

# 综合实验 学生成绩管理模块开发

声明：本实验所有预期功能都已实现，所有代码均为原创

## 1. 实验内容

开发一个学生成绩管理模块，具体要求如下：

- 1). 在 Mysql 中创建数据库 SGM，并创建与学生成绩管理相关的 4 个表，具体为：创建学生表 student，该表的关系模式为 student (sid, name, sex)；创建课程表 course，该表的关系模式为 course (cid, name)；创建成绩表 grade，该表的关系模式为 grade (sid, cid, score)；创建教师表 teacher，该表的关系模式为 teacher (tid, name, password) 要求：字段的数据类型合理，并预先在学生表 student 和课程表 course 至少插入 3 条记录，即至少有 3 名学生，至少有 3 门课程；teacher 表中仅需有 1 条记录，用于 login.jsp 页面登录使用。（15%）
- 2). 创建名为 SGManager 的 web 应用程序，实现对于 SGM 中数据的管理。要求：编写实现一个 JavaBean 类 GradeBean，用于对 grade 表进行管理，具体为添加记录、删除记录、修改记录的方法；上述 Bean 在执行删除操作时，务必注意表与表之间的关联。比如删除一个学生，需要删除该学生所有的课程成绩。（15%）
- 3). 编写登录页面 login.jsp，作为应用程序的入口，使用 teacher 表中的信息进行登录，登录成功跳转到 main.jsp 页面，否则提示用户错误信息，重新输入。（15%）
- 4). 编写 main.jsp 页面，作为整个应用程序的首页，要集中展示学生信息、课程信息和学生成绩信息，并提供管理功能的链接，管理功能包括新增、修改和删除；（15%）
- 5). 关于新增成绩功能的实现，编写 addGrade.jsp 页面，负责实现为某门课的所有学生添加成绩功能；在 main.jsp 点击新增功能后，跳转到 addGrade.jsp 页面，完成成绩录入（最好课程和学生以选择的方式实现输入，而不是键盘输入）；当成功添加后，给出成功添加的提示框，用户确认后跳转到 main.jsp 页面；（20%）
- 6). 关于修改成绩功能的实现，可在 main.jsp 页面实现，具体方法可以是：在每一条成绩记录前增加一个单选框，用于表示当前记录是否被选中，当选中一条记录后，点击“修改成绩”按钮，则跳转到 modifyGrade.jsp 页面，当修改成功，给出修改成功的提示信息，再跳转回 main.jsp 页面，显示最新的内容；（10%）
- 7). 关于删除成绩功能的实现，同样在 main.jsp 页面实现，具体方法可以是：在每一条成绩记录前增加一个单选框，用于表示当前记录是否被选中，当选中一条或多条记录后，点击“删除成绩”按钮，提示用户是否真的要删除，用户选择“是”，则从数据

库中删除上述记录，提示删除成功，确定后刷新 main.jsp 页面。（10%）

8). 编写实现一个 JavaBean 类 StudentBean，用于对 student 表进行管理，具体为添加记录、删除记录、修改记录的方法；编写实现一个 JavaBean 类 CourseBean，用于对 course 表进行管理，具体为添加记录、删除记录、修改记录的方法；实现类似于 5)、6) 和 7) 的功能点，实现对于学生和课程的管理，特别注意学生或者课程的删除需要考虑的级联删除，即成绩表中某课程或某学生成绩的处理。（额外的 20%）

## 2. 完成情况

任务一至任务八**全部完成**，在 JavaBean 的编写中考虑到了级联删除，同时为数据库添加了外键约束，并且对各种输入进行处理，使得网站具有良好的容错性。

## 3. 程序输出结果截图

### 2.1 开发环境

使用 IntelliJ IDEA 2017 x64 开发平台，Tomcat 9.0.1 服务器，界面如下：

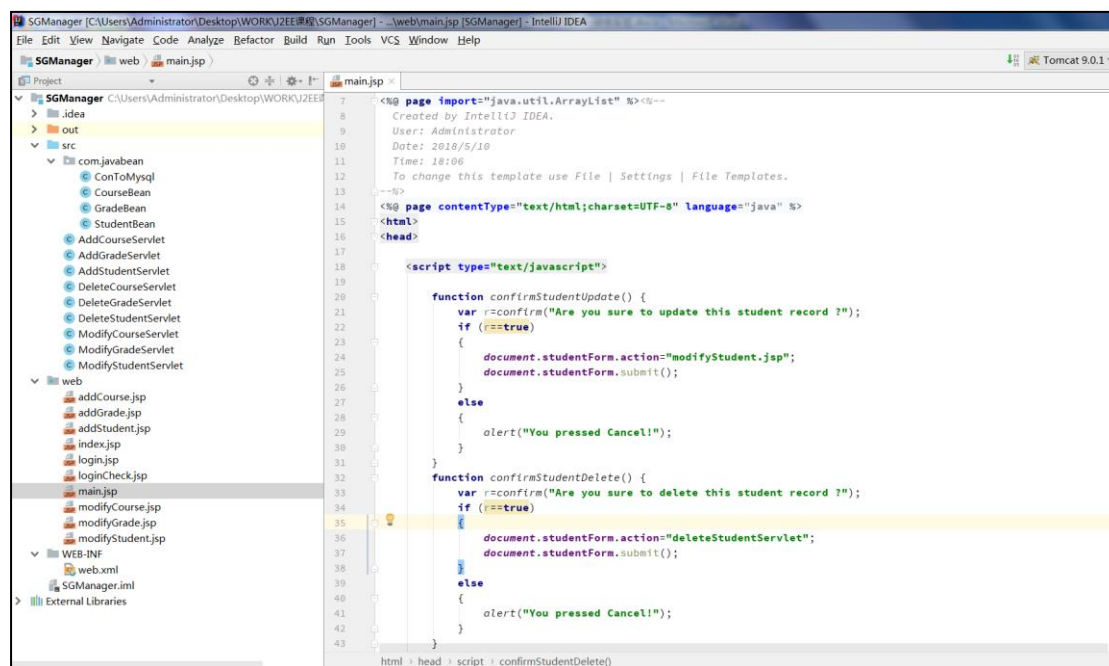


图 1 开发界面

### 2.2 mysql 数据库模型（任务一）

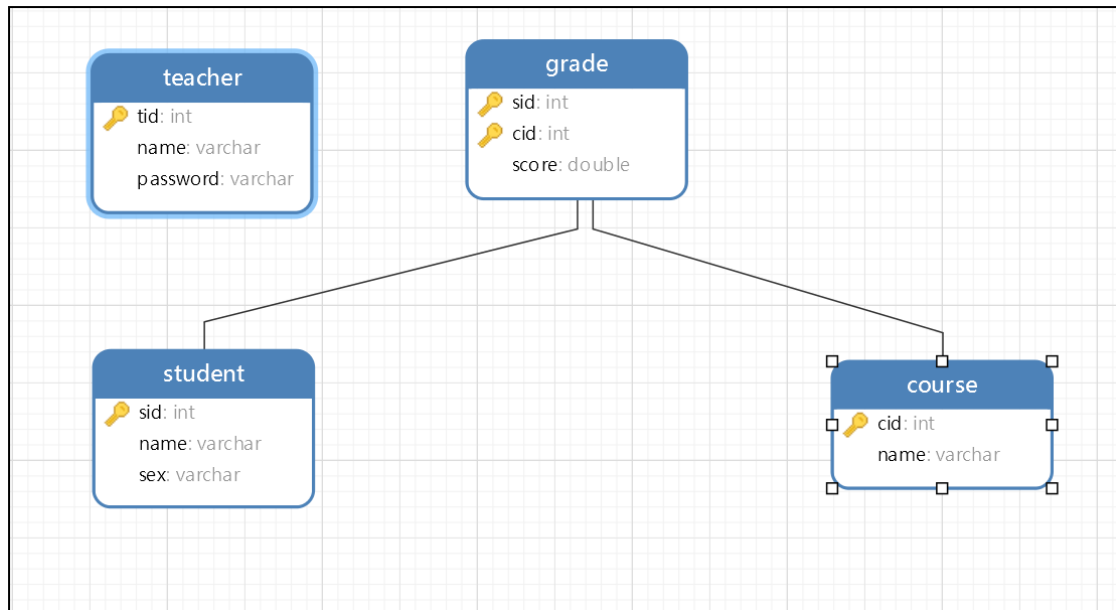


图 2 数据库结构

### 2.3 JavaBean 的编写 (任务二)

以 StudentBean 为例，实现了对 student 表操作的方法，可以级联删除和更新，具体代码见附录。

```

StudentBean.java x
1 package com.javabean;
2
3 import java.sql.*;
4
5 public class StudentBean {
6     private Connection connection;
7     private Statement statement;
8
9     public StudentBean() {...}
10
11
12
13
14
15
16
17
18
19     public boolean delete (int sid) throws SQLException {
20         boolean flag = statement.execute( sql: "DELETE FROM student WHERE sid = " + sid + ";" );
21         statement.execute( sql: "DELETE FROM grade WHERE sid = " + sid + ";" );
22         return flag;
23     }
24
25     public String update ( int oldSid, int newSid, String name, String sex ) throws SQLException {...}
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42     public String insert (int sid, String name, String sex) throws SQLException {...}
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57     public void errorProcess(Exception ex) {
58         ex.toString();
59     }
60
61
62
63
64
  
```

图 3 JavaBean 实例

### 2.4 登录页面 (任务三)

Login.jsp 页面



图 4 登陆界面

### loginCheck 错误处理界面

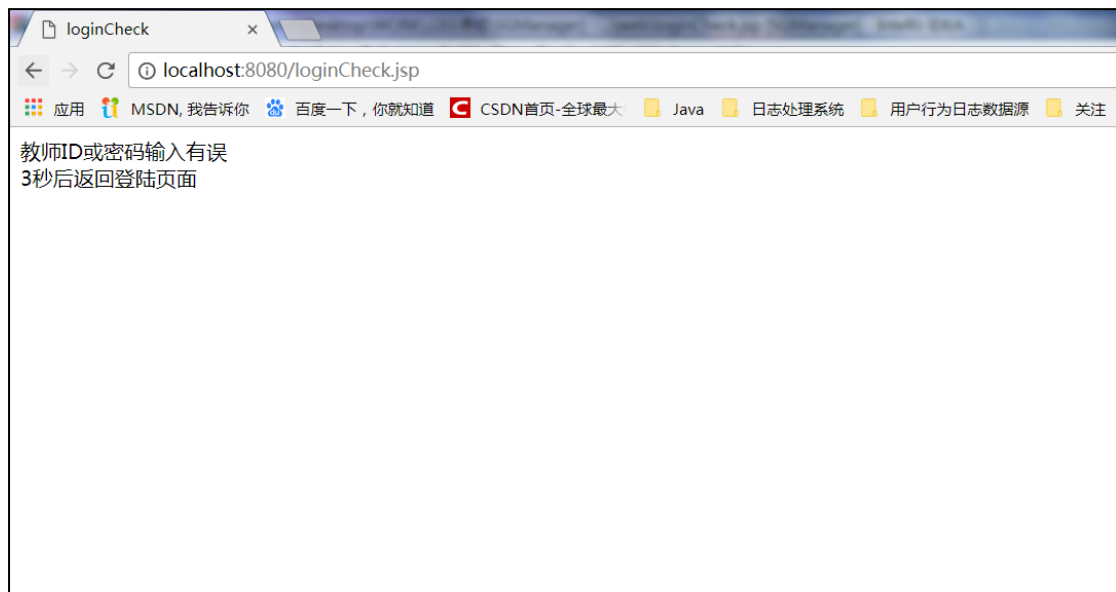


图 5 loginCheck 页面

loginCheck.jsp

```

loginCheck.jsp x
23 String pwd = request.getParameter("pwd").trim();
24
25 if(!tid.matches("[0-9]+")) {
26     out.print("教师ID输入格式不正确<br>3秒后返回登陆页面");
27     response.setHeader("refresh", "3;URL=login.jsp");
28 }
29 else if(tid.isEmpty()) {
30     out.print("教师ID不能为空!<br>3秒后返回登陆页面");
31     response.setHeader("refresh", "3;URL=login.jsp");
32 } else if (pwd.isEmpty()) {
33     out.print("令牌不能为空!<br>3秒后返回登陆页面");
34     response.setHeader("refresh", "3;URL=login.jsp");
35 } else {
36     Connection connection = new ConToMysql().getConnection();
37     try {
38         PreparedStatement pstmt = connection.prepareStatement("SELECT name FROM teacher WHERE tid = ? AND password = ?");
39         pstmt.setInt(1, Integer.valueOf(tid));
40         pstmt.setString(2, pwd);
41         ResultSet resultSet = pstmt.executeQuery();
42         if (!resultSet.next()) {
43             out.print("教师ID或密码输入有误<br>3秒后返回登陆页面");
44             response.setHeader("refresh", "3;URL=login.jsp");
45         }
46         else {
47             session.setAttribute("tid", tid);
48             session.setAttribute("name", resultSet.getString(1));
49             session.setAttribute("isLogin", (boolean) true);
50             //request.getRequestDispatcher("main.jsp").forward(request, response);
51             response.setHeader("refresh", "0;URL=/main");
52         }
53     } catch (SQLException ex) {
54         out.print(ex.toString());
55         out.print("数据库连接错误, 请检查网络稍后再试<br>若仍不成功请联系数据库管理员");
56     }
57 }

```

图 6 loginCheck.jsp 代码框架

## 2.5 管理主页面的设计与编写（任务四）

### 管理主页面

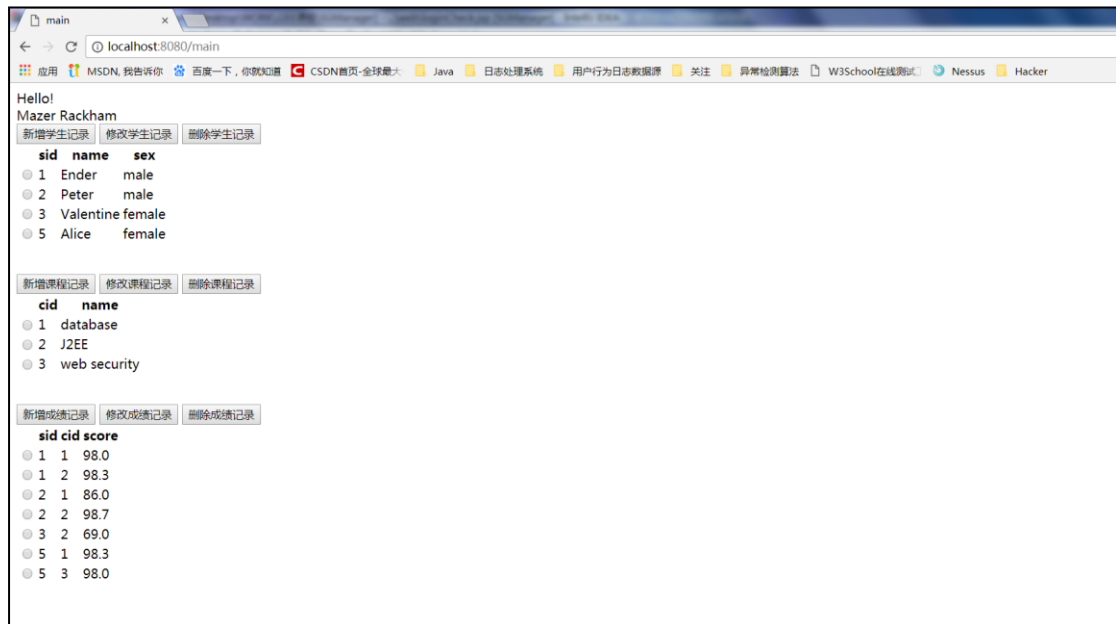


图 7 主页面

main.jsp

```
main.jsp x
13 <!--%>
14 <%@ page contentType="text/html;charset=UTF-8" language="java" %>
15 <html>
16 <head>
17 <!-- javascript代码 --%>
18 <script type="text/javascript"...>
94
95 <title>main</title>
96 </head>
97 <body>
98
99 <!--确认登录信息, 连接数据库--%>
100 <%...%>
119
120 <!-- 展示table Student --%>
121 <form name="studentForm" method="post" action=""...>
143 <br/>
144
145 <!-- 展示table Course --%>
146 <form name="courseForm" action="modifyCourse.jsp" method="post"...>
165 <br/>
166
167 <!-- 展示table Grade --%>
168 <form name="gradeForm" action="modifyGrade.jsp" method="post"...>
187
188 <%...%>
196
197
198 </body>
199 </html>
200
```

图 8 main.jsp 代码框架

## 2.6 新增成绩功能 (任务五)

addGrade x

localhost:8080/addGrade.jsp

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student: Ender(id: 1) course: J2EE(id: 2) grade: 94.5

提交 返回主界面

图 9 成绩添加页面

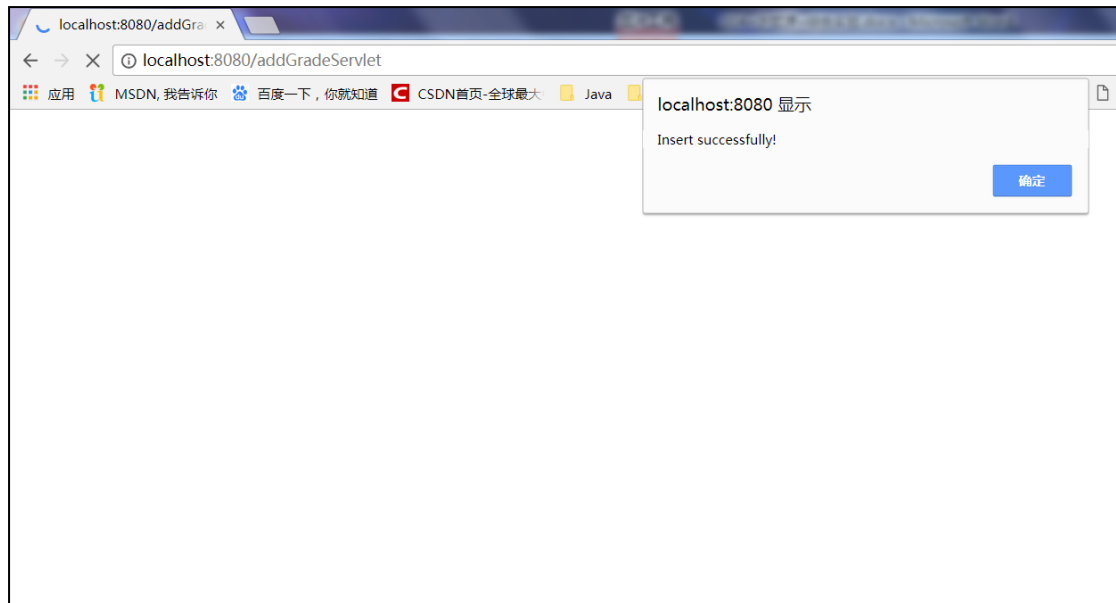


图 10 添加成功提示

add 功能由 addGrade.jsp 提交至 AddGradeServlet 完成

addGrade.jsp

```

18 </head>
19 <body>
20 <!-- ConToMysql() -->
21 <%...%>
45
46 <form method="post" action="addGradeServlet" onsubmit="">
47   student: <select name="sid">
48     <%
49       Iterator itStudent = student.iterator();
50       while (itStudent.hasNext()) {
51         String[] studentInfo = (String[]) itStudent.next();
52         String sid = studentInfo[0];
53         String sName = studentInfo[1];
54         out.print("<option value="+sid+">"+sName+"(id: "+sid+")"+</option>");
55       }
56     %>
57   </select>
58   course: <select name="cid">
59     <%
60       Iterator itCourse = course.iterator();
61       while (itCourse.hasNext()) {
62         String[] courseInfo = (String[]) itCourse.next();
63         String cid = courseInfo[0];
64         String cName = courseInfo[1];
65         out.print("<option value="+cid+">"+cName+"(id: "+cid+")"+</option>");
66       }
67     %>
68   </select>
69   grade: <input type="text" name="grade" id="grade" onkeyup="value=value.replace(/[^\-?\d.]/g, '')" value=""><br>
70   <input type="submit" value="提交" >
71   <a href="main.jsp"><button type="button">返回主界面</button></a>
72 </form>
73 </body>
74 </html>
75
76
html > body

```

图 11 addGrade.jsp 代码框架

## AddGradeServlet

```
1  import ...
11
12
13  public class AddGradeServlet extends HttpServlet {
14      @Override
15      protected void doPost (HttpServletRequest req, HttpServletResponse resp) throws IOException {
16          String sid = req.getParameter( s: "sid");
17          String cid = req.getParameter( s: "cid");
18          String grade = req.getParameter( s: "grade");
19          PrintWriter out = resp.getWriter();
20          GradeBean gradeBean = new GradeBean();
21          try {
22              String info = gradeBean.insert(Integer.valueOf(sid), Integer.valueOf(cid), Double.valueOf(grade));
23              out.print("<script>alert('"+info+"')</script>");
24              resp.setHeader( s: "refresh", s1: "0;URL=/addGrade");
25          } catch (SQLException ex) {
26              try {
27                  ex.printStackTrace();
28                  gradeBean.update(Integer.valueOf(sid), Integer.valueOf(cid), Double.valueOf(grade));
29                  out.print("<script>alert('record already exist, modify success!')</script>");
30                  resp.setHeader( s: "refresh", s1: "0;URL=/addGrade");
31              } catch (Exception ex2) {
32                  out.print("<script>alert('Error, maybe wrong input!')</script>");
33                  resp.setHeader( s: "refresh", s1: "0;URL=/addGrade");
34              }
35          }
36      }
37  }
38  }
```

图 12 AddGradeServlet.java 代码框架

## 2.7 修改成绩功能 (任务六)

### 确认提示框

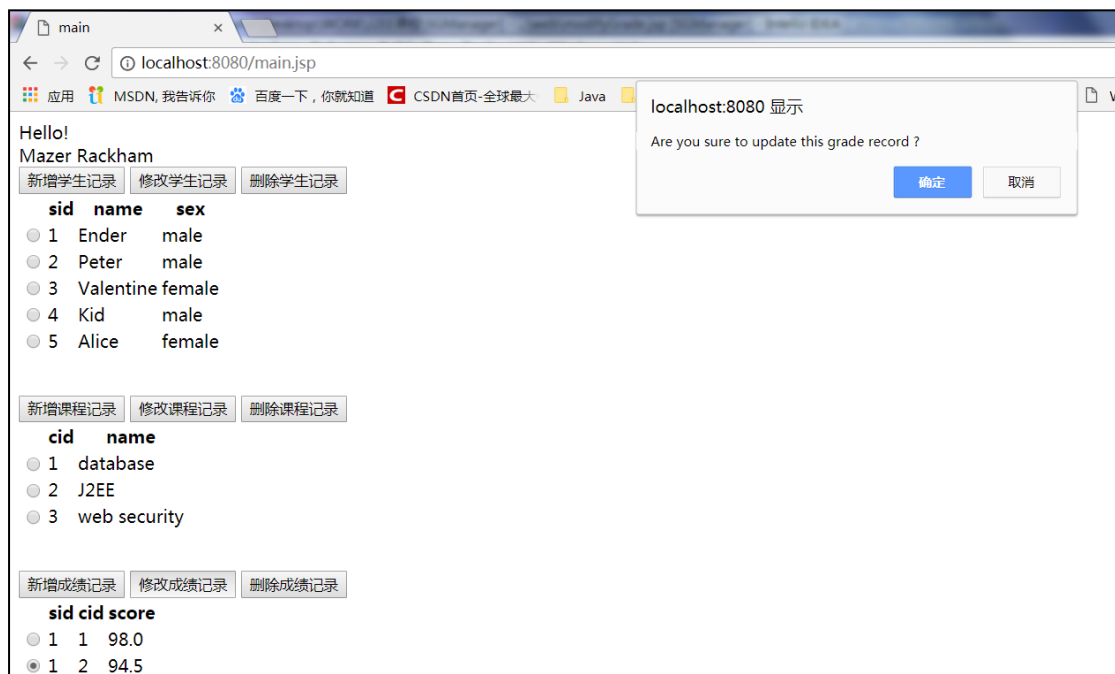


图 13 修改确认提示框





图 14 修改成绩页面

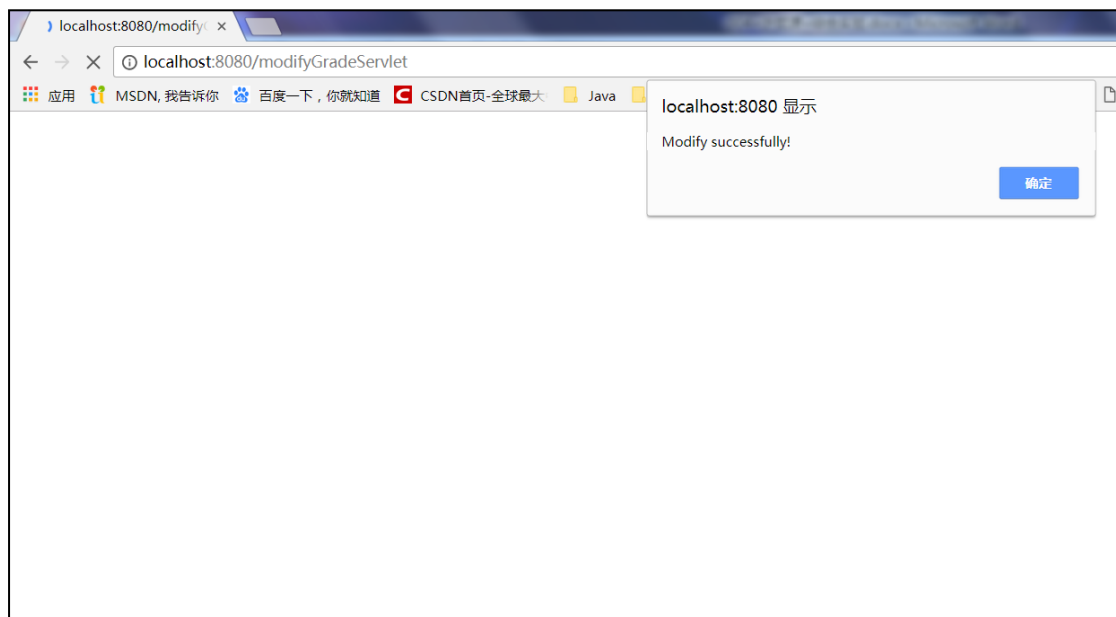


图 15 修改成功提示框

确认后自动跳转至主页面

add 功能由 modifyGrade.jsp 提交至 ModifyGradeServlet 完成

modifyGrade.jsp

```
1  <!-- ... -->
2  <%@ page contentType="text/html;charset=UTF-8" language="java" %>
3  <html>
4  <head>
5  <title>modifyGrade</title>
6  </head>
7  <body>
8  <%
9  String sid_cid = request.getParameter("grade");
10 String str[] = sid_cid.split("_");
11 String sid = str[0];
12 String cid = str[1];
13 %>
14 <form method="post" action="modifyGradeServlet">
15 <table>
16 <tr>
17 <td>Sid: </td><td><input type="text" readonly="readonly" name="sid" value="<%=sid%>" /></td>
18 </tr>
19 <tr>
20 <td>Cid: </td><td><input type="text" readonly="readonly" name="cid" value="<%=cid%>" /></td>
21 </tr>
22 <tr>
23 <td>new Grade: </td><td><input type="text" name="grade" onkeyup="value=value.replace(/[^\-?\.d.]/g, '')" value="" /></td>
24 </tr>
25 </table>
26 <input type="submit" value="提交" />
27 <a href="main.jsp"><button type="button">返回主界面</button></a>
28 </form>
29 </body>
30 </html>
```

图 16 modifyGrade.jsp 代码框架

对成绩输入进行检查，只能输入 DOUBLE 类型

ModifyGradeServlet

```
1  import ...
2
3  public class ModifyGradeServlet extends HttpServlet {
4  @Override
5  protected void doPost(HttpServletRequest req, HttpServletResponse resp) throws ServletException, IOException {
6  String sid = req.getParameter("sid");
7  String cid = req.getParameter("cid");
8  String grade = req.getParameter("grade");
9  PrintWriter out = resp.getWriter();
10
11  GradeBean gradeBean = new GradeBean();
12  try {
13  String info = gradeBean.update(Integer.parseInt(sid), Integer.parseInt(cid), Double.parseDouble(grade));
14  out.print("<script>alert('"+info+"')</script>");
15  resp.setHeader("refresh", "0;URL=/main");
16  } catch (Exception ex) {
17  out.print("<script>alert('sorry, something wrong!\nMaybe wrong input OR database error.*)</script>");
18  resp.setHeader("refresh", "0;URL=/main");
19  ex.printStackTrace();
20  }
21  }
22 }
```

图 17 ModifyGradeServlet 代码框架

## 2.8 删除成绩功能（任务七）

### 确认提示框

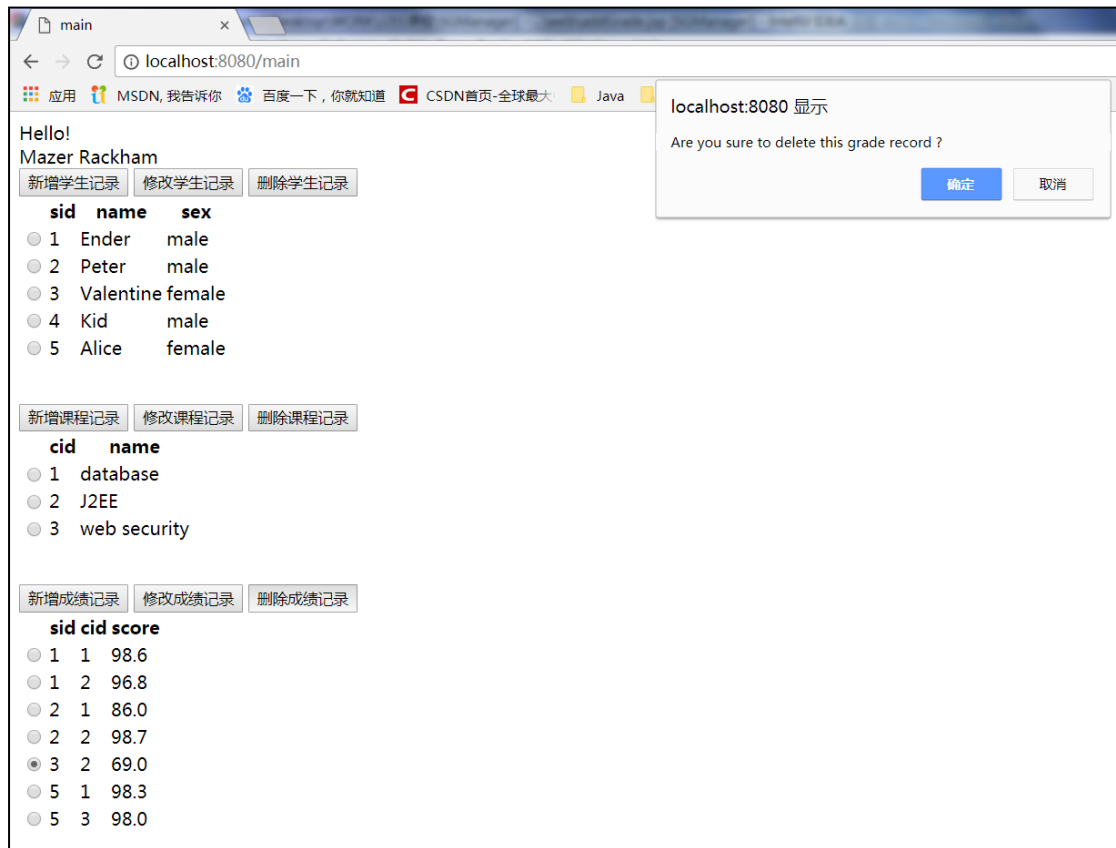


图 18 删除确认提示框

### 删除成功后返回主页面

删除成绩功能由 main.jsp 提交至 DeleteGradeServlet 实现

### main.jsp

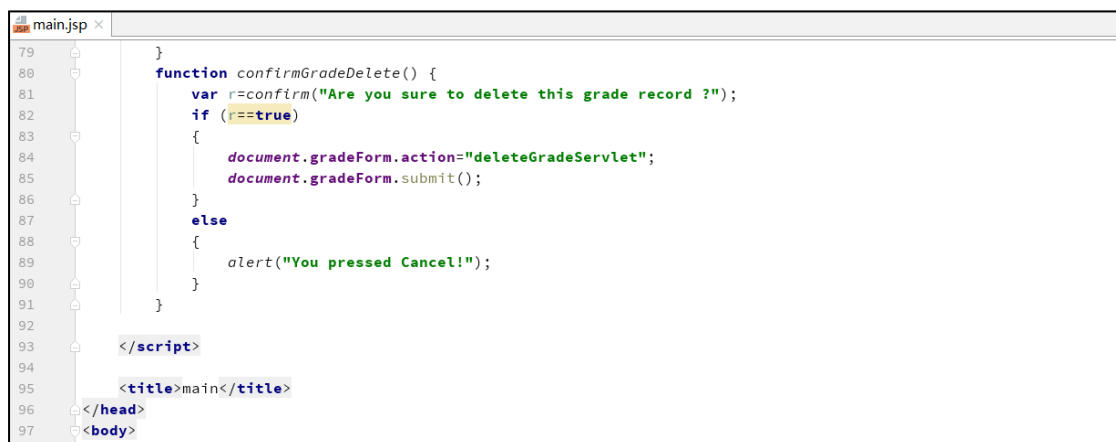


图 19 main.jsp 相关代码


## DeleteGradeServlet

```
1  import ...
2
3
4
5
6
7
8
9
10 public class DeleteGradeServlet extends HttpServlet {
11     @Override
12     protected void doPost(HttpServletRequest req, HttpServletResponse resp) throws ServletException, IOException {
13         String sid_cid = req.getParameter("grade");
14         String str[] = sid_cid.split(" ");
15         String sid = str[0];
16         String cid = str[1];
17         PrintWriter out = resp.getWriter();
18
19         GradeBean gradeBean = new GradeBean();
20         try {
21             boolean isSuccess = gradeBean.delete(Integer.valueOf(sid), Integer.valueOf(cid));
22             if (isSuccess) {
23                 out.print("<script>alert('Delete success!')</script>");
24                 resp.setHeader("refresh", "0;URL=/main");
25             }
26             else {
27                 out.print("<script>alert('Can not find this grade record!\\nIt has been deleted before!')</script>");
28                 resp.setHeader("refresh", "0;URL=/main");
29             }
30         } catch (Exception ex) {
31             ex.printStackTrace();
32         }
33     }
34 }
```

图 20 DeleteGradeServlet 代码框架

## 2.9 实现对于学生和课程的管理（任务八）

### ● 新增学生



addStudent

localhost:8080/addStudent.jsp

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sid: 5

studentName: Bob

sex: male

提交 返回主界面

图 21 新增学生信息页面

- 修改学生记录



图 22 修改学生信息页面

- 新增课程



图 23 新增课程信息页面

- 修改课程



图 24 修改成绩页面

### 3、遇到的问题及解决办法

- 在整个项目的完成过程中遇到了很多问题，尤其是不知道如何协调好各个 jsp 和 servlet 之间的关系，实现松耦合。
  - < 解决方案：在编写项目的过程中不断的阅读资料，对已经完成的部分进行修改 >
- 在制作网页时没有学过 javascript，没有办法调出 alert。
  - < 解决方案：查阅资料，学习了 javascript 语法，在客户网页中调用了很多 js 函数 >
- 在考虑如何返回错误信息时，一开始遇到很多难题。
  - < 解决方案：在编写方法设定返回值类型为 String，在调用时输出错误信息 >

## 4、结果分析和收获

实验结果和预期一致，在此过程中学会了如何使用 JSP、servlet、JavaBean 和 JDBC 来制作一个 J2EE 项目，增加了编程实践经验。

## 5、关键代码

因代码量过多，完整代码附录在同一文件下，此处仅给出范例。

### a) main.jsp

```
<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>
  <!-- javascript 代码 -->
  <script type="text/javascript">

    function confirmStudentUpdate() {
      var r=confirm("Are you sure to update this student record ?");
      if (r==true)
      {
        document.studentForm.action="modifyStudent.jsp";
        document.studentForm.submit();
      }
      else
      {
        alert("You pressed Cancel!");
      }
    }
    function confirmStudentDelete() {
      var r=confirm("Are you sure to delete this student record ?");
      if (r==true)
      {
        document.studentForm.action="deleteStudentServlet";
        document.studentForm.submit();
      }
      else
      {
        alert("You pressed Cancel!");
      }
    }
    function confirmCourseUpdate() {
      var r=confirm("Are you sure to update this course record ?");
      if (r==true)
      {
        document.courseForm.action="modifyCourse.jsp";
        document.courseForm.submit();
      }
      else
      {
        alert("You pressed Cancel!");
      }
    }
    function confirmCourseDelete() {
      var r=confirm("Are you sure to delete this course record ?");
      if (r==true)
```

```

        {
            document.courseForm.action="deleteCourseServlet";
            document.courseForm.submit();
        }
        else
        {
            alert("You pressed Cancel!");
        }
    }
}
function confirmGradeUpdate() {
    var r=confirm("Are you sure to update this grade record ?");
    if (r==true)
    {
        document.gradeForm.action="modifyGrade.jsp";
        document.gradeForm.submit();
    }
    else
    {
        alert("You pressed Cancel!");
    }
}
function confirmGradeDelete() {
    var r=confirm("Are you sure to delete this grade record ?");
    if (r==true)
    {
        document.gradeForm.action="deleteGradeServlet";
        document.gradeForm.submit();
    }
    else
    {
        alert("You pressed Cancel!");
    }
}
}
</script>

<title>main</title>
</head>
<body>

<!-- 确认登录信息，连接数据库-->
<%
    boolean isLogin =false;
    try {
        isLogin = (boolean) session.getAttribute("isLogin");
    } catch (Exception ex ) {
        isLogin =false;
    }
    if (isLogin) {
        out.print("请先登录，3 秒后跳转至登录页面");
        response.setHeader("refresh", "3;URL=login.jsp");
    } else {
        out.print("Hello!<br>");
        out.print(session.getAttribute("name")+<br>");
        try {
            Connection connection = new ConToMysql().getConnection();
            ResultSet rsStudent = connection.createStatement().executeQuery("SELECT * FROM
student");
            ResultSet rsCourse = connection.createStatement().executeQuery("SELECT * FROM
course");
            ResultSet rsGrade = connection.createStatement().executeQuery("SELECT * FROM grade");
        }
    }
%>

```



```

<!-- 展示 table Student -->
<form name="studentForm" method="post" action="">
  <a href="addStudent.jsp"><button type="button">新增学生记录</button></a>
  <button type="button" onclick="confirmStudentUpdate()">修改学生记录</button>
  <button type="button" onclick="confirmStudentDelete()">删除学生记录</button>
  <table>
    <tr>
      <th></th>
      <th>sid</th>
      <th>name</th>
      <th>sex</th>
    </tr>
  </table>
  <%
    while (rsStudent.next()) {

      out.print("<tr>");
      out.print("<td><input type='radio' name='student'
value='"+rsStudent.getInt(1)+"'/></td>");
      out.print("<td>" + rsStudent.getInt(1) + "</td><td>" + rsStudent.getString(2) +
"</td><td>" + rsStudent.getString(3) + "</td>");
      out.print("</tr>");
    }
  %>
</table>
</form>
<br/>

<!-- 展示 table Course -->
<form name="courseForm" action="modifyCourse.jsp" method="post">
  <a href="addCourse.jsp"><button type="button">新增课程记录</button></a>
  <button type="button" onclick="confirmCourseUpdate()">修改课程记录</button>
  <button type="button" onclick="confirmCourseDelete()">删除课程记录</button>
  <table>
    <tr>
      <th></th><th>cid</th><th>name</th>
    </tr>
  </table>
  <%
    while (rsCourse.next()) {

      out.print("<tr>");
      out.print("<td><input type='radio' name='course'
value='"+rsCourse.getInt(1)+"'/></td>");
      out.print("<td>" + rsCourse.getInt(1) + "</td><td>" + rsCourse.getString(2) + "</td>");
      out.print("</tr>");
    }
  %>
</table>
</form>
<br/>

<!-- 展示 table Grade -->
<form name="gradeForm" action="modifyGrade.jsp" method="post">
  <a href="addGrade.jsp"><button type="button">新增成绩记录</button></a>
  <button type="button" onclick="confirmGradeUpdate()">修改成绩记录</button>
  <button type="button" onclick="confirmGradeDelete()">删除成绩记录</button>
  <table>
    <tr>
      <th></th><th>sid</th><th>cid</th><th>score</th>
    </tr>
  </table>
  <%
    while (rsGrade.next()) {
      out.print("<tr>");
    }
  %>

```

```

        out.print("<td><input type='radio' name='grade'
value='"+rsGrade.getInt(1)+"_'"+rsGrade.getInt(2)+"'/></td>");
        out.print("<td>" + rsGrade.getInt(1) + "</td><td>" + rsGrade.getInt(2) + "</td><td>"
+ rsGrade.getString(3) + "</td>");
        out.print("</tr>");
    }
%>

</table>
</form>

<%
    } catch (SQLException ex) {

        out.print("服务器与数据库连接错误, 请联系管理员<br>");
        out.print(ex.toString());
    }
%>

</body>
</html>

```

## b) addGrade.jsp

```

<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>

    <title>addGrade</title>
</head>
<body>
<!-- ConToMysql() -->
<%
    ArrayList<String[]> student = new ArrayList<String[]>();
    ArrayList<String[]> course = new ArrayList<String[]>();
    try {
        Connection connection = new ConToMysql().getConnection();
        ResultSet rsStudent = connection.createStatement().executeQuery("SELECT * FROM
student");
        ResultSet rsCourse = connection.createStatement().executeQuery("SELECT * FROM course");

        student.clear();
        while (rsStudent.next()) {
            student.add(new String[]{rsStudent.getString(1),rsStudent.getString(2)});
        }

        course.clear();
        while (rsCourse.next()) {
            course.add(new String[]{rsCourse.getString(1),rsCourse.getString(2)});
        }

    } catch (SQLException ex) {
        out.print("服务器与数据库连接错误, 请联系管理员<br>");
        out.print(ex.toString());
    }
%>

<form method="post" action="addGradeServlet" onsubmit="">

```

```

student: <select name="sid">
<%
    Iterator itStudent = student.iterator();
    while (itStudent.hasNext()) {
        String[] studentInfo = (String[]) itStudent.next();
        String sid = studentInfo[0];
        String sName = studentInfo[1];
        out.print("<option value="+sid+">" +sName+"(id: "+sid+")"+"</option>");
    }
    %>
</select>
course: <select name="cid">
<%
    Iterator itCourse = course.iterator();

    while (itCourse.hasNext()) {
        String[] courseInfo = (String[]) itCourse.next();
        String cid = courseInfo[0];
        String cName = courseInfo[1];
        out.print("<option value="+cid+">" +cName+"(id: "+cid+")"+"</option>");
    }
    %>
</select>
grade: <input type="text" name="grade" id="grade" onkeyup="value=value.replace(/[^\-
?\d.]/g, '')" value=""><br>
<input type="submit" value="提交" >
<a href="main.jsp"><button type="button">返回主界面</button></a>
</form>
</body>
</html>

```

### c) modifyGrade.jsp

```

<%--
    Created by IntelliJ IDEA.
    User: Administrator
    Date: 2018/5/10
    Time: 18:55
    To change this template use File | Settings | File Templates.
--%>
<% @ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>
    <title>modifyGrade</title>
</head>
<body>
<%
    String sid_cid = request.getParameter("grade");
    String str[] = sid_cid.split("_");
    String sid = str[0];
    String cid = str[1];
    %>

<form method="post" action="modifyGradeServlet">
    <table>
        <tr>
            <td>Sid: </td><td><input type="text" readonly="readonly" name="sid"
value="<%=sid%>" /></td>
        </tr>
        <tr>
            <td>Cid: </td><td><input type="text" readonly="readonly" name="cid"

```

```

value="<%=cid%>" /></td>
</tr>
<tr>
<td>new Grade: </td><td><input type="text" name="grade"
onkeyup="value=value.replace(/[^\-?\.d.]/g, '')" value="" /></td>
</tr>
</table>
<input type="submit" value="提交" />
<a href="main.jsp"><button type="button">返回主界面</button></a>
</form>
</body>
</html>

```

## d) ConToMysql.java

```

package com.javabean;

import java.sql.*;

public class ConToMysql {

    private Connection connection;

    public ConToMysql () {
        try {
            Class.forName("com.mysql.jdbc.Driver");
            String url = "jdbc:mysql://localhost:3306/sgm";
            connection = DriverManager.getConnection(url,"root","root");

        } catch (Exception ex) {
            ex.printStackTrace();
        }
    }

    public Connection getConnection() {
        return connection;
    }

}

```

## e) GradeBean.java

```

package com.javabean;

import com.mysql.jdbc.exceptions.jdbc4.MySQLIntegrityConstraintViolationException;
import java.sql.*;

public class GradeBean {

    private Connection connection;
    private Statement statement;
    public GradeBean() {
        try {
            connection = new ConToMysql().getConnection();

```

```

        statement = connection.createStatement();
    } catch (SQLException ex) {
        ex.printStackTrace();
    }
}

public boolean delete (int sid,int cid) throws SQLException {
    boolean flag = statement.execute("DELETE FROM grade WHERE sid=" + sid + " AND cid
    =" +cid+";");
    return flag;
}

public String update ( int sid, int cid, double score ) throws SQLException {
    if (score<0 || score>100) {
        return "Fail, grade must between 0~100!";
    } else {
        PreparedStatement preparedStatement = connection.prepareStatement("UPDATE grade
        SET score=? WHERE sid = ? AND cid = ? ");
        preparedStatement.setDouble(1, score);
        preparedStatement.setInt(2, sid);
        preparedStatement.setInt(3, cid);
        boolean flag = preparedStatement.executeUpdate();
        if (flag)
            return "Modify successfully!";
        else
            return "Fail, maybe this record was deleted.";
    }
}

public String insert (int sid, int cid, double score ) throws SQLException {
    if (score<0 || score>100) {
        return "Wrong input, grade must between 0~100!";
    } else {
        PreparedStatement preparedStatement = connection.prepareStatement("INSERT INTO
        grade VALUE (?,?,?)");
        preparedStatement.setInt(1,sid);
        preparedStatement.setInt(2,cid);
        preparedStatement.setDouble(3,score);
        preparedStatement.execute();
        return "Insert successfully!";
    }
}

public void errorProcess(Exception ex) {
    ex.toString();
}
}

```

## f) AddGradeServlet.java

```

import com.javabean.GradeBean;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.SQLException;

```

```

public class AddGradeServlet extends HttpServlet {
    @Override
    protected void doPost (HttpServletRequest req, HttpServletResponse resp) throws IOException {
        String sid = req.getParameter("sid");
        String cid = req.getParameter("cid");
        String grade = req.getParameter("grade");
        PrintWriter out = resp.getWriter();
        GradeBean gradeBean = new GradeBean();
        try {
            String info = gradeBean.insert(Integer.valueOf(sid), Integer.valueOf(cid),
Double.valueOf(grade));
            out.print("<script>alert('"+info+"')</script>");
            resp.setHeader("refresh", "0;URL=/addGrade");
        } catch (SQLException ex) {
            try {
                ex.printStackTrace();
                gradeBean.update(Integer.valueOf(sid), Integer.valueOf(cid), Double.valueOf(grade));
                out.print("<script>alert('recode already exist, modify success!')</script>");
                resp.setHeader("refresh", "0;URL=/addGrade");
            } catch (Exception ex2) {
                out.print("<script>alert('Error, maybe wrong input!')</script>");
                resp.setHeader("refresh", "0;URL=/addGrade");
            }
        }
    }
}

```

## g) ModifyGradeServlet.java

```

import com.javabean.CourseBean;
import com.javabean.GradeBean;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.SQLException;

public class ModifyGradeServlet extends HttpServlet {
    @Override
    protected void doPost(HttpServletRequest req, HttpServletResponse resp) throws ServletException,
IOException {
        String sid = req.getParameter("sid");
        String cid = req.getParameter("cid");
        String grade = req.getParameter("grade");
        PrintWriter out = resp.getWriter();

        GradeBean gradeBean = new GradeBean();
        try {
            String info = gradeBean.update(Integer.parseInt(sid),Integer.parseInt(cid),
Double.parseDouble(grade));
            out.print("<script>alert('"+info+"')</script>");
            resp.setHeader("refresh", "0;URL=/main");
        } catch (Exception ex) {
            out.print("<script>alert('sorry, something wrong!\nMaybe wrong input OR database
error.')</script>");
            resp.setHeader("refresh", "0;URL=/main");
        }
    }
}

```

```

        ex.printStackTrace();
    }
}

```

## h) DeleteGradeServlet.java

```

import com.javabean.GradeBean;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;

public class DeleteGradeServlet extends HttpServlet {
    @Override
    protected void doPost(HttpServletRequest req, HttpServletResponse resp) throws ServletException,
    IOException {
        String sid_cid = req.getParameter("grade");
        String str[] = sid_cid.split("_");
        String sid = str[0];
        String cid = str[1];
        PrintWriter out = resp.getWriter();

        GradeBean gradeBean = new GradeBean();
        try {
            boolean isSuccess = gradeBean.delete(Integer.valueOf(sid), Integer.valueOf(cid));
            if( isSuccess ) {
                out.print("<script>alert('Delete success!')</script>");
                resp.setHeader("refresh", "0;URL=/main");
            }
            else {
                out.print("<script>alert('Can not find this grade record!\nIt has been deleted
before!')</script>");
                resp.setHeader("refresh", "0;URL=/main");
            }
        } catch (Exception ex) {
            ex.printStackTrace();
        }
    }
}

```