



Java Server Page

JSP程序设计(上)

isszym sysu.edu.cn

2019.5.15

目录

- 概述
- Servlet程序
- JSP Web服务器
- JSP工作原理
- 第一个JSP程序
- 声明
- 如何获取提交的数据
 - 提交给另一个网页
 - 提交给自己
 - 提交给自己并保持输入
- 取到所有提交的名值对
- 获得http请求的头部内容
- 如何操作数据库
- 附录1、hello_jsp.java程序
- 附录2、JSP声明的源码转换

概述

- 什么是**JSP**

JSP(Java Server Pages)是由Sun Microsystems公司开发的一种实现普通静态HTML和动态HTML混合编码的技术。

- Servlet和JSP

Servlet是最早开始使用Java Web编程方式。Servlet编程通过扩展预定义的HttpServlet类响应HTTP的Get和Post请求。JSP建立在Servlet类的基础上。它分离了表现逻辑和业务逻辑。

[JSP教程](#)

Servlet程序

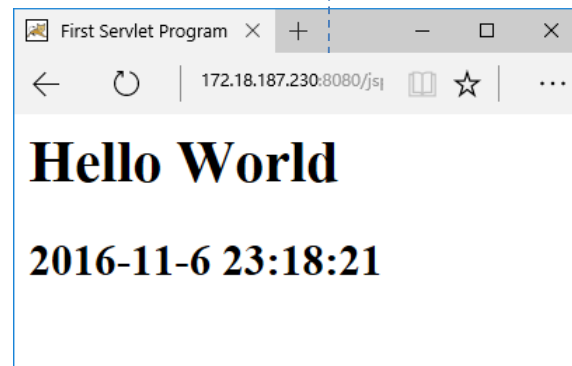
下面的Servlet程序(Hello.java)继承了系统的HttpServlet类。

<http://172.18.187.230:8080/jsp/servlet/Hello>

```
package com.group.servlet;
import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.servlet.http.*;

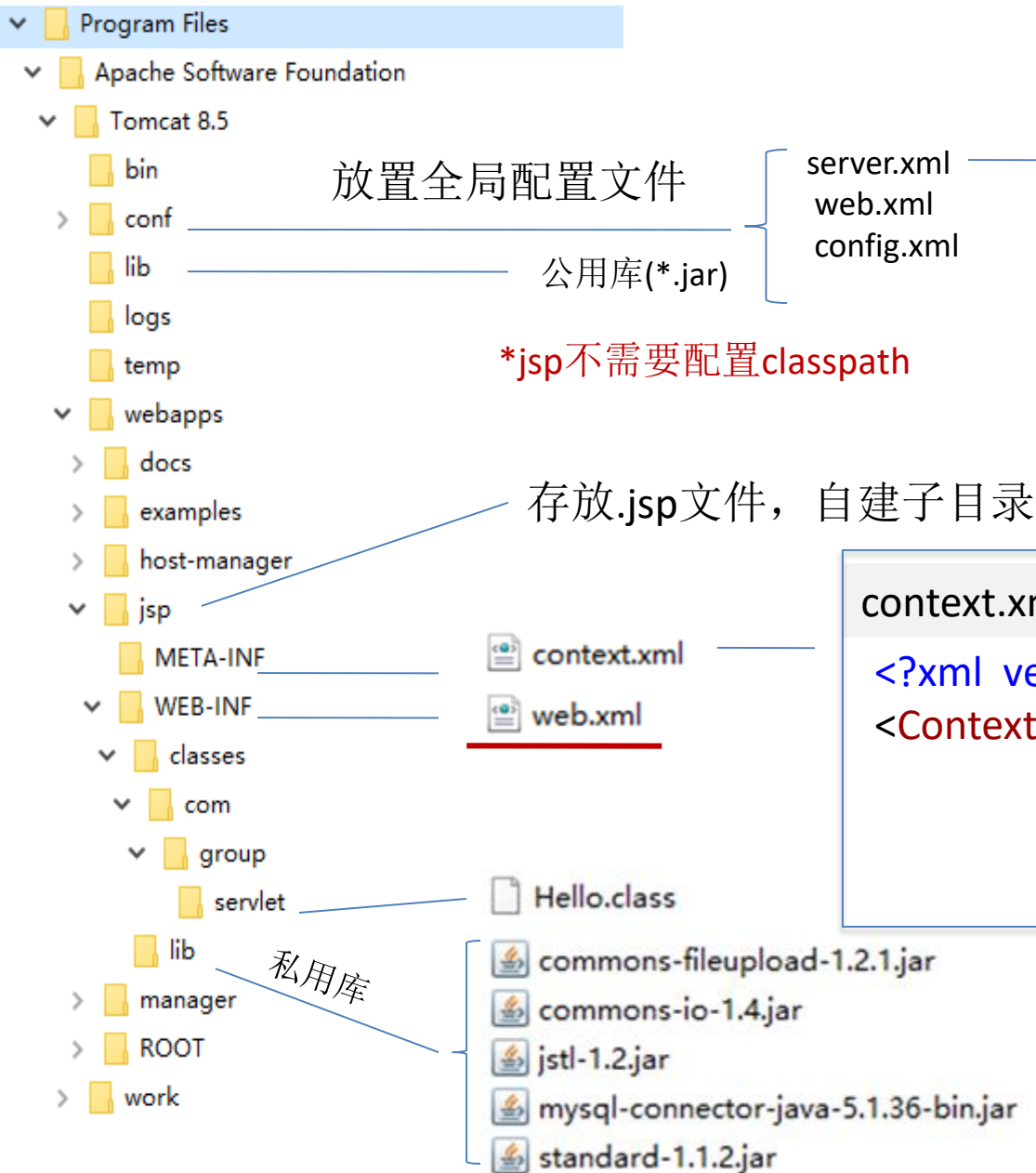
public class Hello extends HttpServlet {
    @SuppressWarnings("deprecation")
    @Override
    public void doGet(HttpServletRequest req, HttpServletResponse resp)
        throws ServletException, IOException {
        resp.setContentType("text/html");
        PrintWriter out = resp.getWriter();
        out.println("<html><head><title>First Servlet Program</title></head>");
        out.println("<body>");
        out.println("<h1>Hello World<h1>");
        out.println("<h2>" + new Date().toLocaleString() + "</h2>");
        out.println("</body>");
        out.println("</html>");
        out.flush();
    }
}

doPost
```



C:\java>javac -classpath .\servlet-api.jar Hello.java
* servlet-api.jar在tomcat的lib目录中

http://172.18.187.10:8080/jsp/servlet/Hello



webapps下的子目录都是虚拟目录。要定义其它虚拟目录，需要修改配置文件server.xml。

context.xml文件内容:

```
<?xml version="1.0"?>
<Context reloadable="true"/>
```

*修改后自动重载，不需要重启Tomcat服务器

<http://172.18.187.10:8080/jsp/servlet/Hello>

web.xml (在webapps\jsp\WEB-INF目录下)

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

```
<web-app>
```

```
  <description>Servlet and JSP Examples. </description>
```

```
  <display-name>Servlet and JSP Examples</display-name>
```

```
  <servlet> (3)
```

```
    <servlet-name>HelloWorld</servlet-name>
```

```
    <servlet-class>com.group.servlet.Hello</servlet-class>
```

```
  </servlet> (4)
```

```
  <servlet-mapping> (2)
```

```
    <servlet-name>HelloWorld</servlet-name>
```

```
    <url-pattern>/servlet/Hello</url-pattern>
```

```
  </servlet-mapping> (1) URL
```

```
  <servlet>
```

```
    <servlet-name>Requ</servlet-name>
```

```
    <servlet-class>serv.RequestInfo</servlet-class>
```

```
  </servlet>
```

```
  <servlet-mapping>
```

```
    <servlet-name>Requ</servlet-name>
```

```
    <url-pattern>/servlet/request</url-pattern>
```

```
  </servlet-mapping>
```

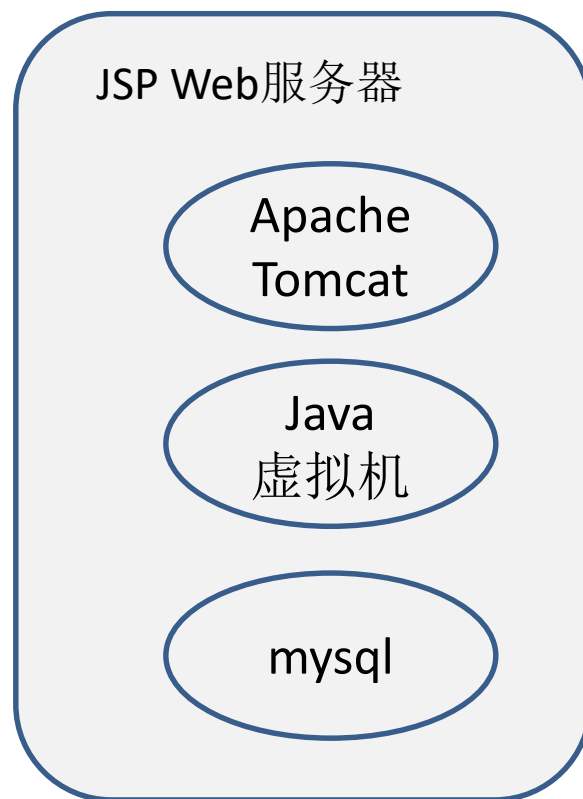
```
</web-app>
```

一个servlet

另一个servlet

JSP Web服务器

Web服务器是接收HTTP请求并返回HTTP响应的软件。下面是一种JSP web服务器结构，Apache Tomcat为Web服务器，它是基于Java虚拟机的。这个结构采用了MySQL数据库。如果编程使用Eclipse，注意其内部Tomcat与外部的Tomcat可能会冲突（只能启动一个）。

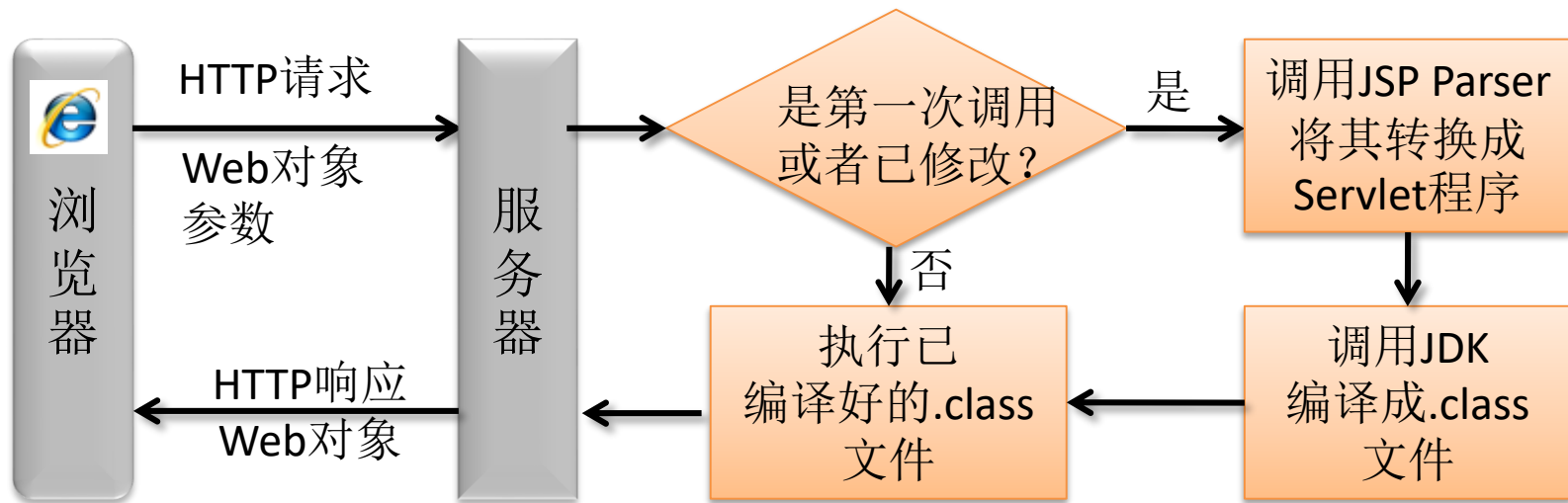


[tomcat下载](#)

[java下载](#)

[mysql下载](#)

JSP工作原理



- (1) 当Web服务器收到对JSP文件(JSP页面)的HTTP请求，如果所请求的JSP文件是修改后的第一次访问，则调用JSP Parser将其转换成Servlet程序（.java），然后调用JSDK编译成Servlet字节码（.class）。
- (2) Java虚拟机执行Servlet字节码发回HTTP响应。
- (3) 如果有多个HTTP请求发给同一个JSP文件，则Tomcat服务器会为每一个请求启动一个线程执行该文件对应的Servlet字节码。

第一个JSP程序

hello.jsp

指令元素

HTML模板

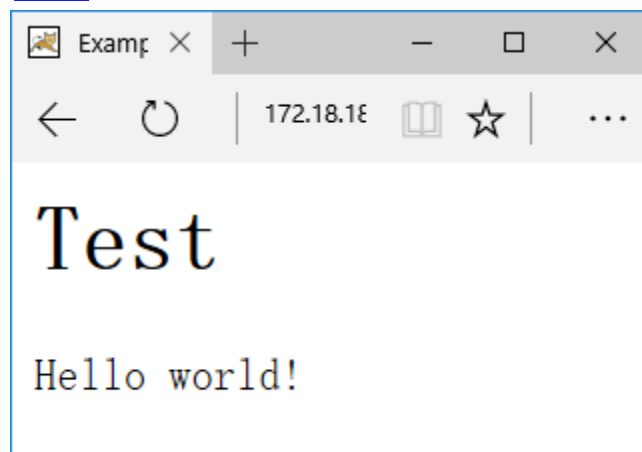
脚本片段
(scriptlet)

HTML模板

生成http响应的指示, 例如, 要使用的包, http响应的头部content-type.

```
<%@ page contentType="text/html; charset=gb2312"%>
<html>
<head>
<title>Example</title>
</head>
<body>
<h1> Test </h1>
<p>
<%
    out.print("Hello world!");
%>
</p>
</body>
</html>
```

网址



Java程序放在<% %>之间。out为一个JSP的系统对象。

如果只输出一个表达式而不是语句, 可以采用<%=exp%>输出, 例如: <%= "Hello World!" %>。

hello.jsp会被自动转换为servlet程序hello_jsp.java，放在work子目录下，然后再编译成字节码文件hello_jsp.class，并在Java虚拟机上运行，最后把运行的输出结果用http响应传送到客户端。

```
public final class hello_jsp extends
    org.apache.jasper.runtime.HttpJspBase{
    ...可以在这里声明<%! %>内定义全局变量、函数和类
    public void _jspService(... request,... response)
        定义了jsp内置对象: out、session、application、config
        ...
        out.write("<html>\r\n");
        out.write("<head>\r\n");
        out.write("<title>Hello world</title>\r\n");
        out.write("</head>\r\n");
        out.write("<body>\r\n");
        out.write("<h1>Test</h1>\r\n");
        out.write("<p>\r\n");
        out.print("Hello world!");
        out.write("</p>\r\n");
        out.write("</body>\r\n");
        out.write("</html>\r\n");
        out.write("\r\n");
        ...
    }
}
```

- * out.print()只能输出字符，而out.write还可以输出字节流
- * hello_jsp.java的详细内容见附录

为什么for语句里面可以加入html的语句？ 如何解释？

hellofor.jsp

```
<%@ page contentType="text/html; charset=gb2312"%>
<html>
<head>
<title>Example</title>
</head>
<body>
<h1>Test</h1>
<%for(int i=0;i<10;i++){%>
    <p>Hello!<%=i%></p>
<%}%>
</body>
</html>
```



```
...
out.write("\r\n");
out.write("<html>\r\n");
out.write("<head>\r\n");
out.write("<title>Example</title>\r\n");
out.write("</head>\r\n");
out.write("<body>\r\n");
out.write("<h1>Test</h1>\r\n");
for(int i=0;i<10;i++){
    out.write("\r\n");
    out.write("<p>Hello!");
    out.print(i);
    out.write("</p>\r\n");
}
out.write("\r\n");
out.write("</body>\r\n");
out.write("</html>\r\n");
out.write("\r\n");
out.write("\r\n");
out.write("\r\n");
...
```

也可以这样编程，先计算出变量值，再把结果代入Web页面，实现Java代码与HTML代码分离：

hellofor2.jsp

```
<%@ page contentType="text/html; charset=gb2312"%>
<% String s="";
    for(int i=0;i<10;i++){
        s=s+"<p>Hello!" + i + "</p>";
    }
%>
<html>
<head>
<title>Example</title>
</head>
<body>
<h1>Test</h1>
<%=s%>
</body>
</html>
```

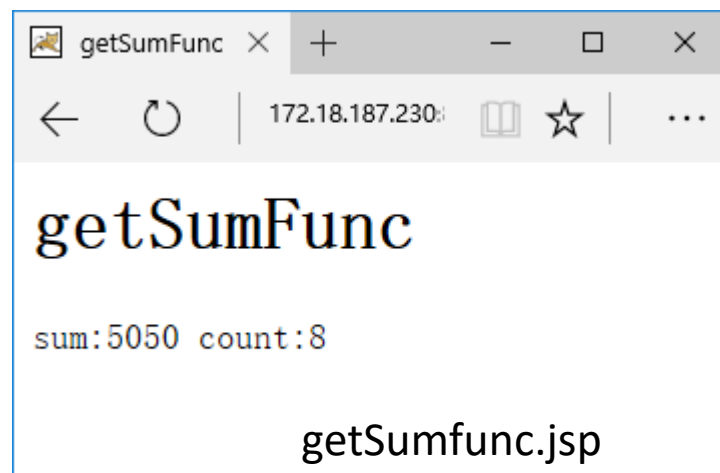
声明

JSP程序的函数和类只能在**声明**`<%! ... %>`中定义，它们会被分别转换为**servlet**类的方法和内部类。声明中定义的变量会被所有用户线程所共享。

```
<%@ page contentType="text/html; charset=gb2312"%>
```

```
<%! int cnt=0;
    int getSum(int n){
        int sum=0;
        for(int i=1;i<=n;i++){
            sum=sum+i;
        }
        return sum;
    }
%>
```

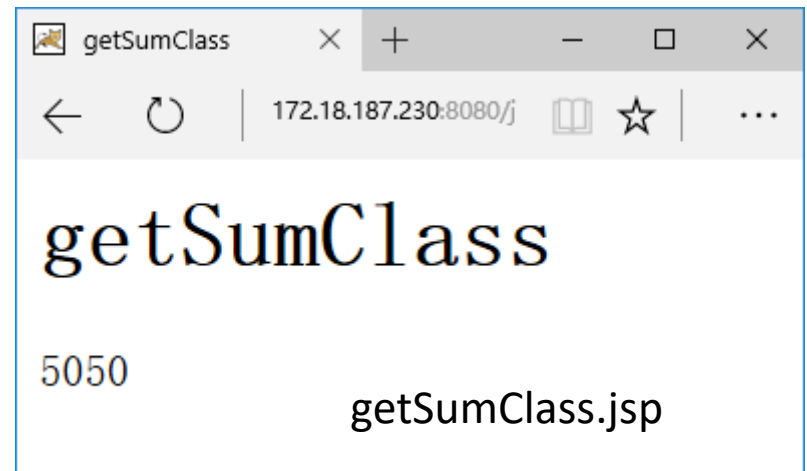
```
<html>
<head>
<title>getSumFunc</title>
</head>
<body>
    <h1>getSumFunc</h1>
    sum:<%=getSum(100)%>
    count:<%=cnt++%>
</body>
</html>
```



在声明中不能使用jsp内置对象，例如：**out**、**session**、**request**、**response**等。这些对象可以作为参数传入到声明中。这些对象的具体类型见附录的**servlet**程序。

getSumClass.jsp

```
<%@ page contentType="text/html; charset=gb2312"%>
<%! class Sum{
    int getSum(int n){
        int sum=0;
        for(int i=1;i<=n;i++){
            sum=sum+i;
        }
        return sum;
    }
}%>
<html>
<head>
<title>getSumClass</title>
</head>
<body>
    <h1>getSumClass</h1>
    <% Sum sum=new Sum();
        out.print(sum.getSum(100));
    %>
</body>
</html>
```



//Sum.java

```
package com.group.jsp;
public class Sum {
    public int getSum(int n){
        int sum=0;
        for(int i=1;i<=n;i++){
            sum=sum+i;
        }
        return sum;
    }
}
```

//getSumClass2.jsp

```
<%@ page import="com.group.jsp.Sum"
contentType="text/html;charset=gb2312"%>
<html>
<head>
<title>getSumClass</title>
</head>
<body>
    <h1>getSumClass</h1>
    <%
        Sum sum=new Sum();
        out.print(sum.getSum(100));
    %>
</body>
</html>
```

Sum.class文件放在

tomcat\webapps\jsp\WEB-INF\classes\
com\group\jsp目录下

- JSP的类一定要指定包名，不能用默认包
- 一个网页可以出现多个import:
 <%@ page import="a.b.*" %>
 <%@ page import="x.y.*" %>
- 可以合并，用逗号隔开:
 <%@ page import="a.b.*,x.y.*" %>

如何获取提交的数据

(1) 提交给另一个网页（必须是动态网页）

初始页面

A browser window titled 'postInput' showing a web form at '3080/jsp/postInput.jsp'. The form contains the following fields and controls:

- name:** A text input field containing 'David'.
- grade:** Radio buttons for 'freshman', 'sophomore', 'junior', and 'senior'.
- hobby:** Checkboxes for 'sports', 'travel', and 'music'.
- other:** A large text area containing 'abcdefg'.
- Buttons:** 'save' and 'exit' buttons at the bottom.

postInput.jsp

postInput.jsp

输入后页面

A browser window titled 'postInput' showing the same web form after data entry. The address bar shows '202.116.76.22:8080/jsp'. The form fields are updated as follows:

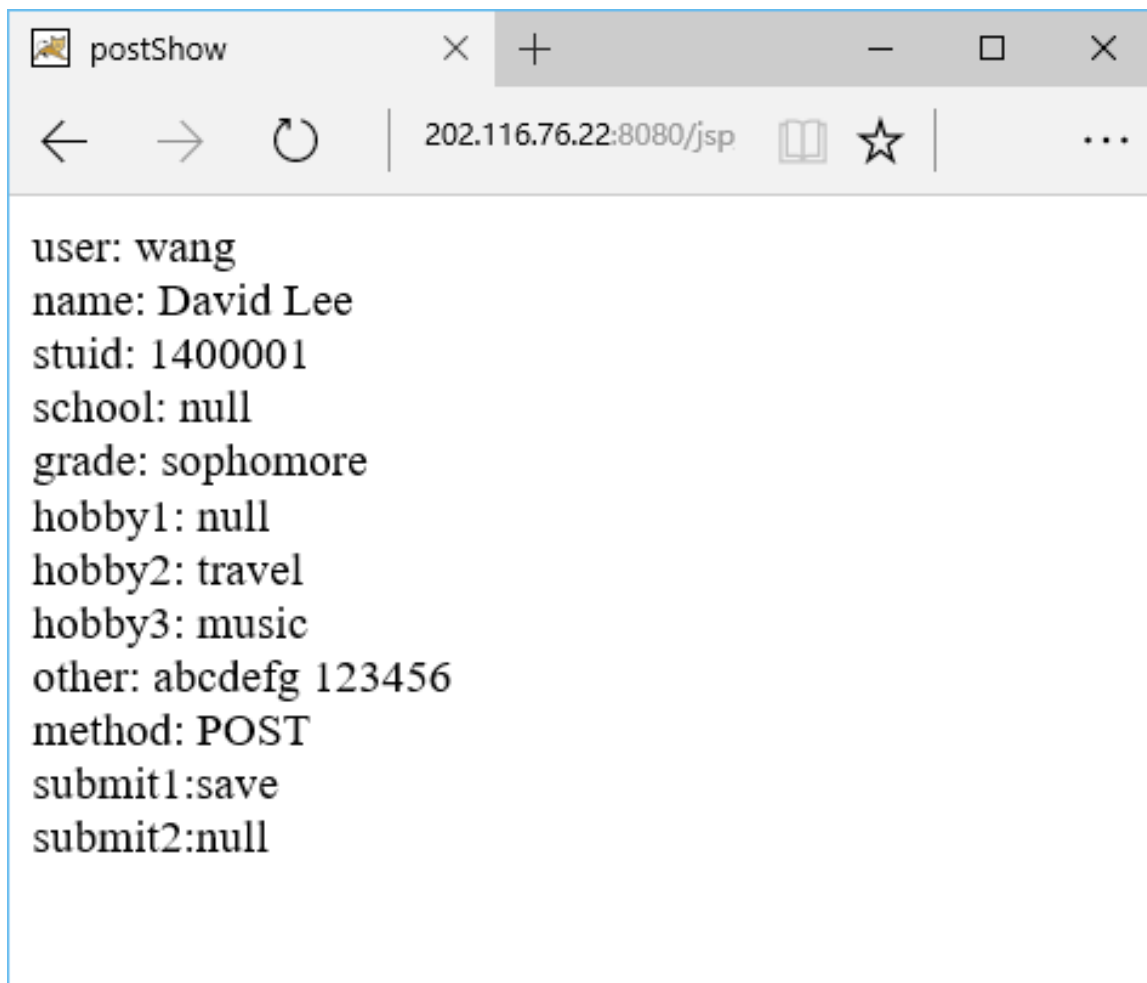
- name:** 'David Lee'.
- grade:** 'sophomore' is selected (radio button is filled).
- hobby:** 'travel' and 'music' are checked (checkboxes are filled).
- other:** The text area contains 'abcdefg 123456'.
- Buttons:** 'save' and 'exit' buttons are present.

点击 →

*disabled的数据不会被提交

点击后进入的页面:

postShow.jsp



postInput.jsp

```
<%@ page language="java" import="java.util.*"
    contentType="text/html; charset=utf-8" pageEncoding="utf-8"%>
<!DOCTYPE HTML>
<html>
    <head><title>postInput</title></head>
    <body>
        <form action="postShow.jsp?user=wang" method="post">
            <input type="hidden" name="stuid" value="1400001" />
            name: <input type="text" name="name" value="David"/>
            grade: freshman<input type="radio" name="grade" value="freshman"/>
                  sophomore<input type="radio" name="grade" value="sophomore"/>
                  junior<input type="radio" name="grade" value="junior"/>
                  senior<input type="radio" name="grade" value="senior"/>
            hobby: sports<input type="checkbox" name="hobby1" value="sports"/>
                  travel<input type="checkbox" name="hobby2" value="travel"/>
                  music<input type="checkbox" name="hobby3" value="music"/>
            other: <textarea rows="5" cols="30" name="other">abcdefg</textarea>
            <input type="submit" name="submit1" value="save" />
            <input type="submit" name="submit2" value="exit" />
        </form>
    </body>
</html>
```

* 提交时，只会提交被点击的submit类型的按钮，没被点击的submit类型的按钮不会被提交。


postShow.jsp

```
<%@ page language="java" import="java.util.*"
        contentType="text/html; charset=utf-8"%>
<%request.setCharacterEncoding("utf-8");%>
<!DOCTYPE HTML>
<html>
    <head> <title>postShow</title></head>
    <body>user:    <%= request.getParameter("user")%>
                name:    <%= request.getParameter("name")    %>
                stuid:    <%= request.getParameter("stuid")    %>
                school:    <%= request.getParameter("school")  %>
                grade:    <%= request.getParameter("grade")    %>
                hobby1:    <%= request.getParameter("hobby1")   %>
                hobby2:    <%= request.getParameter("hobby2")   %>
                hobby3:    <%= request.getParameter("hobby3")   %>
                other:    <%= request.getParameter("other")     %>
                method:    <%= request.getMethod()              %>
                submit1:    <%= request.getParameter("submit1") %>
                submit2:    <%= request.getParameter("submit2") %>
    </body>
</html>
```

- url中的参数也是通过getParameter取到的。
- 在所有键值对中找不到键(key)时getParameter取值null。
- setCharacterEncoding()用于指出收到的提交数据所用的编码（也是提交网页的编码）
- 只有被按的submit按钮才会被提交， 其它submit按钮不会被提交。


(2) 提交给自己并显示输入值

postInput.jsp 原来提交



```
<form action="postShow.jsp?user=wang" method="post">  
.....  
</form>
```

postToSelf.jsp 现在提交



```
<form action="postToSelf.jsp?user=wang" method="post">  
.....  
</form>
```

postToSelf.jsp

```
<%@ page language="java" import="java.util.*" contentType="text/html;
charset=utf-8"%>
<%request.setCharacterEncoding("utf-8");%>
<!DOCTYPE HTML> <html> <head> <title>提交给自己</title> </head>
<body>
    <%if (!request.getMethod().equalsIgnoreCase("post")){ %>
        <form action="postToSelf.jsp?user=wang" method="post">
            <input type="hidden" name="stuid">
            name: <input type="text" name="name">
            grade: freshman<input type="radio" name="grade" value="freshman">
                    sophomore<input type="radio" name="grade" value="sophomore">
                    junior<input type="radio" name="grade" value="junior">
                    senior<input type="radio" name="grade" value="senior">
            hobby: sports<input type="checkbox" name="hobby" value="sports">
                    travel<input type="checkbox" name="hobby" value="travel">
                    music<input type="checkbox" name="hobby" value="music">
            other: <textarea rows="5" cols="30" name="other"></textarea>
            <input type="submit" name="submit1" value="save">
            <input type="submit" name="submit2" value="exit">
        </form>
    <%} %>
```

```

<%else{ %>
    user:<%= request.getParameter("user") %>
    name:<%= request.getParameter("name") %>
    stuid:<%= request.getParameter("stuid") %>
    school:<%= request.getParameter("school") %>
    grade: <%= request.getParameter("grade") %>
    hobby: <%= Arrays.toString(request.getParameterValues("hobby")) %>
    other: <%= request.getParameter("other") %> <br>
    method: <%= request.getMethod() %>
    submit1:<%= request.getParameter("submit1") %>
    submit2:<%= request.getParameter("submit2") %>
<%}%>

```

</body></html>

* request.getParameterValues("hobby")可以得到由多个选中值组成的字符串数组。



Initial form state (初始画面):

- name:
- grade: ☐ freshman ☐ sophomore ☐ junior ☐ senior
- hobby: ☐ sports ☐ travel ☐ music
- other:
- Buttons: save, exit

初始画面



Form state after input (输入后):

- name:
- grade: ☐ freshman ☐ sophomore ☒ junior ☐ senior
- hobby: ☒ sports ☐ travel ☒ music
- other:

↑ 点击
- Buttons: save, exit

输入后



Form state after submission (提交后):

```

user:wang
name:David Lee
stuid:
school:null
grade: sophomore
hobby: [sports, music]
other: Hello!
method: POST
submit1:save
submit2:null

```

提交后

(3) 提交给自己（不保持输入值）

postNoKeep.jsp

```
<%@ page language="java" import="java.util.*"
    contentType="text/html; charset=utf-8"%>
<!DOCTYPE HTML><html><head><title>提交给自己2</title></head><body>
  <form action="postNoKeep.jsp?user=wang" method="post">
    <input type="hidden" name="stuid" value="">
    name: <input type="text" name="name" value="">
    grade: freshman<input type="radio" name="grade" value="freshman">
           sophomore<input type="radio" name="grade" value="sophomore">
           junior<input type="radio" name="grade" value="junior">
           senior<input type="radio" name="grade" value="senior">
    hobby: sports<input type="checkbox" name="hobby" value="sports">
           travel<input type="checkbox" name="hobby" value="travel">
           music<input type="checkbox" name="hobby" value="music">
    other: <textarea rows="5" cols="30" name="other"></textarea>
    <input type="submit" name="submit1" value="save">
    <input type="submit" name="submit2" value="exit">
  </form>
</body></html>
```

一开始得到前面的初始画面，输入之后点击save按钮后会得到什么？

(4) 提交给自己并保持输入值

postAndKeep.jsp

```
<%@ page language="java" import="java.util.*"
        contentType="text/html; charset=utf-8"%>
<%request.setCharacterEncoding("utf-8");
    String user="wang";
    String name="";
    String stuid="";
    String school="";
    String grade="";
    String hobby="";
    String other="";
    if (request.getMethod().equalsIgnoreCase("post")){
        user = request.getParameter("user");
        name = request.getParameter("name");
        stuid = request.getParameter("stuid");
        school = request.getParameter("school");
        grade = request.getParameter("grade");
        hobby = Arrays.toString(request.getParameterValues("hobby"));
        other = request.getParameter("other");
    }
%>
<!DOCTYPE HTML><html><head><title>提交给自己3</title></head><body>
```

```

<form action="postAndKeep.jsp?user=<%=user%>" method="post">
  <input type="hidden" name="stuid" value="<%=stuid%>">
  name: <input type="text" name="name" value="<%=name%>">
  grade: freshman<input type="radio" name="grade" value="freshman"
    <%=grade.equals("freshman")?"checked":""%> >
    sophomore<input type="radio" name="grade" value="sophomore"
    <%=grade.equals("sophomore")?"checked":""%> >
    junior<input type="radio" name="grade" value="junior"
    <%=grade.equals("junior")?"checked":""%> >
    senior<input type="radio" name="grade" value="senior"
    <%=grade.equals("senior")?"checked":""%> >
  hobby: sports<input type="checkbox" name="hobby" value="sports"
    <%=hobby.indexOf("sports")>=0?"checked":""%> >
    travel<input type="checkbox" name="hobby" value="travel"
    <%=hobby.indexOf("travel")>=0?"checked":""%> >
    music<input type="checkbox" name="hobby" value="music"
    <%=hobby.indexOf("music")>=0?"checked":""%> >
  other: <textarea rows="5" cols="30" name="other"><%=other%></textarea>
  <input type="submit" name="submit1" value="save">
  <input type="submit" name="submit2" value="exit">
</form>
</body>
</html>

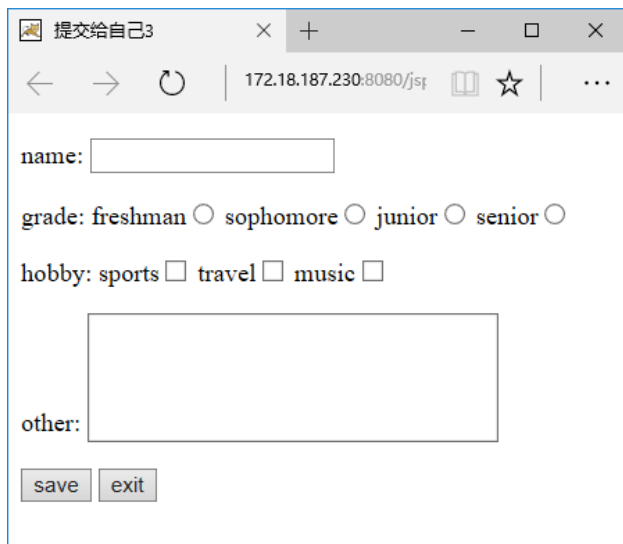
```

三元运算符的格式

[条件表达式] ? [表达式1] : [表达式2]

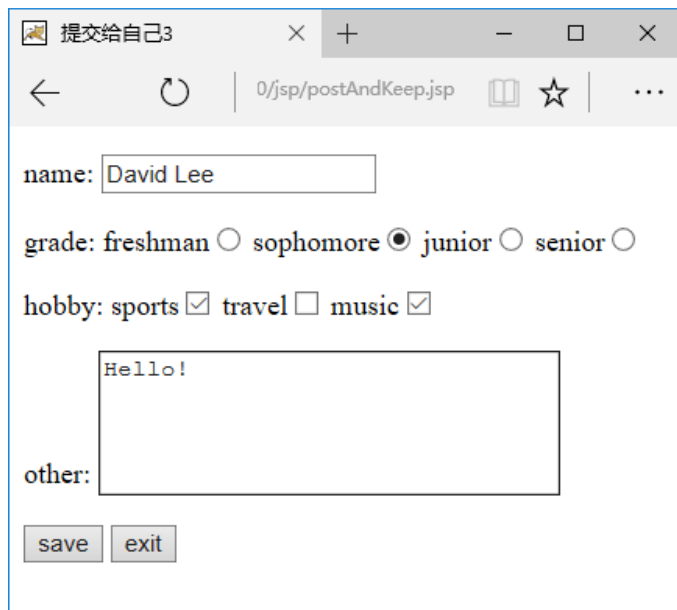
* [条件表达式]的值为真则返回[表达式1] 的值，否则，返回[表达式2]的值

(a) 初始画面



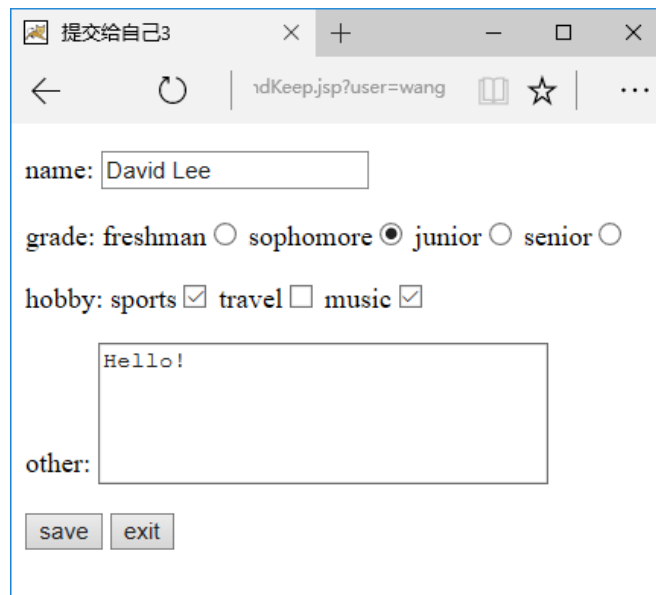
A browser window titled "提交给自己3" shows a web form. The address bar displays "172.18.187.230:8080/jsp/". The form contains a "name:" label followed by an empty text input field. Below it, "grade:" is followed by radio buttons for "freshman", "sophomore", "junior", and "senior". "hobby:" is followed by checkboxes for "sports", "travel", and "music". An "other:" label is followed by a large empty text area. At the bottom are "save" and "exit" buttons.

(b) 输入后画面



The browser window now shows the form with input. The address bar is "0/jsp/postAndKeep.jsp". The "name" field contains "David Lee". The "grade" radio buttons have "junior" selected. The "hobby" checkboxes have "sports" and "music" checked. The "other" text area contains "Hello!". The "save" and "exit" buttons remain at the bottom.

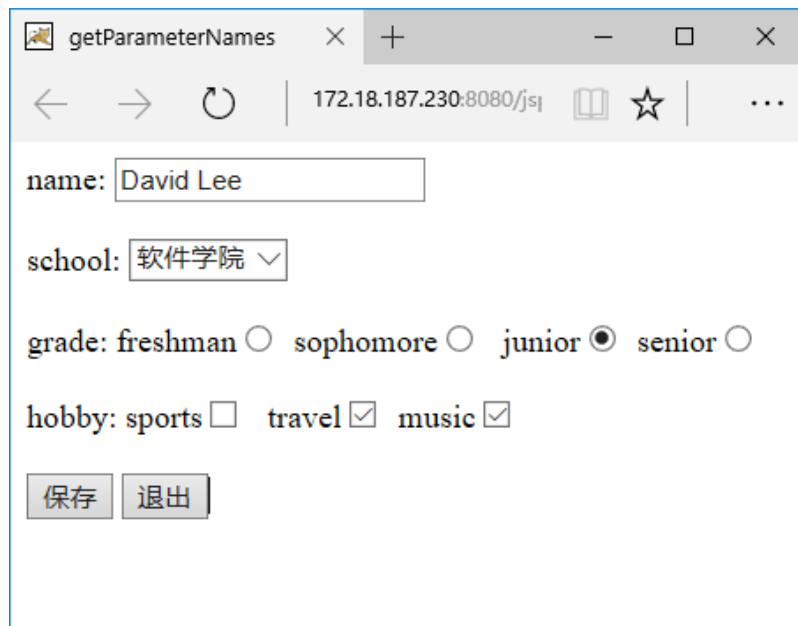
(c) 点击save后的画面



The browser window shows the form after a POST request. The address bar is "1dKeep.jsp?user=wang". The form content is identical to the previous state, with "David Lee" in the name field, "junior" selected for grade, "sports" and "music" checked for hobby, and "Hello!" in the other field. The "save" and "exit" buttons are still present.

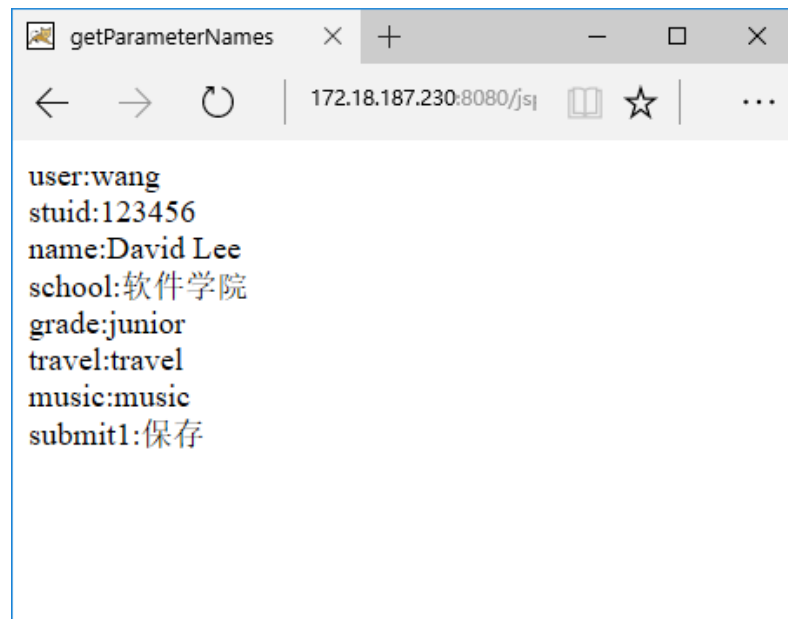
(5) 取到所有提交的名值对 [getParameterNames.jsp](#)

```
<%@ page language="java" import="java.util.*"
      contentType="text/html; charset=utf-8"%>
<% request.setCharacterEncoding("utf-8");%>
<% String saveButton=request.getParameter("submit1"); //判断是否按了保存按钮
    if(saveButton!=null){
        Enumeration<String> enums=request.getParameterNames();
        while(enums.hasMoreElements()){
            String name=(String)enums.nextElement();
            out.print(name+": "+request.getParameter(name)+"<br />");
        }
    }
%>
```



A screenshot of a web browser window titled 'getParameterNames'. The address bar shows '172.18.187.230:8080/jsj'. The form contains the following elements:

- A text input field labeled 'name:' with the value 'David Lee'.
- A dropdown menu labeled 'school:' with '软件学院' selected.
- Radio buttons for 'grade:' with 'freshman', 'sophomore', 'junior' (selected), and 'senior'.
- Checkboxes for 'hobby:' with 'sports' (unchecked), 'travel' (checked), and 'music' (checked).
- Two buttons at the bottom: '保存' (Save) and '退出' (Exit).

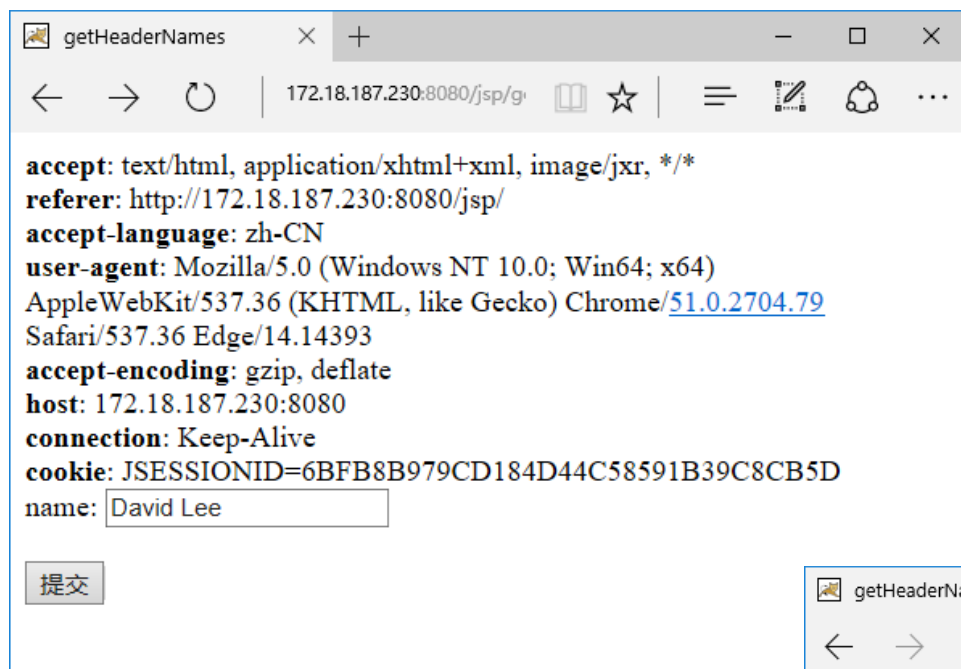


A screenshot of the same web browser window showing the output of the JSP page. The output is a list of key-value pairs:

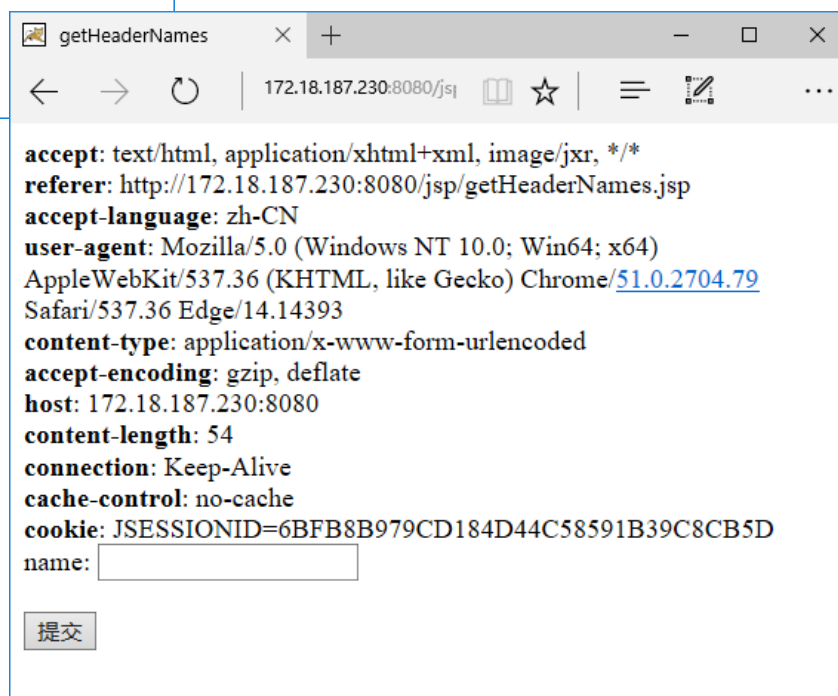
```
user:wang
stuid:123456
name:David Lee
school:软件学院
grade:junior
travel:travel
music:music
submit1:保存
```

(6) 获得http请求的头部内容 [getHeaderNames.jsp](#)

```
<%@ page language="java" import="java.util.*"
    contentType="text/html; charset=utf-8"%>
<%request.setCharacterEncoding("utf-8");%>
<% Enumeration<String> enums=request.getHeaderNames();
    while(enums.hasMoreElements()){
        String name=(String)enums.nextElement();
        out.println("<B>"+name+"</B>: "+request.getHeader(name)+"<br>");
    }
%>
<!DOCTYPE HTML>
<html>
    <head>
        <title>getHeaderNames</title>
    </head>
    <body>
        <form action="getHeaderNames.jsp" method="post">
            <input type="hidden" name="stuid" value="123456" />
            name: <input type="text" name="name" value=""/>
            <input type="submit" name="submit1" value="提交" />
        </form>
    </body>
</html>
```



点击提交按钮后得到



数据库操作

[browseStu1.jsp](#)

- 浏览学生记录(简单)

```
<%@ page language="java" import="java.util.*,java.sql.*"
    contentType="text/html; charset=utf-8"
%><% request.setCharacterEncoding("utf-8");
String msg="";    String table="";
String conStr = "jdbc:mysql://localhost:53306/teaching"
    + "?autoReconnect=true&useUnicode=true&characterEncoding=UTF-8";
try {
    Class.forName("com.mysql.jdbc.Driver"); // 查找数据库驱动类
    Connection con=DriverManager.getConnection(conStr, "user", "123");
    Statement stmt=con.createStatement(); // 创建MySQL语句的对象
    ResultSet rs=stmt.executeQuery("select * from stu");//执行查询，返回结果集
    if(rs.next()) { //把游标(cursor)移至第一个或下一个记录
        table=rs.getString("name"); //如果还有记录，则得到数据域name的值
    }
    rs.close(); stmt.close(); con.close();
}
catch (Exception e){
    msg = e.getMessage();
}
%>
```

- 数据库部分查看Java程序设计
- 这里只显示了第一个学生的名字，用一个循环语句就可以显示所有学生记录。

```
<!DOCTYPE HTML>
<html>
<head>
<title>浏览学生名单</title>
</head>
<body>
  <h1>浏览学生名单</h1>
  <%=table%><br><br>
</body>
</html>
```



- 翻页浏览学生记录

[browseStu2.jsp](#)

```
<%@ page language="java" import="java.util.*,java.sql.*"
    contentType="text/html; charset=utf-8"
%><% request.setCharacterEncoding("utf-8");
String msg = "";
Integer pgno = 0; //当前页号
Integer pgcnt = 4; //每页行数
String param = request.getParameter("pgno");
if(param != null && !param.isEmpty()){
    pgno = Integer.parseInt(param);
}
param = request.getParameter("pgcnt");
if(param != null && !param.isEmpty()){
    pgcnt = Integer.parseInt(param);
}
int pgprev = (pgno>0)?pgno-1:0;
int pgnext = pgno+1;
String connectString = "jdbc:mysql://localhost:53306/teaching"
    + "?autoReconnect=true&useUnicode=true&characterEncoding=UTF-8";
String user="user";
String pwd="123";
StringBuilder table = new StringBuilder();
```

```

try{
    Class.forName("com.mysql.jdbc.Driver");
    Connection con=DriverManager.getConnection(connectString, user, pwd);
    Statement stmt=con.createStatement();
    String sql=String.format("select * from stu limit %d,%d",
                                pgno*pgcnt,pgcnt);
    ResultSet rs=stmt.executeQuery(sql);
    table.append("<table><tr><th>id</th><th>学号</th><th>姓名</th>"+
                "<th>-</th></tr>");
    while(rs.next()) {
        table.append(String.format(
            "<tr><td>%s</td><td>%s</td><td>%s</td><td>%s %s</td></tr>",
            rs.getString("id"),rs.getString("num"),rs.getString("name"),
            "<a href='updateStu.jsp?pid="+rs.getString("id")+"'>修改</a>",
            "<a href='deleteStu.jsp?pid="+rs.getString("id")+"'>删除</a>"
        )
    );
    }
    table.append("</table>");
    rs.close();  stmt.close();  con.close();
}
catch (Exception e){
    msg = e.getMessage();
}
%>

```

```
<!DOCTYPE HTML>
<html>
  <head>
    <title>翻页浏览学生名单</title>
    <style>...  见下页</style>
  </head>
  <body>
    <div class="container">
      <h1>浏览学生名单</h1>
      <%=table%>
      <div style="float:left">
        <a href="addStu.jsp">新增</a>
      </div>
      <div style="float:right">
        <a href="browseStu2.jsp?pgno=<%=pgprev%>&pgcnt=<%=pgcnt%>">上一页</a>
        <a href="browseStu2.jsp?pgno=<%=pgnext%>&pgcnt=<%=pgcnt%>">下一页</a>
      </div>
      <br><br>
      <%=msg%><br><br>
    </div>
  </body>
</html>
```

```
<style>
  table{
    border-collapse: collapse;
    border: none;
    width: 500px;
  }
  td,th{
    border: solid grey 1px;
    margin: 0 0 0 0;
    padding: 5px 5px 5px 5px
  }
  a:link,a:visited {
    color:blue
  }

  .container{
    margin:0 auto;
    width:500px;
    text-align:center;
  }
</style>
```

浏览器窗口标题: 浏览学生名单

地址栏: 172.18.187.230:8080/jsp/browseStu2.jsp

浏览学生名单

id	学号	姓名	-
1235881547	3232423	234324	修改 删除
1235881555	43242	tegfd	修改 删除
1235881556	3452	bsks	修改 删除
1235881557	1535	yyy	修改 删除

[新增](#) [上一页](#) [下一页](#)

- 新增操作

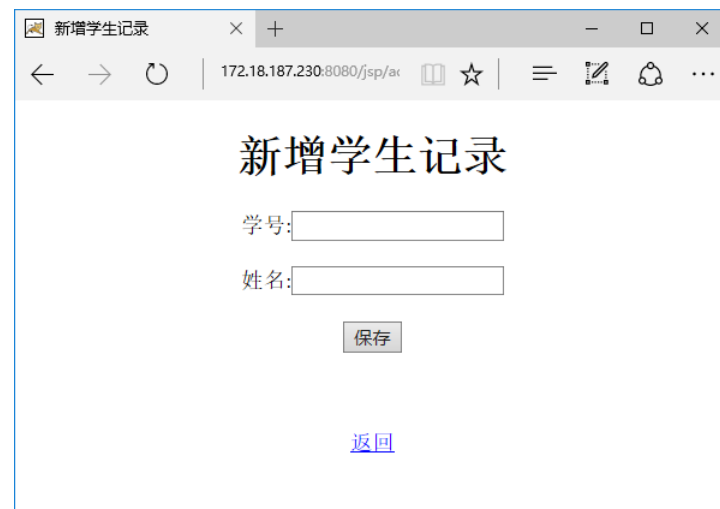
```
<%@ page language="java" import="java.util.*,java.sql.*"
    contentType="text/html; charset=utf-8"%>
<% request.setCharacterEncoding("utf-8");
    String msg = "";
    String connectString = "jdbc:mysql://localhost:53306/teaching"
        + "?autoReconnect=true&useUnicode=true&characterEncoding=UTF-8";
    String user="user"; String pwd="123";
    String num = request.getParameter("num");
    String name = request.getParameter("name");
    if(request.getMethod().equalsIgnoreCase("post")){
        Class.forName("com.mysql.jdbc.Driver");
        Connection con = DriverManager.getConnection(connectString,user, pwd);
        Statement stmt = con.createStatement();
        try{ String fmt="insert into stu(num,name) values('%s', '%s')";
            String sql = String.format(fmt,num,name);
            int cnt = stmt.executeUpdate(sql);
            if(cnt>0)msg = "保存成功!";
            stmt.close();    con.close();
        }catch (Exception e){
            msg = e.getMessage();
        }
    }
%>
```

* num和name在get网页时取值null，因为不用保持输入值，所以null不会出现在输入框。

```

<!DOCTYPE HTML><html><head><title>新增学生记录</title>
<style> a:link,a:visited {color:blue;}
.container{
    margin:0 auto;
    width:500px;
    text-align:center;
}
</style>
</head><body>
<div class="container">
    <h1>新增学生记录</h1>
    <form action="addStu.jsp" method="post" name="f">
        学号:<input id="num" name="num" type="text" >
        姓名:<input id="name" type="text" name="name" >
        <input type="submit" name="sub" value="保存">
    </form>
    <%=msg%>
    <a href='browseStu.jsp'>返回</a>
</div>
</body>
</html>

```



附录

附录1、hello_jsp.java程序

```
package org.apache.jsp;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.jsp.*;
public final class hello_jsp extends org.apache.jasper.runtime.HttpJspBase
    implements org.apache.jasper.runtime.JspSourceDependent {
    private static final javax.servlet.jsp.JspFactory __jspxFactory =
        javax.servlet.jsp.JspFactory.getDefaultFactory();
    ... //定义了对象: __jspx_dependants; __el_expressionfactory; __jsp_instancemanager;
    ...//定义了方法: getDependants() {...}, __jspInit(){...}, __jspDestroy() {...}
    ...
    public void __jspService(
        final javax.servlet.http.HttpServletRequest request,
        final javax.servlet.http.HttpServletResponse response)
        throws java.io.IOException, javax.servlet.ServletException {
    final javax.servlet.jsp.PageContext pageContext;
    javax.servlet.http.HttpSession session = null;
    final javax.servlet.ServletContext application;
    final javax.servlet.ServletConfig config;
    javax.servlet.jsp.JspWriter out = null;
    final java.lang.Object page = this;
    javax.servlet.jsp.JspWriter __jspx_out = null;
    javax.servlet.jsp.PageContext __jspx_page_context = null;
```

黑色的粗体字为JSP的基本内置对象

```
try {
    response.setContentType("text/html;charset=gb2312");
    pageContext = _jspxFactory.getPageContext(this, request, response,
        null, true, 8192, true);
    _jspx_page_context = pageContext;
    application = pageContext.getServletContext();
    config = pageContext.getServletConfig();
    session = pageContext.getSession();
    out = pageContext.getOut();
    _jspx_out = out;
    out.write("<html>\r\n");
    out.write("<head>\r\n");
    out.write("<title>Hello world</title>\r\n");
    out.write("</head>\r\n");
    out.write("<body>\r\n");
    out.print("Hello world!");
    out.write("</body>\r\n");
    out.write("</html>\r\n");
    out.write("\r\n");
}
```

```

        out.write("\r\n");
        out.write("\r\n");
    } catch (java.lang.Throwable t) {
        if (!(t instanceof javax.servlet.jsp.SkipPageException)){
            out = _jspx_out;
            if (out != null && out.getBufferSize() != 0)
                try { out.clearBuffer(); } catch (java.io.IOException e) {}
            if (_jspx_page_context != null)
                _jspx_page_context.handlePageException(t);
        }
    } finally {
        _jspxFactory.releasePageContext(_jspx_page_context);
    }
} // _jspService
} // class

```

附录2、JSP声明的源码转换

```
<%@ page contentType="text/html; charset=gb2312"%>
<%! int cnt = 0;
    int getSum(int n){
        int sum=0;
        for(int i=1;i<=n;i++){
            sum=sum+i;
        }
        return sum;
    }
    class Sum{
        int getSum(int n){
            int sum=0;
            for(int i=1;i<=n;i++){
                sum=sum+i;
            }
            return sum;
        }
    }
%>
<html><head><title>getSumFunc</title></head><body>
    <h1>getSumFunc</h1>
    <p>sum1:<%=getSum(100)%></p>
    <p>sum2:<%= Sum sum=new Sum();%><%=sum.getSum(100)%></p>
    count:<%=++cnt%>
</body></html>
```

getSumFuncClass.jsp

getSumFuncClass_jsp.jsp

```
package org.apache.jsp;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.jsp.*;
public final class getSumfuncClass_jsp extends
    org.apache.jasper.runtime.HttpJspBase
    implements org.apache.jasper.runtime.JspSourceDependent,
        org.apache.jasper.runtime.JspSourceImports {
    int cnt = 0;
    int getSum(int n) {
        int sum=0;
        for(int i=1;i<=n;i++){
            sum=sum+i;
        }
        return sum;
    }
    class Sum{
        int getSum(int n) {
            int sum=0;
            for(int i=1;i<=n;i++){
                sum=sum+i;
            }
            return sum;
        }
    }
}
```

```

private static final javax.servlet.jsp.JspFactory __jspxFactory =
    javax.servlet.jsp.JspFactory.getDefaultFactory();
private static java.util.Map<java.lang.String,java.lang.Long>
    __jspx_dependants;
private static final java.util.Set<java.lang.String> __jspx_imports_packages;
private static final java.util.Set<java.lang.String> __jspx_imports_classes;
static {
    __jspx_imports_packages = new java.util.HashSet<>();
    __jspx_imports_packages.add("javax.servlet");
    __jspx_imports_packages.add("javax.servlet.http");
    __jspx_imports_packages.add("javax.servlet.jsp");
    __jspx_imports_classes = null;
}
private volatile javax.el.ExpressionFactory __el_expressionfactory;
private volatile org.apache.tomcat.InstanceManager __jsp_instancemanager;
public java.util.Map<java.lang.String,java.lang.Long> getDependants() {
    return __jspx_dependants;
}
public java.util.Set<java.lang.String> getPackageImports() {
    return __jspx_imports_packages;
}
public java.util.Set<java.lang.String> getClassImports() {
    return __jspx_imports_classes;
}

```

```

public javax.el.ExpressionFactory _jsp_getExpressionFactory() {
    if (_el_expressionfactory == null) {
        synchronized (this) {
            if (_el_expressionfactory == null) {
                _el_expressionfactory =
                    _jspxFactory.getJspApplicationContext(getServletConfig().getS
                        ervletContext()).getExpressionFactory();
            }
        }
    }
    return _el_expressionfactory;
}

public org.apache.tomcat.InstanceManager _jsp_getInstanceManager() {
    if (_jsp_instancemanager == null) {
        synchronized (this) {
            if (_jsp_instancemanager == null) {
                _jsp_instancemanager =
                    org.apache.jasper.runtime.InstanceManagerFactory.getInstance
                        Manager(getServletConfig());
            }
        }
    }
    return _jsp_instancemanager;
}

public void _jspInit() {
}

public void _jspDestroy() {
}

```

```

public void _jspService(final javax.servlet.http.HttpServletRequest request,
                        final javax.servlet.http.HttpServletResponse response)
    throws java.io.IOException, javax.servlet.ServletException {
    final java.lang.String _jspx_method = request.getMethod();
    if (!"GET".equals(_jspx_method) && !"POST".equals(_jspx_method) &&
        !"HEAD".equals(_jspx_method)&&
        !javax.servlet.DispatcherType.ERROR.equals(request.getDispatcherType())
    ) {
        response.sendError(HttpServletResponse.SC_METHOD_NOT_ALLOWED, "JSPs only
        permit GET POST or HEAD");
        return;
    }
    final javax.servlet.jsp.PageContext pageContext;
    javax.servlet.http.HttpSession session = null;
    final javax.servlet.ServletContext application;
    final javax.servlet.ServletConfig config;
    javax.servlet.jsp.JspWriter out = null;
    final java.lang.Object page = this;
    javax.servlet.jsp.JspWriter _jspx_out = null;
    javax.servlet.jsp.PageContext _jspx_page_context = null;

```



```

try { response.setContentType("text/html;charset=gb2312");
    pageContext = _jspxFactory.getPageContext(this, request, response,
        null, true, 8192, true);
    _jspx_page_context = pageContext;
    application = pageContext.getServletContext();
    config = pageContext.getServletConfig();
    session = pageContext.getSession();
    out = pageContext.getOut();    _jspx_out = out;
    out.write('\r');
    out.write('\n');
    out.write("\r\n");
    out.write("<html>\r\n");
    out.write("<head>\r\n");
    out.write("<title>getSumFunc</title>\r\n");
    out.write("</head>\r\n");
    out.write("<body>\r\n");
    out.write("    <h1>getSumFunc</h1>\r\n");
    out.write("    <p>sum1:");
    out.print(getSum(100));
    out.write("</p>\r\n");
    out.write("    <p>sum2:");
    Sum sum=new Sum();
    out.print(sum.getSum(100));
    out.write("</p>\r\n");
    out.write("    count:");
    out.print(++cnt);
    out.write("\r\n");
    out.write("</body>\r\n");
    out.write("</html>\r\n");
}

```

```

catch (java.lang.Throwable t) {
    if (!(t instanceof javax.servlet.jsp.SkipPageException)) {
        out = _jspx_out;
        if (out != null && out.getBufferSize() != 0)
            try {
                if (response.isCommitted()) {
                    out.flush();
                } else {
                    out.clearBuffer();
                }
            }
        catch (java.io.IOException e) {}
        if (_jspx_page_context != null)
            _jspx_page_context.handlePageException(t);
        else
            throw new ServletException(t);
    }
} finally {
    _jspxFactory.releasePageContext(_jspx_page_context);
}
}
}

```