



哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

数据库系统

实验报告之二

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实验二 使用高级语言操作 MySQL 数据库

第 1 章 实验目的

学会使用高级语言访问 MySQL 数据库, 并进行查询。

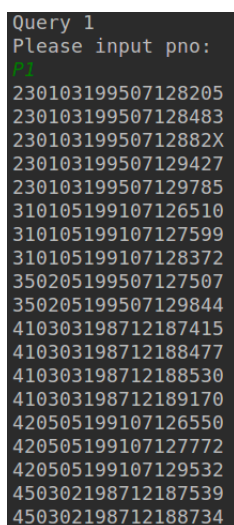
第 2 章 实验环境

- Ubuntu 16.04.5; MySQL Ver 14.14 Distrib 5.7.25
- Java version 1.8.0_181; IDEA 2018.3.5

第 3 章 实验过程及结果

```
1. String PARA_PNO = "%PNO%";
   String query = "SELECT ESSN FROM WORKS_ON
                  WHERE PNO = \" + PARA_PNO + "\"";
   System.out.println("Query " + count);
   System.out.println("Please input pno:");
   String pno = cin.nextLine();
   query = query.replace(PARA_PNO, pno);
   resultSet = statement.executeQuery(query);
   while (resultSet.next())
       System.out.println(resultSet.getString("ESSN"));
```

当输入%PNO% 为 P1 时, 实验结果如图3.1所示



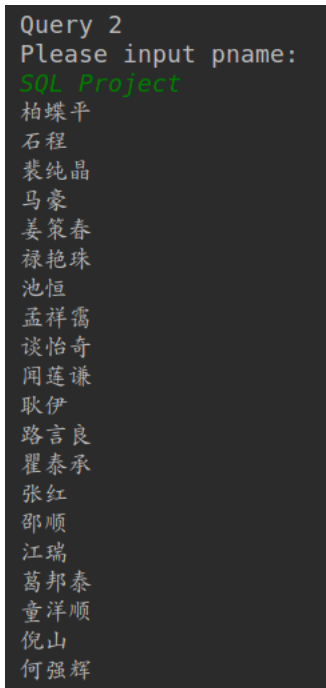
```
Query 1
Please input pno:
P1
230103199507128205
230103199507128483
23010319950712882X
230103199507129427
230103199507129785
310105199107126510
310105199107127599
310105199107128372
350205199507127507
350205199507129844
410303198712187415
410303198712188477
410303198712188530
410303198712189170
420505199107126550
420505199107127772
420505199107129532
450302198712187539
450302198712188734
```

图 3.1: 参加了项目编号为 %PNO% 的项目的员工姓名

```
2.    String PARA_PNAME = "%PNAME%";
    String query = "SELECT ENAME FROM EMPLOYEE, WORKS_ON, PROJECT
                    WHERE EMPLOYEE.ESSN = WORKS_ON.ESSN
                    AND PROJECT.PNO = WORKS_ON.PNO
                    AND PROJECT.PNAME = \" + PARA_PNAME + \"\"";

    System.out.println("Query " + count);
    System.out.println("Please input pname:");
    String pname = cin.nextLine();
    query = query.replace(PARA_PNAME, pname);
    resultSet = statement.executeQuery(query);
    while (resultSet.next())
        System.out.println(resultSet.getString("ENAME"));
```

当输入%PNAME% 为 SQL Project 时, 实验结果如图3.2所示.



```
Query 2
Please input pname:
SQL Project
柏蝶平
石程
裴纯晶
马豪
姜策春
禄艳珠
池恒
孟祥霭
谈怡奇
闻莲谦
耿伊
路言良
瞿泰承
张红
邵顺
江瑞
葛邦泰
童洋顺
倪山
何强辉
```

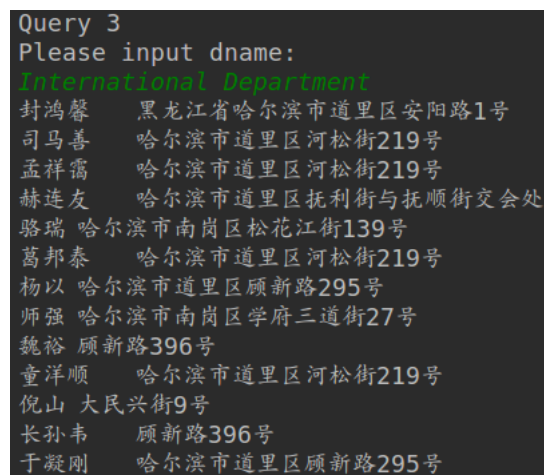
图 3.2: 参加了项目名为%PNAME% 的员工名字

```
3.    String PARA_DNAME = "%DNAME%";
    String query = "SELECT ENAME, ADDRESS FROM EMPLOYEE, DEPARTMENT
                    WHERE EMPLOYEE.DNO = DEPARTMENT.DNO
                    AND DEPARTMENT.DNAME = \" + PARA_DNAME + \"\"";

    System.out.println("Query " + count);
    System.out.println("Please input dname:");
```

```
String dname = cin.nextLine();
query = query.replace(PARA_DNAME, dname);
resultSet = statement.executeQuery(query);
while (resultSet.next())
    System.out.println(resultSet.getString("ENAME") +
        "\t" + resultSet.getString("ADDRESS"));
```

当输入%DNAME% 为 International Department 时, 实验结果如图3.3所示.



```
Query 3
Please input dname:
International Department
封鸿馨    黑龙江省哈尔滨市道里区安阳路1号
司马善    哈尔滨市道里区河松街219号
孟祥霏    哈尔滨市道里区河松街219号
赫连友    哈尔滨市道里区抚利街与抚顺街交会处
骆瑞    哈尔滨市南岗区松花江街139号
葛邦泰    哈尔滨市道里区河松街219号
杨以    哈尔滨市道里区顾新路295号
师强    哈尔滨市南岗区学府三道街27号
魏裕    顾新路396号
童洋顺    哈尔滨市道里区河松街219号
倪山    大民兴街9号
长孙韦    顾新路396号
于凝刚    哈尔滨市道里区顾新路295号
```

图 3.3: 在%DNAME% 工作的所有工作人员的名字和地址

```
4. String PARA_SALARY = "%SALARY%";
String PARA_DNAME = "%DNAME%";
String query = "SELECT ENAME, ADDRESS FROM EMPLOYEE, DEPARTMENT
                WHERE EMPLOYEE.DNO = DEPARTMENT.DNO
                AND DEPARTMENT.DNAME = \"\" + PARA_DNAME + \"\"
                AND SALARY < \"\" + PARA_SALARY;

System.out.println("Query " + count);
System.out.println("Please input dname:");
dname = cin.nextLine();
System.out.println("Please input salary:");
int salary = Integer.parseInt(cin.nextLine());
query = query.replace(PARA_DNAME, dname)
               .replace(PARA_SALARY, String.valueOf(salary));
resultSet = statement.executeQuery(query);
while (resultSet.next())
    System.out.println(resultSet.getString("ENAME") +
        "\t" + resultSet.getString("ADDRESS"));
```

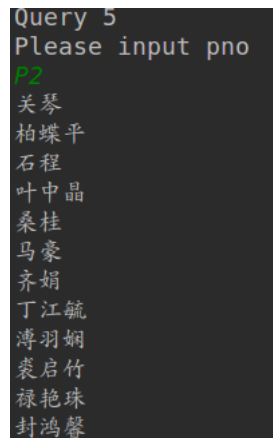
当输入%DNAME% 为 International Department, 输入%SALARY% 为 4000 时, 实验结果如图3.4所示.

```
Query 4
Please input dtype:
International Department
Please input salary:
4000
司马善 哈尔滨市道里区河松街219号
孟祥霭 哈尔滨市道里区河松街219号
赫连友 哈尔滨市道里区抚利街与抚顺街交会处
葛邦泰 哈尔滨市道里区河松街219号
杨以 哈尔滨市道里区顾新路295号
魏裕 顾新路396号
童洋顺 哈尔滨市道里区河松街219号
倪山 大民兴街9号
长孙韦 顾新路396号
于凝刚 哈尔滨市道里区顾新路295号
```

图 3.4: 在%DNAME% 工作且工资低于%SALARY% 的员工的名字和地址

```
5. String PARA_PNO = "%PNO%";
String query = "SELECT ENAME FROM EMPLOYEE
WHERE ESSN NOT IN (
SELECT DISTINCT ESSN
FROM WORKS_ON
WHERE WORKS_ON.PNO =\"" + PARA_PNO + "\")";
System.out.println("Query " + count);
System.out.println("Please input pno");
pno = cin.nextLine();
query = query.replace(PARA_PNO, pno);
resultSet = statement.executeQuery(query);
while (resultSet.next())
System.out.println(resultSet.getString("ENAME"));
```

当输入%PNO% 为 P2 时, 实验结果如图3.5所示.



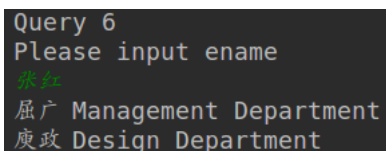
```
Query 5
Please input pno
P2
关琴
柏蝶平
石程
叶中晶
桑桂
马豪
齐娟
丁江毓
薄羽桐
裴启竹
禄艳珠
封鸿馨
```

图 3.5: 没有参加项目编号为%PNO% 的项目的员工姓名

```
6. String PARA_ENAME = "%ENAME%";
String query = "SELECT ENAME, DNAME FROM EMPLOYEE, DEPARTMENT
               WHERE EMPLOYEE.DNO = DEPARTMENT.DNO
               AND EMPLOYEE.SUPERSSN IN (
               SELECT ESSN FROM EMPLOYEE
               WHERE ENAME = '\" + PARA_ENAME + '\")";

System.out.println("Query " + count);
System.out.println("Please input ename");
String ename = cin.nextLine();
query = query.replace(PARA_ENAME, ename);
resultSet = statement.executeQuery(query);
while (resultSet.next())
    System.out.println(resultSet.getString("ENAME") +
                       "\t" + resultSet.getString("DNAME"));
```

当输入%ENAME% 为张红时, 实验结果如图3.6所示.



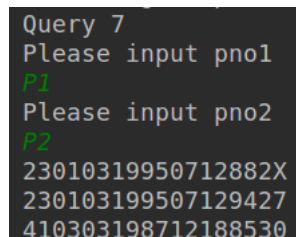
```
Query 6
Please input ename
张红
张红 Management Department
张红 Design Department
```

图 3.6: 由%ENAME% 领导的工作人员的姓名和所在的部门名字

```
7.    String PARA_PNO = "%PNO%";
    String query = "SELECT ESSN FROM WORKS_ON
                   WHERE PNO = \" + PARA_PNO + "1\"
                   AND ESSN IN (
                       SELECT ESSN FROM WORKS_ON
                       WHERE PNO = \" + PARA_PNO + "2\"";

    System.out.println("Query " + count);
    System.out.println("Please input pno1");
    pno = cin.nextLine();
    query = query.replace(PARA_PNO+1, pno);
    System.out.println("Please input pno2");
    pno = cin.nextLine();
    query = query.replace(PARA_PNO+2, pno);
    resultSet = statement.executeQuery(query);
    while (resultSet.next())
        System.out.println(resultSet.getString("ESSN"));
```

当输入%PNO1% 为 P1, %PNO% 为 P2 时, 实验结果如图3.7所示.



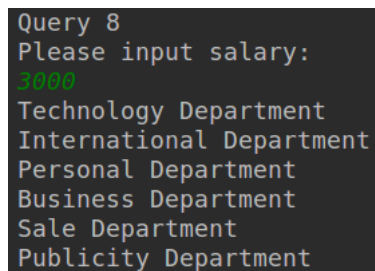
```
Query 7
Please input pno1
P1
Please input pno2
P2
23010319950712882X
230103199507129427
410303198712188530
```

图 3.7: 至少参加了项目编号为%PNO1% 和%PNO2% 的项目的员工号

```
8.    String PARA_SALARY = "%SALARY%";
    String query = "SELECT DNAME FROM EMPLOYEE, DEPARTMENT
                   WHERE EMPLOYEE.DNO = DEPARTMENT.DNO
                   GROUP BY DEPARTMENT.DNO
                   HAVING AVG(SALARY) < \" + PARA_SALARY;

    System.out.println("Query " + count);
    System.out.println("Please input salary:");
    salary = Integer.parseInt(cin.nextLine());
    query = query.replace(PARA_SALARY, String.valueOf(salary));
    resultSet = statement.executeQuery(query);
    while (resultSet.next())
        System.out.println(resultSet.getString("DNAME"));
```

当输入%SALARY% 为 3000 时, 实验结果如图3.8所示.



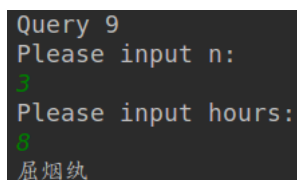
```
Query 8
Please input salary:
3000
Technology Department
International Department
Personal Department
Business Department
Sale Department
Publicity Department
```

图 3.8: 员工平均工资低于%SALARY% 元的部门名称

```
9. String PARA_N = "%N%";
String PARA_HOURS = "%HOURS%";
String query = "SELECT ENAME FROM EMPLOYEE, WORKS_ON
                WHERE EMPLOYEE.ESSN = WORKS_ON.ESSN
                GROUP BY EMPLOYEE.ESSN
                HAVING COUNT(PNO) >= " + PARA_N + "
                AND SUM(HOURS) <= " + PARA_HOURS;    ;

System.out.println("Query " + count);
System.out.println("Please input n:");
int n = Integer.parseInt(cin.nextLine());
query = query.replace(PARA_N, String.valueOf(n));
System.out.println("Please input hours:");
int hours = Integer.parseInt(cin.nextLine());
query = query.replace(PARA_HOURS, String.valueOf(hours));
resultSet = statement.executeQuery(query);
while (resultSet.next())
    System.out.println(resultSet.getString("ENAME"));
```

当输入%N% 为 3, 输入%HOURS% 为 8 时, 实验结果如图3.9所示.



```
Query 9
Please input n:
3
Please input hours:
8
屈烟纨
```

图 3.9: 至少参加了%N% 个项目且工作总时间不超过%HOURS% 小时的员工名字

第 4 章 实验心得

本次实验可以选择使用不同的高级语言来完成, 此处用 JAVA 来完成实验, 相比使用 C 连接数据库, 仅仅需要将相应的 jar 包导入即可. 总的来说, 实验的难度不大.