第二章 SpringMVC(二)

-高级参数绑定、文件上传、JSON处理2018/11/13 [泽林.王峰]

授课目标

1、 上章回顾

2、 高级参数绑定

3、 Spring文件上传、下载

4、 Spring-Ajax异步处理

授课内容

1、 上章回顾

2、 高级参数绑定

2.1）日期型数据的绑定：

2.1.1)在resource/spring/applicationContext.xml文件中添加转换器配置

```xml
1  <?xml version="1.0" encoding="UTF-8"?>
2  <beans xmlns="http://www.springframework.org/schema/beans"
3         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4         xmlns:context="http://www.springframework.org/schema/context"
5         xmlns:mvc="http://www.springframework.org/schema/mvc"
6         xsi:schemaLocation="http://www.springframework.org/schema/beans
   http://www.springframework.org/schema/beans/spring-beans.xsd
   http://www.springframework.org/schema/context
   http://www.springframework.org/schema/context/spring-context.xsd
   http://www.springframework.org/schema/cache
   http://www.springframework.org/schema/cache/spring-cache.xsd
   http://www.springframework.org/schema/mvc
   http://www.springframework.org/schema/mvc/spring-mvc.xsd">
7      <!--1.配置springmvc中的控制器的扫描包-->
8      <context:component-scan base-package="com.zelin.web.controller"/>
9      <!--2.使得注解的方式添加处理器映射器及处理器适配器-->
10     <mvc:annotation-driven conversion-service="conversionService"/>
11
12     <!--配置转换器-->
13     <bean id="conversionService"
   class="org.springframework.format.support.FormattingConversionServiceFactoryBean">
14         <property name="converters">
```

```xml
            <list>
                <bean class="com.zelin.web.converter.DateConverter"/>
            </list>
        </property>
    </bean>

    <!--3.添加视图解析器-->
    <bean class="org.springframework.web.servlet.view.InternalResourceViewResolver">
        <property name="prefix" value="/WEB-INF/jsp/"/>
        <property name="suffix" value=".jsp"/>
    </bean>
</beans>
```

2.1.2)在com.zelin.web.converter包下添加转换器

```java
/**
 * 定义转换器(将String转换为Date类型)
 */
public class DateConverter implements Converter<String,Date> {
    @Override
    public Date convert(String s) {
        SimpleDateFormat sdf = new SimpleDateFormat("yyyy-MM-dd");
        try {
            return sdf.parse(s);
        } catch (ParseException e) {
            e.printStackTrace();
            return null;
        }
    }
}
```

2.1.3)列表页面/WEB-INF/jsp/student/list.jsp

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
<%@ taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<title>Insert title here</title>
<!-- 引入bs库 -->
<%@ include file="/bs.jsp" %>

<style type="text/css">
    .container{
        margin-top:20px;
    }
    .table td{
```

```
18              text-align:center;
19          }
20      .panel-footer{
21              text-align:right;
22          }
23 </style>
24 </head>
25 <body>
26      <div class="container">
27          <div class="panel panel-primary">
28              <div class="panel-heading">
29                  <h4>学生管理系统</h4>
30              </div>
31              <form action="${base }/student/update.action" method="post" id='form1'>
32              <table class="table table-hover">
33                  <tr>
34                      <td>选择</td>
35                      <td>学生姓名</td>
36                      <td>学生性别</td>
37                      <td>学生年龄</td>
38                      <td>所在班级</td>
39                      <td>家庭住址</td>
40                      <td>出生日期</td>
41                  </tr>
42                  <c:forEach items="${students }" var="stud" varStatus="vs">
43                      <input type="hidden" name="students[${vs.index}].sid"
   value="${stud.sid }">
44                      <tr>
45                          <td><input type="checkbox" name="ids" value="${stud.sid }">
   </td>
46                          <td><input name="students[${vs.index}].sname"
   value="${stud.sname }"></td>
47                          <td>
48                              <input type="radio" name="students[${vs.index}].sex"
   value="男" ${stud.sex=='男'?'checked':'' }>男
49                              <input type="radio" name="students[${vs.index}].sex"
   value="女" ${stud.sex=='女'?'checked':'' }>女
50
51                          </td>
52                          <td><input name="students[${vs.index}].age"
   value="${stud.age }"></td>
53                          <td>
54                              <select name="students[${vs.index}].classes.cid">
55                                  <c:forEach items="${classes }" var="c">
56                                      <option value="${c.cid }"
   ${c.cid==stud.cid?'selected':'' }>${c.cname }</option>
57                                  </c:forEach>
58                              </select>
59                          </td>
60                          <td><input name="students[${vs.index}].addr"
   value="${stud.addr }"></td>
61                          <td>

62                              <!-- 对日期进行格式化处理 -->
```

```
63                          <input name="students[${vs.index }].birth"
64                          value='<fmt:formatDate value="${stud.birth}"
   pattern="yyyy-MM-dd"/>'>
65                      </td>
66                  </tr>
67              </c:forEach>
68          </table>
69          </form>
70          <div class="panel-footer">
71              <a href="${base}/student/toadd.action" class="btn btn-warning
   glyphicon glyphicon-plus">添加学生</a>
72              <a href="javascript:updateStudent()" class="btn btn-info glyphicon
   glyphicon-pencil">批量修改学生</a>
73              <a href="javascript:deleteStudent()" class="btn btn-danger glyphicon
   glyphicon-remove">批量删除学生</a>
74          </div>
75      </div>
76   </div>
77   </body>
78   <script>
79      //修改学生
80      function updateStudent(){
81          document.forms[0].submit();
82      }
83      //删除学生
84      function deleteStudent(){
85          //1.取得所选择的jquery元素
86          var checkboxes = $("input[name=ids]:checked");
87          //2.拼凑要删除学生的主键sid的字符串
88          var ids = "";
89          $.each(checkboxes,function(i,v){
90              //去掉最后一个逗号的方法一：
91              /* if(i == checkboxes.length-1){
92                  ids += $(v).val()
93              }else{
94                  ids += $(v).val()+","
95              } */
96
97              ids += $(v).val()+",";
98          })
99          //去掉最后一个逗号的方法二：
100         ids = ids.substr(0,ids.length-1);
101         location.href="${base}/student/delete.action?ids="+ids;
102     }
103  </script>
104  </html>
```

2.1.4)列表页面/WEB-INF/jsp/student/add.jsp页面

```
1   <%@ page language="java" contentType="text/html; charset=UTF-8"
2       pageEncoding="UTF-8"%>

3   <%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
```

```
4   <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
    "http://www.w3.org/TR/html4/loose.dtd">
5   <html>
6   <head>
7   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
8   <title>添加学生页面</title>
9   <%@ include file="/bs.jsp" %>
10  </head>
11  <body>
12      <div class="container">
13          <h1 class="page-header">
14              学生管理系统-<small>添加学生功能</small>
15          </h1>
16          <div class="col-md-6">
17              <div class="panel panel-primary">
18                  <div class="panel-heading">
19                      <div class="h4">学生管理-添加学生</div>
20                  </div>
21                  <div class="panel-body">
22                      <form
23                          action="${base}/student/add.action"
24                          method="post" class="form-horizontal">
25                          <div class="form-group">
26                              <label for="sname" class="col-sm-2 control-label">学生姓名
    </label>
27                              <div class="col-sm-10">
28                                  <input type="text" name="sname" class="form-control"
    id="sname">
29                              </div>
30                          </div>
31                          <div class="form-group">
32                              <label class="col-sm-2 control-label">学生性别 </label>
33                              <div class="col-sm-10">
34                                  <div class="radio-inline">
35                                      <label> <input type="radio" value="男" name="sex"
36                                          id="sex1">男
37                                      </label>
38                                  </div>
39                                  <div class="radio-inline">
40                                      <label> <input type="radio" value="女" name="sex"
41                                          id="sex2">女
42                                      </label>
43                                  </div>
44                              </div>
45                          </div>
46                          <div class="form-group">
47                              <label for="age" class="col-sm-2 control-label">学生年龄
    </label>
48                              <div class="col-sm-10">
49                                  <input type="text" name="age" class="form-control"
    id="age">
50                              </div>
51                          </div>
```

```
52                              <div class="form-group">
53                                  <label for="addr" class="col-sm-2 control-label">住址
    </label>
54                                      <div class="col-sm-10">
55                                          <input type="text" name="addr" class="form-control"
    id="addr">
56                                      </div>
57                              </div>
58                              <div class="form-group">
59                                  <label for="birth" class="col-sm-2 control-label">出生日期
    </label>
60                                      <div class="col-sm-10">
61                                          <input type="text" name="birth" class="form-control"
    id="birth">
62                                      </div>
63                              </div>
64                              <div class="form-group">
65                                  <label for="cid" class="col-sm-2 control-label">所在班级
    </label>
66                                      <div class="col-sm-10">
67                                          <select name="classes.cid" class="form-control">
68                                              <c:forEach items="${classes }" var="c">
69                                                  <option value="${c.cid }">${c.cname }
    </option>
70                                              </c:forEach>
71                                          </select>
72                                      </div>
73                              </div>
74                              <div class="form-group">
75                                  <input type="submit" value="添加" class="btn btn-primary
    col-md-offset-1 col-md-4 ">
76                                      <input type="reset" value="清空" class="btn btn-primary
    col-md-offset-1 col-md-4">
77                                  </div>
78                          </form>
79                  </div>
80
81          </div>
82      </div>
83  </div>
84  </body>
85  </html>
```

2.1.5)后台StudentController.java控制器方法(处理器)

```
1  package com.zelin.web.controller;
2
3  import com.zelin.pojo.Student;
4  import com.zelin.service.ClassesService;
5  import com.zelin.service.StudentService;
6  import org.springframework.beans.factory.annotation.Autowired;
7  import org.springframework.stereotype.Controller;
```

```java
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.RequestMapping;

import java.util.List;
import java.util.Map;

@Controller
@RequestMapping("/student")
public class StudentController {
    @Autowired
    private StudentService studentService;
    @Autowired
    private ClassesService classesService;

    //列表所有学生
    @RequestMapping("/list")
    public String findAll(Map map){
        map.put("students",studentService.findAll());
        map.put("classes", classesService.findAll());
        return "/student/list";
    }
    //到添加学生
    @RequestMapping("/toadd")
    public String toadd(Map map){
        map.put("classes",classesService.findAll());
        return "/student/add";
    }
    //添加学生
    @RequestMapping("/add")
    public String add(Student student){
        System.out.println(student);
        studentService.add(student);
        //redirect:代表重定向跳转，默认是转发
        return "redirect:/student/list.action";
    }
}
```

2.2)批量修改学生信息

2.2.1)定义StudentVo.java实体类

```java
/*****************************
 * 公司： 深圳市泽林信息公司          <br>
 * 作者： 王峰                      <br>
 * 类名： StudentVo           <br>
 * 日期： 2018年11月13日           <br>
 * 功能： 批量删除修改的数据类
 *****************************/
public class StudentVo {

    private String[] ids;
    private List<Student> students;
```

```java
12      public String[] getIds() {
13          return ids;
14      }
15      public void setIds(String[] ids) {
16          this.ids = ids;
17      }
18      public List<Student> getStudents() {
19          return students;
20      }
21      public void setStudents(List<Student> students) {
22          this.students = students;
23      }
24      @Override
25      public String toString() {
26          return "StudentVo [ids=" + Arrays.toString(ids) + ", students=" + students +
    "]";
27      }
28  }
```

2.2.2)定义/WEB-INF/jsp/student/list.jsp页面

```jsp
1   <%@ page language="java" contentType="text/html; charset=UTF-8"
2       pageEncoding="UTF-8"%>
3   <%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
4   <%@ taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt"%>
5   <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
    "http://www.w3.org/TR/html4/loose.dtd">
6   <html>
7   <head>
8   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
9   <title>Insert title here</title>
10  <!-- 引入bs库 -->
11  <%@ include file="/bs.jsp" %>
12
13  <style type="text/css">
14      .container{
15          margin-top:20px;
16      }
17      .table td{
18          text-align:center;
19      }
20      .panel-footer{
21          text-align:right;
22      }
23  </style>
24  </head>
25  <body>
26      <div class="container">
27          <div class="panel panel-primary">
28              <div class="panel-heading">
29                  <h4>学生管理系统</h4>
30              </div>
```

```jsp
            <form action="${base }/student/update.action" method="post" id='form1'>
            <table class="table table-hover">
                <tr>
                    <td>选择</td>
                    <td>学生姓名</td>
                    <td>学生性别</td>
                    <td>学生年龄</td>
                    <td>所在班级</td>
                    <td>家庭住址</td>
                    <td>出生日期</td>
                </tr>
                <c:forEach items="${students }" var="stud" varStatus="vs">
                    <input type="hidden" name="students[${vs.index}].sid" value="${stud.sid }">
                    <tr>
                        <td><input type="checkbox" name="ids" value="${stud.sid }"></td>
                        <td><input name="students[${vs.index}].sname" value="${stud.sname }"></td>
                        <td>
                            <input type="radio" name="students[${vs.index}].sex" value="男" ${stud.sex=='男'?'checked':'' }>男
                            <input type="radio" name="students[${vs.index}].sex" value="女" ${stud.sex=='女'?'checked':'' }>女

                        </td>
                        <td><input name="students[${vs.index}].age" value="${stud.age }"></td>
                        <td>
                            <select name="students[${vs.index}].classes.cid">
                                <c:forEach items="${classes }" var="c">
                                    <option value="${c.cid }" ${c.cid==stud.cid?'selected':'' }>${c.cname }</option>
                                </c:forEach>
                            </select>
                        </td>
                        <td><input name="students[${vs.index}].addr" value="${stud.addr }"></td>
                        <td>
                            <!-- 对日期进行格式化处理 -->
                            <input name="students[${vs.index }].birth"
                            value='<fmt:formatDate value="${stud.birth}" pattern="yyyy-MM-dd"/>'>
                        </td>
                    </tr>
                </c:forEach>
            </table>
            </form>
            <div class="panel-footer">
                <a href="${base}/student/toadd.action" class="btn btn-warning glyphicon glyphicon-plus">添加学生</a>


                <a href="javascript:updateStudent()" class="btn btn-info glyphicon
```

```
         glyphicon-pencil">批量修改学生</a>
73                       <a href="javascript:deleteStudent()" class="btn btn-danger glyphicon
         glyphicon-remove">批量删除学生</a>
74               </div>
75          </div>
76       </div>
77   </body>
78   <script>
79       //修改学生
80       function updateStudent(){
81           document.forms[0].submit();
82       }
83       //删除学生
84       function deleteStudent(){
85           //1.取得所选择的jquery元素
86           var checkboxes = $("input[name=ids]:checked");
87           //2.拼凑要删除学生的主键sid的字符串
88           var ids = "";
89           $.each(checkboxes,function(i,v){
90               //去掉最后一个逗号的方法一：
91               /* if(i == checkboxes.length-1){
92                   ids += $(v).val()
93               }else{
94                   ids += $(v).val()+","
95               } */

97               ids += $(v).val()+",";
98           })
99           //去掉最后一个逗号的方法二：
100          ids = ids.substr(0,ids.length-1);
101          location.href="${base}/student/delete.action?ids="+ids;
102      }
103  </script>
104  </html>
```

2.2.3)后台studentController.java中的update方法

```
1    //修改学生
2        @RequestMapping("/update")
3        public String update(StudentVo studentVo){
4            //1.在studentVo.getStudents()这个集合中根据studentVo.getIds()查询将要修改的学生
5            for(Student student : studentVo.getStudents()){
6                for(String id : studentVo.getIds()){
7                    if(Integer.valueOf(id).intValue() == student.getSid().intValue()){
8                        studentService.update(student);
9                    }
10               }
11           }
12           return "redirect:/student/list.action";
13       }
```

2.2.4) 运行效果如下：

学生管理系统						
选择	学生姓名	学生性别	学生年龄	所在班级	家庭住址	出生日期
☐	张小三	⦿男 ○女	25	1302班 ▼	广州123	2018-09-06
☐	王小五	⦿男 ○女	28	1301班 ▼	广州	2010-10-27
☐	李小红	○男 ⦿女	190	1302班 ▼	杭州	2008-08-21
☐	王二小	⦿男 ○女	12	1302班 ▼	岳阳	2010-02-16
☐	张小二	⦿男 ○女	28	1303班 ▼	上海123	2018-10-30
☐	黄家驹	⦿男 ○女	54	1303班 ▼	香港	1995-03-12
☐	罗成	⦿男 ○女	22	1301班 ▼	邵阳	1997-01-18
☐	魏征	⦿男 ○女	28	1301班 ▼	洛ab阳	2000-03-16
☐	徐达	⦿男 ○女	29	1302班 ▼	江苏无锡	2010-02-23
☐	孙宾	⦿男 ○女	35	1302班 ▼	上海浦东	1987-06-23
☐	赵本山	⦿男 ○女	65	1301班 ▼	东北大街	1954-11-17
☐	宋小宝	⦿男 ○女	54	1302班 ▼	东北	1963-07-18
☐	常遇春	⦿男 ○女	100	1301班 ▼	河南	1918-08-28
☐	常遇春	⦿男 ○女	100	1301班 ▼	河南	1918-08-28
☐	胡大海	⦿男 ○女	110	1302班 ▼	山东	1908-02-28
☐	刘伯温	⦿男 ○女	120	1301班 ▼	山东	1888-08-30
☐	汤和	⦿男 ○女	200	1302班 ▼	深圳	2018-09-03
☐	余小明	⦿男 ○女	20	1301班 ▼	上海	2000-01-01
☐	余明	⦿男 ○女	20	1301班 ▼	上海	2000-01-01

2.3)批量删除学生信息

2.3.1）修改/WEB-INF/jsp/student/list.jsp文件：

```
1   //删除学生
2       function deleteStudent(){
3           //修改表单的action的值
4           document.forms[0].action="${base}/student/delete.action";
5           document.forms[0].submit();
6       }
```

2.3.2）添加studentController.java中的delete方法:

```
1   //批量删除学生
2       @RequestMapping("/delete")
3       public String delete(StudentVo studentVo){
4           for(String id : studentVo.getIds()){
5               studentService.delete(id);
6           }
7           return "redirect:/student/list.action";
8       }
```

3、 Spring文件上传、下载

3.1）配置resource/spring/applicationContext-mvc.xml

```
1  <!--配置文件上传-->
2      <bean id="multipartResolver"
   class="org.springframework.web.multipart.commons.CommonsMultipartResolver">
3          <!--配置上传的字符编码为UTF-8-->
4          <property name="defaultEncoding" value="UTF-8"/>
5          <!--配置上传的最大的文件大小（以字节为单位）-->
6          <property name="maxUploadSize" value="10485760"/>
7
8      </bean>
```

3.2）/web/upload.jsp文件定义

```
1  <%@ page language="java" contentType="text/html; charset=UTF-8"
2      pageEncoding="UTF-8"%>
3  <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
   "http://www.w3.org/TR/html4/loose.dtd">
4  <html>
5  <head>
6  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
7  <title>文件上传页面</title>
8  <%@include file="/bs.jsp" %>
9  <style>
10     .panel-footer{
11         text-align:right;
12     }
13 </style>
14 </head>
15 <body>
16     <div class="container">
17         <div class="panel panel-primary">
18             <div class="panel-heading">
19                 <h4>文件上传演示</h4>
20             </div>
21             <div class="panel-body">
22                 <!-- 文件上传表单属性的定义 -->
23                 <form method="post" enctype="multipart/form-data"
24                     class="form-inline" action="${base
   }/fileUploadDownload/upload.action">
25                     <div class="form-group">
26                         <label>请输入上传的文件：</label>
27                         <input type="file" name="mFile" class="form-control">
28                         <input type="submit" class="btn btn-danger" value="上传">
29                     </div>
30
31                 </form>
32             </div>
33             <div class="panel-footer">
```

```
34                        泽林信息版权所有.
35                    </div>
36                </div>
37            </div>
38    </body>
39    </html>
```

3.3) /web/WEB-INF/jsp/file/list.jsp

```
1    <%@page import="java.io.File"%>
2    <%@ page language="java" contentType="text/html; charset=UTF-8"
3        pageEncoding="UTF-8"%>
4    <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
     "http://www.w3.org/TR/html4/loose.dtd">
5    <html>
6    <head>
7    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
8    <%@include file="/bs.jsp" %>
9    <style>
10       .panel-footer{
11           text-align:right;
12       }
13   </style>
14   </head>
15   <body>
16       <div class="container">
17           <div class="panel panel-primary">
18               <div class="panel-heading">
19                   <h4>文件列表</h4>
20               </div>
21               <div class="panel-body">
22                   <%
23                       //1.得到上传后的文件路径
24                       String path = application.getRealPath("/WEB-INF/upload");
25                       out.println(path);
26                       //2.根据路径构建文件对象
27                       File dirs = new File(path);
28                       //3.遍历上述的目录中的内容
29                       File[] files = dirs.listFiles();
30                       if(files != null)
31                       for(File file : files){
32                   %>
33                       <a href="${base }/fileUploadDownload/download.action?fileName=
     <%=file.getName() %>">
34                       <%=file.getName() %></a><hr>
35                   <%
36                       }
37
38                   %>
39               </div>
40               <div class="panel-footer">
41                   泽林信息版权所有.
```

```
42              </div>
43          </div>
44      </div>
45  </body>
46  </html>
```

3.4）后台控制器处理：

```java
1   @Controller
2   @RequestMapping("/fileUploadDownload")
3   public class FileUploadDownload {
4
5       //文件上传
6       @RequestMapping("/upload")
7       public String upload(MultipartFile mFile, HttpServletRequest request){
8           //1.得到服务器目录/upload的完整的绝对路径
9           String realPath = request.getServletContext().getRealPath("/WEB-INF/upload");
10          //2.得到当前正在上传的文件名
11          String fileName = mFile.getOriginalFilename();
12          //3.得到文件的后缀名
13          String suffixName = fileName.substring(fileName.lastIndexOf("."));
14          //4.随机生成的UUID的32位数字
15          String prefix = UUID.randomUUID().toString().replace("-", "");
16          try {
17              File dir = new File(realPath + File.separator);
18              if(!dir.exists()){
19                  dir.mkdir();
20              }
21              File file = new File(dir, prefix + suffixName);
22              //文件上传
23              mFile.transferTo(file);
24          } catch (IOException e) {
25              e.printStackTrace();
26          }
27          return "file/list";
28      }
29      @RequestMapping("/download")
30      public ResponseEntity<byte[]> download(String fileName, HttpServletRequest
    request){
31          //1.得到upload文件夹的完整的物理路径
32          String path = request.getServletContext().getRealPath("/WEB-INF/upload");
33          //2.构造要下载的文件
34          //2.1)如果考虑中文则要对文件名进行转码
35          //String filename = new String(fileName.getBytes("UTF-8"),"ISO-8859-1");
36          String fullName = path + File.separator + fileName;
37          File file = new File(fullName);
38          //1.定义请求头
39          HttpHeaders headers = new HttpHeaders();
40          headers.setContentDispositionFormData("attachment",fileName);
41          //设置文件内容类型  是二进制
42          headers.setContentType(MediaType.APPLICATION_OCTET_STREAM);
43          //2.得到要下载的文件的二进制数据
```
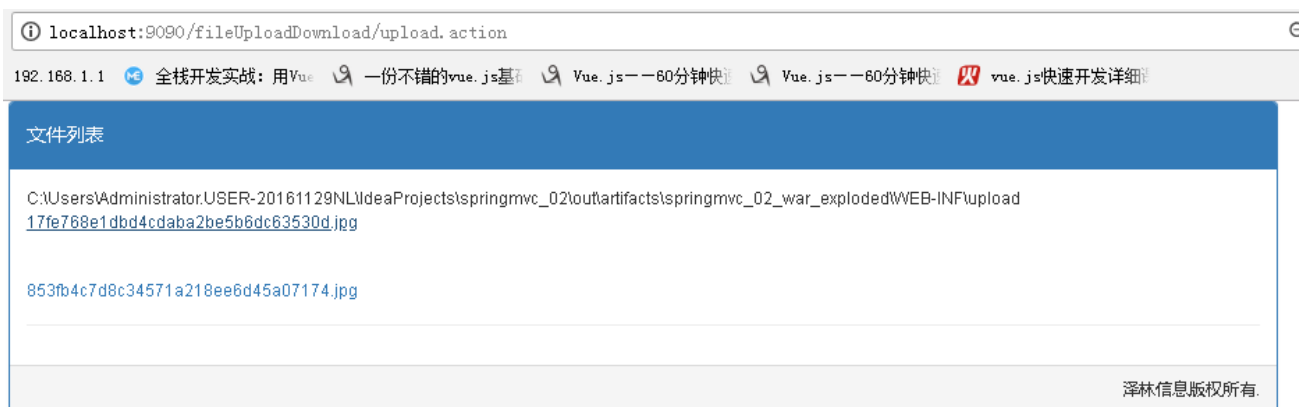
```
44          try {
45              byte[] bytes = FileUtils.readFileToByteArray(file);
46              return new ResponseEntity<byte[]>(bytes,headers, HttpStatus.CREATED);
47          } catch (IOException e) {
48              e.printStackTrace();
49          }
50          return null;
51
52      }
53  }
54
```

3.5）运行效果如下：

4、 Spring-Ajax异步处理

4.1）方法一：使用fastjson完成ajax异步操作：

4.1.1）添加fastjson.jar包

4.1.2）修改resource/spring/applicationContext-mvc.xml配置文件：

```xml
1  <!--2.使得注解的方式添加处理器映射器及处理器适配器-->
2      <mvc:annotation-driven conversion-service="conversionService">
3          <mvc:message-converters>
4              <bean
   class="com.alibaba.fastjson.support.spring.FastJsonHttpMessageConverter">
5                  <!--配置常用的媒体类型-->
6                  <property name="supportedMediaTypes">
7                      <list>
8                          <value>text/html;charset=utf-8</value>
9                          <value>application/json</value>
10                     </list>
11                 </property>
12                 <!--配置常用功能-->
13                 <property name="features">
14                     <list>
15                         <value>WriteMapNullValue</value>
16                         <value>QuoteFieldNames</value>
```

```
17                </list>
18            </property>
19        </bean>
20    </mvc:message-converters>
21  </mvc:annotation-driven>
22
```

4.1.3）添加web/list.html页面：（展示所有的班级）

```
1  <!DOCTYPE html>
2  <html>
3  <head>
4  <meta charset="UTF-8">
5  <title>列表班级</title>
6   <link rel="stylesheet" href="bootstrap-3.3.7/css/bootstrap.min.css">
7   <script src="bootstrap-3.3.7/js/jquery.min.js"></script>
8   <script src="bootstrap-3.3.7/js/bootstrap.min.js"></script>
9   <script src="bootstrap-3.3.7/js/docs.min.js"></script>
10     <style>
11         .table{
12             text-align: center;
13         }
14     </style>
15  </head>
16  <body>
17      <div class="container">
18          <div class="panel panel-primary">
19              <div class="panel-heading">
20                  <h4>班级列表信息</h4>
21              </div>
22              <div class="panel-body">
23                  <table class="table table-hover">
24                      <thead>
25                          <tr>
26                              <td>班级编号</td>
27                              <td>班级名称</td>
28                          </tr>
29                      </thead>
30                      <tbody></tbody>
31                  </table>
32              </div>
33          </div>
34      </div>
35  <script>
36      $(function(){
37          $.ajax({
38              url:'classes/list.action',
39              type:'post',
40              dataType:'json',
41              success:function(data){
42                  var info = "";
43                  $.each(data,function(i,v){
```

```
44              info += "<tr>";
45              info += "<td>" + v.cid + "</td>";
46              info += "<td>" + v.cname + "</td>";
47              info += "</tr>";
48          })
49          $('.table tbody').html(info);
50       }
51     })
52   })
53 </script>
54 </body>
55 </html>
```

4.1.4）添加ClassesController.java后台控制器：

```
1  @Controller
2  @RequestMapping("/classes")
3  public class ClassesController {
4      @Autowired
5      private ClassesService classesService;
6      @RequestMapping("/list")
7
8      //@ResponseBody：就是将java对象转换为json字符串返回给前端
9      @ResponseBody
10     public List<Classes> findAll(){
11         return classesService.findAll();
12     }
13 }
```

4.1.5）最终页面效果：

班级列表信息	
班级编号	班级名称
1	1301班
2	1302班
3	1303班
4	1304