回顾课程

1 Servlet创建过程

```
1.创建类继承HttpServlet类，重写doGet和doPost
public void doPost(HttpServletRequest req,HttpServletResponse resp){
    //post处理请求
}

public void doGet(){
    doPost()
}

2.配置web.xml文件，交给Tomcat服务器进行创建
Tomcat按照生命周期，依次调用init  service   destroy()

3.浏览器或form引用配置的Servlet的url-pattern
```

2 HttpServletRequest对象

```
getParameter("name的属性值")
getParameterMap()
getParameterNames();
getParameterValues("复选框的name");

解决中文乱码问题：
POST:
 request.setCharacterEncoding("Utf-8")
GET:
 new String(字符串.getBytes("iso-8859-1"),"utf-8")
```

3 HttpServletResponse对象

```
设置状态码：response.setStatus(500);
设置响应头：下载
***设置响应体：
   字符流： getWriter()
   字节流：getOutpuStream()
解决中文乱码：
  response.setCharacterEncoding("Utf-8");
//  response.setHeader(“ContentType”，“text/html;charset=utf-8”);
  response.setContentType("text/html;charset=utf-8");
```

课程目标

1 域对象和转发 ===== 掌握

2 重定向 ===== 掌握

3 转发和重定向的区别 ==== 理解

4 JSP显示 ==== 掌握

课程实施

1 域对象

用来存储数据，在整个项目实现数据共享的对象。

1-1 域对象分类

ServletContext对象

HttpSession 对象

HttpServletRequest对象：request域对象，

共享访问：同一个请求中所有的资源可以数据共享

PageContext对象

1-2 域对象通用方法

域对象：底层就是Map。

```
setAttribute(Object key,Object value)
getAttribute(Object key): Object
removeAttribute(Object key):Object
```

1-3 课堂案例

```
1.Servlet1存入数据：userName:jack

2.Servlet2取出username的值，并使用sout输出
```

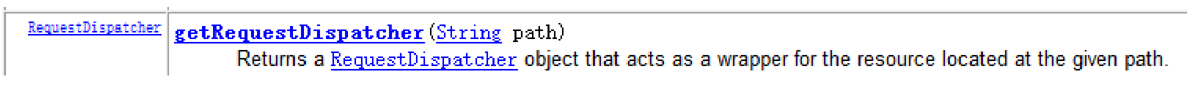
2 转发机制

转发：一定是基于request域对象存取数据前提。

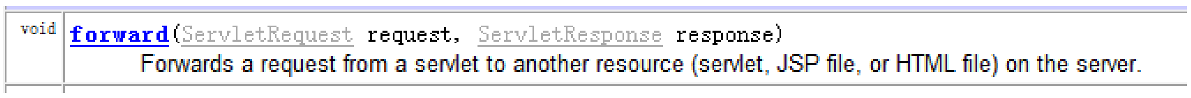
特点：浏览器不会出现新的请求

2-1 代码

```
//url地址不需要项目名
request.getRequestDisparcher(转发给哪个servlet的url-pattern).forward(request,response);
```



RequestDispatcher | getRequestDispatcher(String path)
Returns a RequestDispatcher object that acts as a wrapper for the resource located at the given path.



void | forward(ServletRequest request, ServletResponse response)
Forwards a request from a servlet to another resource (servlet, JSP file, or HTML file) on the server.

2-2 特点

```
1 浏览器不知道服务器内部有转发，所以浏览器的地址栏地址不会变化
2 转发多个Servlet或jsp的请求始终一个对象
3 多个Servlet之间代码的互相调用
```

3 域对象和转发的案例

```java
package com.servlet; /**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: ${PACKAGE_NAME}
 * @Version: 1.0
 */

import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.*;
import java.io.IOException;

@WebServlet("/SetDataServlet")//配置Servlet的url-pattern
public class SetDataServlet extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        //存入数据
        request.setAttribute("username","张三丰");
        //转发给GetDataServlet获取
        request.getRequestDispatcher("/GetDataServlet").forward(request,response);
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        doGet(request, response);
    }
}

```

```java
package com.servlet; /**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: ${PACKAGE_NAME}
 * @Version: 1.0
 */

import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.*;
import java.io.IOException;

@WebServlet("/GetDataServlet")
public class GetDataServlet extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        //1.获取Request对象保存的数据，并显示
        Object username = request.getAttribute("username");
        //System.out.println();
        response.setContentType("text/html;charset=utf-8");
        response.getWriter().print(username);
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        doGet(request, response);
    }
}

```

4 重定向

用在：servlet或jsp处理完请求之后，希望请求提交到其他资源且浏览器的地址栏要发生变化时。

常见使用场景：

登录成功后，重定向转向网站首页

注册成功后，重定向登录页

4-1 代码

```java
response.sendRedirect("jsp/servlet");//jsp或servlet的地址必须包含项目名
```

4-2 转发和重定向的区别

```
1.重定向地址栏会发生变化
2.重定向会产生新的请求，
3.跨域访问使用重定向，转发不能跨域
跨域：其他网站发出请求

```

4-3 重定向的实现原理

```
响应码：302
响应头：Location
```

重定向和转发的案例：实现登录成功后调整到首页

转发实现

```
package com.servlet; /**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: ${PACKAGE_NAME}
 * @Version: 1.0
 */

import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.*;
import java.io.IOException;

@WebServlet(name = "ServletA",urlPatterns = {"/A"})
public class ServletA extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        //登录
        //登录成功
        //跳转到首页显示
        if(true){
            //1.转发

 request.getRequestDispatcher("/main.html").forward(request,response);
        }
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        doGet(request, response);
    }
}

```

重定向实现

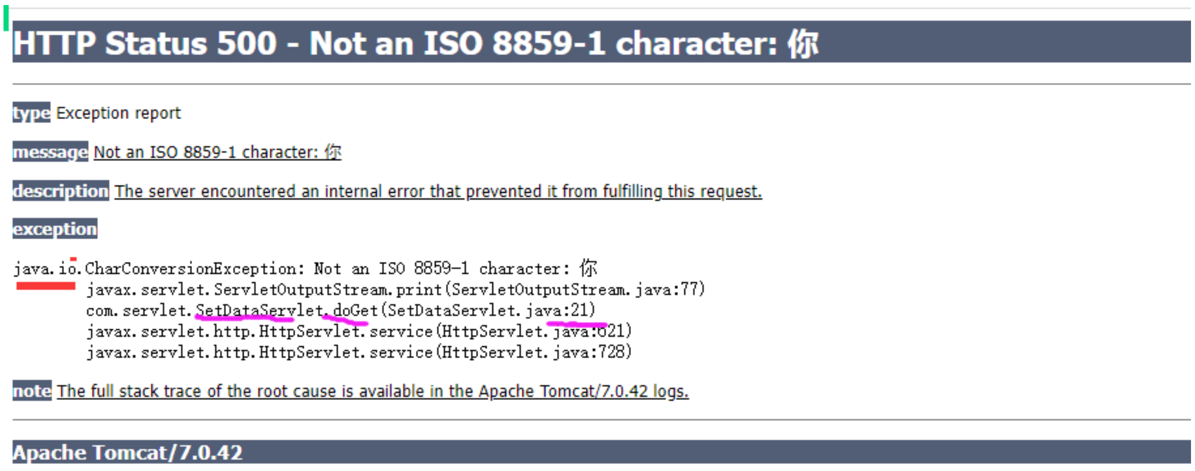
```
package com.servlet; /**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: ${PACKAGE_NAME}
 * @Version: 1.0
 */

import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.*;
import java.io.IOException;

@WebServlet(name = "ServletA",urlPatterns = {"/A"})
public class ServletA extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
```

```java
        //登录
        //登录成功
        //跳转到首页显示
        if(true){
            //2.重定向 302
            //response.sendRedirect("/web/main.html");//url地址
            //重定向原生代码
            response.setStatus(HttpServletResponse.SC_FOUND);
            response.setHeader("Location","/web/main.html");
        }
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        doGet(request, response);
    }
}
```



HTTP Status 500 - Not an ISO 8859-1 character: 你

type Exception report

message Not an ISO 8859-1 character: 你

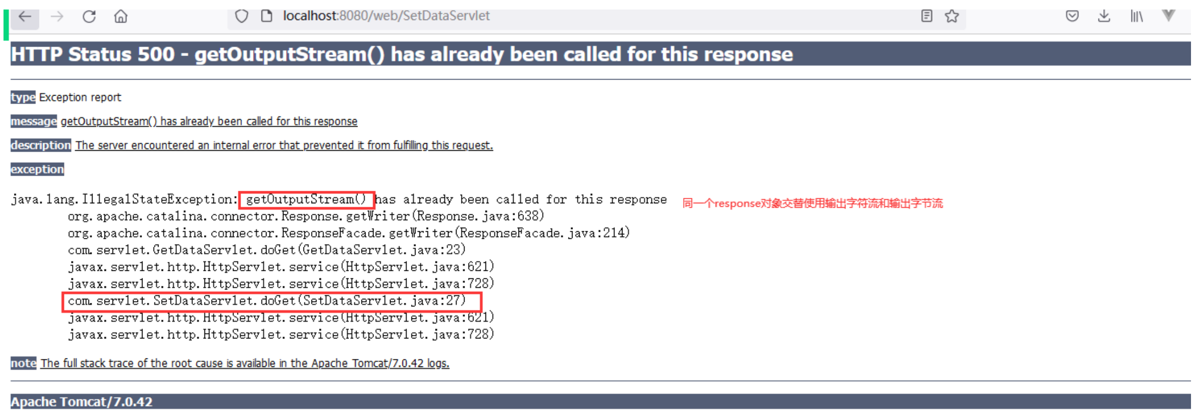
description The server encountered an internal error that prevented it from fulfilling this request.

exception

```
java.io.CharConversionException: Not an ISO 8859-1 character: 你
	javax.servlet.ServletOutputStream.print(ServletOutputStream.java:77)
	com.servlet.SetDataServlet.doGet(SetDataServlet.java:21)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:621)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:728)
```

note The full stack trace of the root cause is available in the Apache Tomcat/7.0.42 logs.

Apache Tomcat/7.0.42



localhost:8080/web/SetDataServlet

HTTP Status 500 - getOutputStream() has already been called for this response

type Exception report

message getOutputStream() has already been called for this response

description The server encountered an internal error that prevented it from fulfilling this request.

exception

```
java.lang.IllegalStateException: getOutputStream() has already been called for this response
	org.apache.catalina.connector.Response.getWriter(Response.java:638)
	org.apache.catalina.connector.ResponseFacade.getWriter(ResponseFacade.java:214)
	com.servlet.GetDataServlet.doGet(GetDataServlet.java:23)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:621)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:728)
	com.servlet.SetDataServlet.doGet(SetDataServlet.java:27)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:621)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:728)
```

同一个response对象交替使用输出字符流和输出字节流

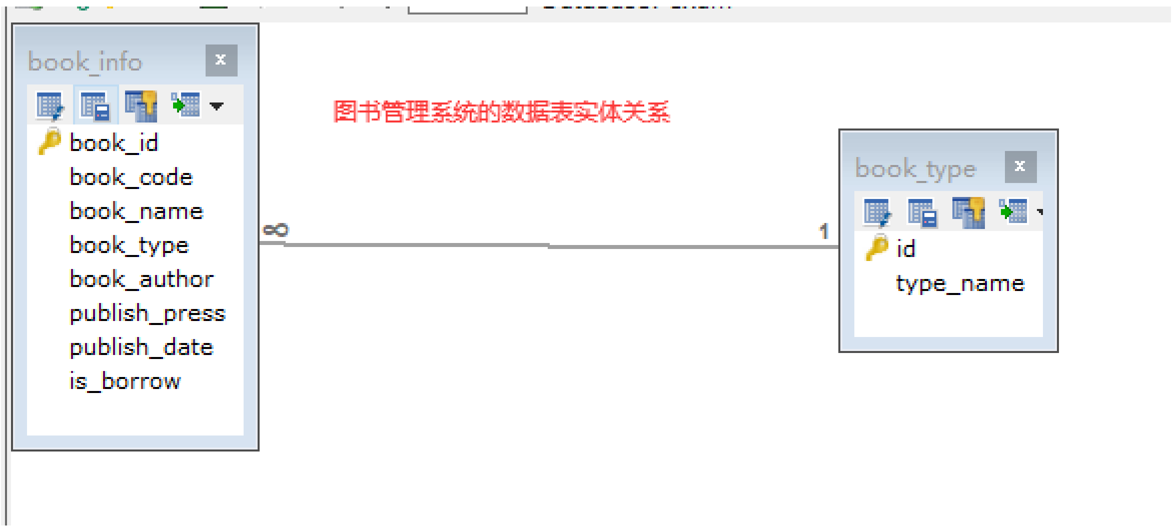
note The full stack trace of the root cause is available in the Apache Tomcat/7.0.42 logs.

Apache Tomcat/7.0.42

5 整合案例

需求：图书信息的显示

需求分析：



```
1.分析dao层的SQL语句
USE exam;
SELECT * FROM book_type;
SELECT * FROM book_info;

-- 显示所有的图书信息,图书分类（图书分类有则显示，没有显示NULL）
SELECT book_info.book_id id,book_info.book_code,
book_info.book_name,book_info.book_type,
book_info.book_author,book_info.publish_press,
book_info.publish_date,book_info.is_borrow,
book_type.type_name FROM book_info
LEFT JOIN book_type ON book_info.book_type=book_type.id

2.JDBC开发顺序：
2-1 确定sql之后，先将数据表转换为domain的表
注意：两表连接查询后，book_info表对应的实体类中，要出现关联表的字段名称
2-2 开发dao层：一个接口 一个实现类

2-3 开发service层：一个接口 一个实现类

2-4 测试JDBC代码，确认dao层代码没有任何问题，
再开发前端的：jsp或servlet
先做HTML或JSP
创建Servlet，Servlet只有四行代码：
取请求体数据--request.getParameter()
调用service层的方法-service对象
存入request域-request.setAttribute(key,调方法执行结果)
转发JSP/HTML-request.getRequestDispatcher().forward(request,response)


2-5 jsp主要的代码处理：
<%!
    jsp注释
%>
<% java处理代码：流程控制 %>
<%=网页上输出变量值%>
html显示数据的设计
<% 从域对象取数据，建议null非空验证 %>
```

```
<%= for或if 数据显示 %>
```

参考代码：

domain的BookInfo

```java
package cn.kgc.domain;

import java.util.Date;

/**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: 实体类列名和列类型与select查询结果集类型、列名一致
 * @Version: 1.0
 */
public class BookInfo {
    private Integer id;//数据库sql起别名
    private String book_code;
    private String book_name;
    private String book_author;
    private Integer book_type;
    private String publish_press;
    private Date publish_date;
    private boolean is_borrow;

    //连接查询，需要补充主表的信息
    private String type_name;

    public Integer getId() {
        return id;
    }

    public void setId(Integer id) {
        this.id = id;
    }

    public String getBook_code() {
        return book_code;
    }

    public void setBook_code(String book_code) {
        this.book_code = book_code;
    }

    public String getBook_name() {
        return book_name;
    }

    public void setBook_name(String book_name) {
        this.book_name = book_name;
    }

    public String getBook_author() {
        return book_author;
    }

    public void setBook_author(String book_author) {
        this.book_author = book_author;
    }

    public Integer getBook_type() {
        return book_type;
    }

    public void setBook_type(Integer book_type) {
        this.book_type = book_type;
    }

    public String getPublish_press() {
        return publish_press;
    }

    public void setPublish_press(String publish_press) {
        this.publish_press = publish_press;
    }

    public Date getPublish_date() {
        return publish_date;
    }

    public void setPublish_date(Date publish_date) {
        this.publish_date = publish_date;
    }

    public boolean isIs_borrow() {
        return is_borrow;
    }

    public void setIs_borrow(boolean is_borrow) {
        this.is_borrow = is_borrow;
    }

    public String getType_name() {
        return type_name;
    }

    public void setType_name(String type_name) {
        this.type_name = type_name;
    }

    @Override
    public String toString() {
        final StringBuilder sb = new StringBuilder("BookInfo{");
        sb.append("id=").append(id);
        sb.append(", book_code='").append(book_code).append('\'');
        sb.append(", book_name='").append(book_name).append('\'');
        sb.append(", book_author='").append(book_author).append('\'');
        sb.append(", book_type=").append(book_type);
        sb.append(", publish_press='").append(publish_press).append('\'');
        sb.append(", publish_date=").append(publish_date);
        sb.append(", is_borrow=").append(is_borrow);
        sb.append(", type_name='").append(type_name).append('\'');
        sb.append('}');
        return sb.toString();
    }
}
```

daoのBookInfoDao

```java
package cn.kgc.dao;

import cn.kgc.domain.BookInfo;

import java.util.List;

/**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: 查询、修改、删除和新增
 * @Version: 1.0
 */
public interface BookInfoDao {
    /**
     * 查询所有的图书信息
     * @return
     */
    List<BookInfo> selectAll();

    /**
     * 新增图书信息
     * @param book
     * @return
     */
    int insert(BookInfo book);
    int update(BookInfo book);

    /**
     * 删除一条或多条数据
     * @param pkIds
     * @return
     */
    int delete(Integer... pkIds);
}
```

daoのBookInfoDaoImpl

```java
package cn.kgc.dao.impl;

import cn.kgc.dao.BookInfoDao;
import cn.kgc.domain.BookInfo;
import cn.kgc.util.JDBCUtil;
import org.apache.commons.dbutils.QueryRunner;
import org.apache.commons.dbutils.handlers.BeanListHandler;

import java.sql.SQLException;
import java.util.List;

/**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: cn.kgc.dao.impl
 * @Version: 1.0
 */
public class BookInfoDaoImpl implements BookInfoDao {
    private QueryRunner qr=new QueryRunner(JDBCUtil.datasource);
    @Override
    public List<BookInfo> selectAll() {
        StringBuilder sb=new StringBuilder();
        sb.append("SELECT book_info.book_id id,book_info.book_code,");
        sb.append("book_info.book_name,book_info.book_type,");
        sb.append("book_info.book_author,book_info.publish_press,");
        sb.append("book_info.publish_date,book_info.is_borrow,");
        sb.append("book_type.type_name FROM book_info ");
        sb.append("LEFT JOIN book_type ON
book_info.book_type=book_type.id");
        //拼接查询条件

        //拼接排序

        //拼接limit 分页

        try {
            return qr.query(sb.toString(),new BeanListHandler<>
(BookInfo.class));
        } catch (SQLException e) {
            throw new RuntimeException(e);
        }
    }

    @Override
    public int insert(BookInfo book) {
        return 0;
    }

    @Override
    public int update(BookInfo book) {
        return 0;
    }

    @Override
    public int delete(Integer... pkIds) {
        return 0;
    }
}
```

serviceのBookInfoService

```java
package cn.kgc.service;

import cn.kgc.domain.BookInfo;

import java.util.List;

/**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: cn.kgc.service
 * @Version: 1.0
 */
public interface BookInfoService {
    /**
     * 获取所有的图书信息
     * @return
     */
    List<BookInfo> getAll();

    /**
     * 添加图书信息
     * @param book
     * @return
     */
    int add(BookInfo book);
    int modify(BookInfo book);

    /**
     * 删除一条或多条数据
     * @param pkIds
     * @return
     */
    int remove(Integer... pkIds);
}
```

serviceのBookInfoServiceImpl

```
package cn.kgc.service.impl;

import cn.kgc.dao.BookInfoDao;
import cn.kgc.dao.impl.BookInfoDaoImpl;
import cn.kgc.domain.BookInfo;
import cn.kgc.service.BookInfoService;

import java.util.List;

/**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: cn.kgc.service.impl
 * @Version: 1.0
 */
public class BookInfoServiceImpl implements BookInfoService {
    private BookInfoDao dao=new BookInfoDaoImpl();
    @Override
    public List<BookInfo> getAll() {
        return dao.selectAll();
    }

    @Override
    public int add(BookInfo book) {
        return dao.insert(book);
    }

    @Override
    public int modify(BookInfo book) {
        return dao.update(book);
```

```java
    }

    @Override
    public int remove(Integer... pkIds) {
        return dao.delete(pkIds);
    }
}
```

Servlet

```java
package cn.kgc.servlet; /**
 * @Author: lc
 * @Date: 2022/5/17
 * @Description: ${PACKAGE_NAME}
 * @Version: 1.0
 */

import cn.kgc.domain.BookInfo;
import cn.kgc.service.BookInfoService;
import cn.kgc.service.impl.BookInfoServiceImpl;

import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.util.List;

@WebServlet("/BookInfoServlet")
public class BookInfoServlet extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        //取 请求体或url地址传输的表单数据？略
        //调 service层
        BookInfoService service = new BookInfoServiceImpl();
        List<BookInfo> books = service.getAll();

        //存 共享
        request.setAttribute("list",books);

        //转
        //jsp本质就是一个servlet
        request.getRequestDispatcher("/list.jsp").forward(request,response);

    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        doGet(request, response);
    }
}
```

Jsp

主页

```html
<!DOCTYPE html>
<html lang="zh">
<head>
    <meta charset="utf-8"/>
    <title>图书管理系统</title>
</head>
<body>
<h1>欢迎进入图书管理系统</h1>
<a href="/web/BookInfoServlet">查看所有的图书信息</a>
</body>
</html>
```

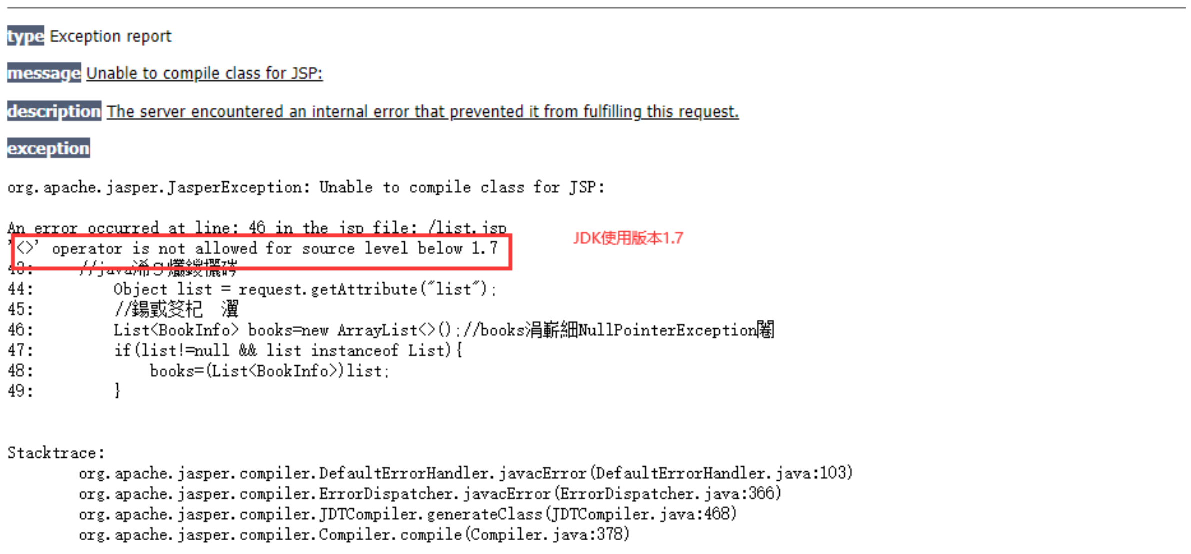
图书列表页

```jsp
<%@ page import="java.util.List" %>
<%@ page import="cn.kgc.domain.BookInfo" %>
<%@ page import="java.util.ArrayList" %>
<%@ page import="java.awt.print.Book" %>
<%--
JSP注释：浏览器上使用右键查看源代码，浏览器上看不到jsp注释
JSP:Java  Server Page java服务器上的网页
JSP组成：html+css+js+jq+java代码
//Servlet:java代码
//jsp:倾向数据显示
JSP extends HttpServlet{

}
--%>
<!--

  html注释：浏览器上使用右键查看源代码，会显示
-->
<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>
    <title>Title</title>
</head>
<body>
<%-- dreamwearver --%>
<table width="100%" border="1" cellspacing="0" cellpadding="0">
    <caption>
        图书信息一览表
    </caption>
    <tr>
        <th>编号</th>
        <th>图书编号</th>
        <th>图书名称</th>
        <th>图书分类</th>
        <th>图书作者</th>
        <th>出版社</th>
        <th>出版日期</th>
        <th>借阅状态</th>
        <th>查看详情</th>
        <th>操作</th>
    </tr>
    <%-- 数据从哪儿来？Servlet来--%>
    <%
        //java代码写法
        Object list = request.getAttribute("list");
        //向下转型 JDK基于1.7编译，不支持集合的泛型菱形语法
        List<BookInfo> books=new ArrayList<BookInfo>();//books不会NullPointerException问题
        if(list!=null && list instanceof List){
            books=(List<BookInfo>)list;
        }
        for(BookInfo book:books){
    %>
    <tr>
        <%-- 获取数据显示  --%>
        <td><%=book.getId() %></td>
        <td><%=book.getBook_code()%>></td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
        <td>&nbsp;</td>
    </tr>
    <%
        }
    %>
</table>
</body>
</html>
```

jsp运行异常



type Exception report

message Unable to compile class for JSP:

description The server encountered an internal error that prevented it from fulfilling this request.

exception

```
org.apache.jasper.JasperException: Unable to compile class for JSP:

An error occurred at line: 46 in the jsp file: /list.jsp
'<>' operator is not allowed for source level below 1.7
43:     //java浠ｇ爜鍐欐硶
44:         Object list = request.getAttribute("list");
45:         //鍚戜笅杞   瀷
46:         List<BookInfo> books=new ArrayList<>();//books涓嶄細NullPointerException闂
47:         if(list!=null && list instanceof List){
48:             books=(List<BookInfo>)list;
49:         }


Stacktrace:
        org.apache.jasper.compiler.DefaultErrorHandler.javacError(DefaultErrorHandler.java:103)
        org.apache.jasper.compiler.ErrorDispatcher.javacError(ErrorDispatcher.java:366)
        org.apache.jasper.compiler.JDTCompiler.generateClass(JDTCompiler.java:468)
        org.apache.jasper.compiler.Compiler.compile(Compiler.java:378)
```

JDK使用版本1.7

预习安排

图书管理系统：

图书查询

图书添加

图书修改

图书删除

分页查询+多条件模糊查询