100
4	J4	700	100
5	J5	400	400

The status bar at the bottom indicates "查询已成功执行。" (Query executed successfully.) and "Localhost (10.0 RTM) | A76\Administrator (52) | E11714076_SPJ数据库 | 00:00:00 | 10 行" (Localhost (10.0 RTM) | A76\Administrator (52) | E11714076_SPJ database | 00:00:00 | 10 rows).

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.