EJB integration in a struts application

Introduction

The usage of enterprise java beans in combination with struts is the goal of this tutorial. We create an EJB project and use the business processes (methods) later in the Struts application. As an example we use a library application, where you can manage books and users. In additional it should be possible, that a user can borrow a book.

General

Author:
Sascha Wolski

Sebastian Hennebrüder

http://www.laliluna.de/tutorial.html – Tutorials für Struts, EJB, xdoclet und eclipse.

Date:
November, 22nd 2004
Development Tools

Eclipse 3.x
MyEclipse plugin 3.8
Database
PostgreSQL 8.0 Beta
Application Server
Jboss 3.2.5

Source code:

http://www.laliluna.de/assets/tutorials/struts-ejb-integration.zip

The sources does not contain the project files. So create a project first and copy the sources to this projects.

PDF Version des Tutorials:

http://www.laliluna.de/assets/tutorials/struts-ejb-integration-en.pdf

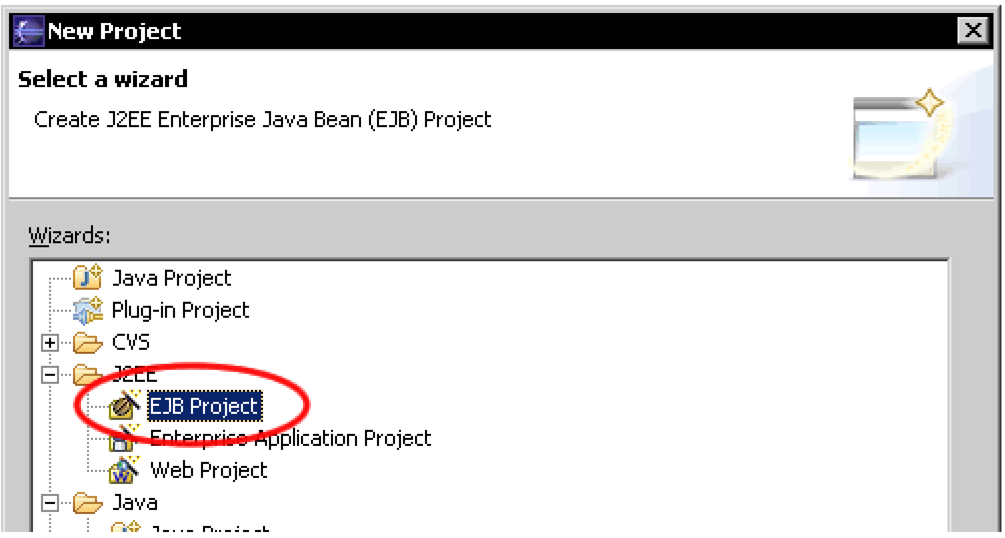
Requirements

We are not repeating all the basics here. Have a look at the basic EJB tutorials before you start this tutorial.

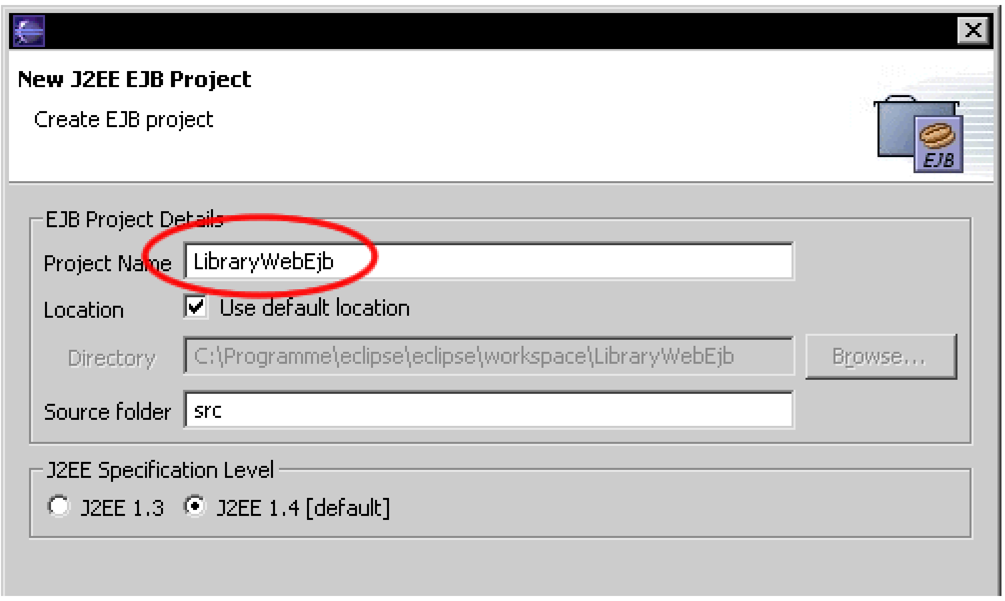
Table of Contents

Create a ejb project

Create a new enterpise java bean project (File > New > J2EE > EJB Project).

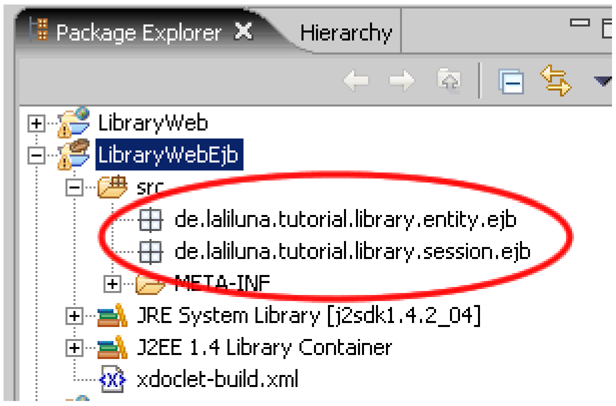


Set a nice name for the project. It is recommended that you add Ejb to the end of the project name, so it is evident that we are dealing with an ejb project.



Project Name: LibraryWebEjb
Location: [✓] Use default location
Directory: C:\Programme\eclipse\eclipse\workspace\LibraryWebEjb
Source folder: src
J2EE 1.3 [✓ J2EE 1.4 [default]]

Add a package for the entity and session beans
*You have to add **.ejb** to the end of the package name. In the default configuration xDoclet expects EJBs to be placed in such packages..*


Package Explorer
Hierarchy
LibraryWeb
LibraryWebEjb
src
de.laliluna.tutorial.library.entity.ejb
de.laliluna.tutorial.library.session.ejb
META-INF
JRE System Library [j2sdk1.4.2_04]
J2EE 1.4 Library Container
xdoclet-build.xml

Create a database and a datasource file

Create a new postgre database named `ejbexample`. Add a datasource file named `ejbexample-ds.xml` to the folder `Jboss/server/deploy`.

Examples for all kinds of supported databases can be found in the directory:

...\jboss-3.2.5\docs\examples\jca

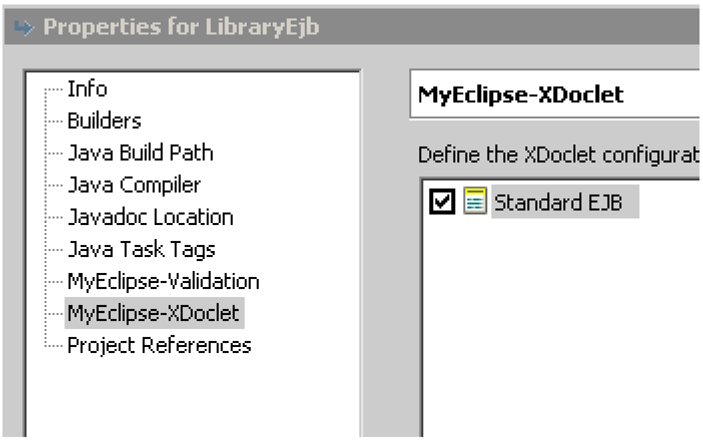
Add the following configuration to the file:

```
<datasources>
<local-tx-datasource>
<jndi-name>ejbexample</jndi-name>
<connection-url>jdbc:postgresql://localhost:5432/ejbexample</connection-url>
<driver-class>org.postgresql.Driver</driver-class>
<user-name>postgres</user-name>
<password>pgsql</password>
</local-tx-datasource>
</datasources>
```

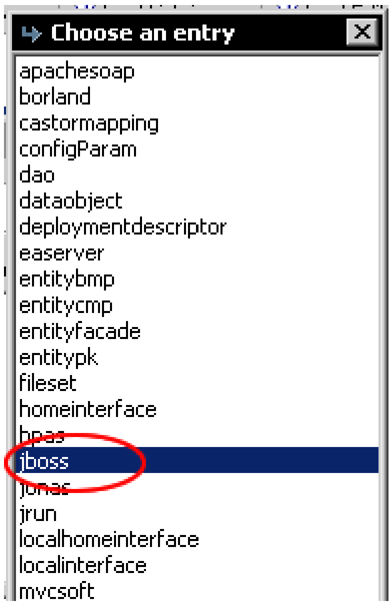
Be sure that the port, the user and the password are correct for your database.

Configure xDoclet

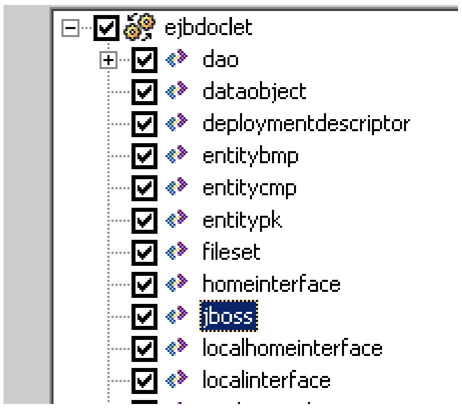
Open the project properties (Strg + Enter). On „MyEclipse- Xdoclet“ right click in the upper right window and choose „Add Standard“, than „Standard EJB“. Now you will find „Standard EJB“ in the uppen right window.



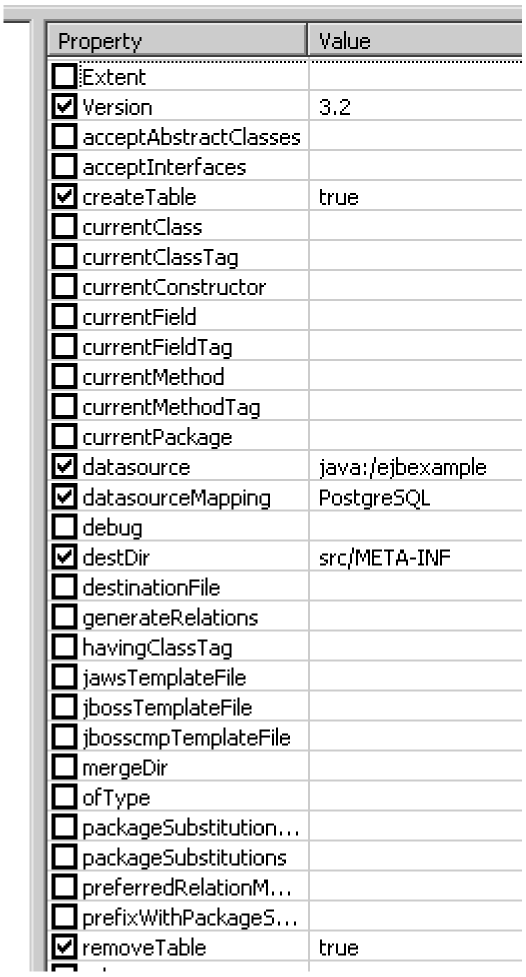
Choose „Standard EJB“ and call the menu „Add“ (right click) on the window below. Choose „jboss“ from the list.



Now you find a menu entry jboss.



Set up xDoclet as shown in the picture below.

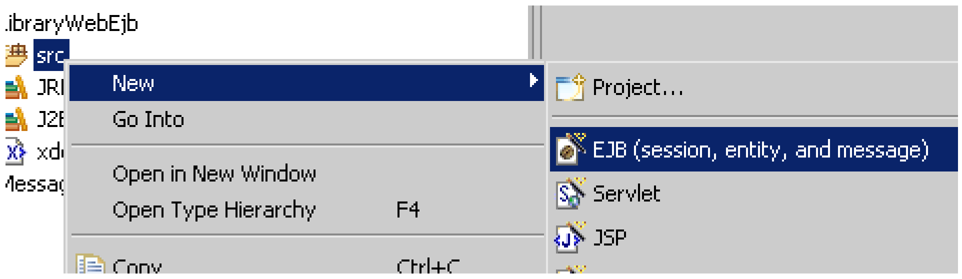


	Property	Value
☐	Extent	
☑	Version	3.2
☐	acceptAbstractClasses	
☐	acceptInterfaces	
☑	createTable	true
☐	currentClass	
☐	currentClassTag	
☐	currentConstructor	
☐	currentField	
☐	currentFieldTag	
☐	currentMethod	
☐	currentMethodTag	
☐	currentPackage	
☑	datasource	java:/ejbexample
☑	datasourceMapping	PostgreSQL
☐	debug	
☑	destDir	src/META-INF
☐	destinationFile	
☐	generateRelations	
☐	havingClassTag	
☐	jawsTemplateFile	
☐	jbossTemplateFile	
☐	jbosscmpTemplateFile	
☐	mergeDir	
☐	ofType	
☐	packageSubstitution...	
☐	packageSubstitutions	
☐	preferredRelationM...	
☐	prefixWithPackageS...	
☑	removeTable	true

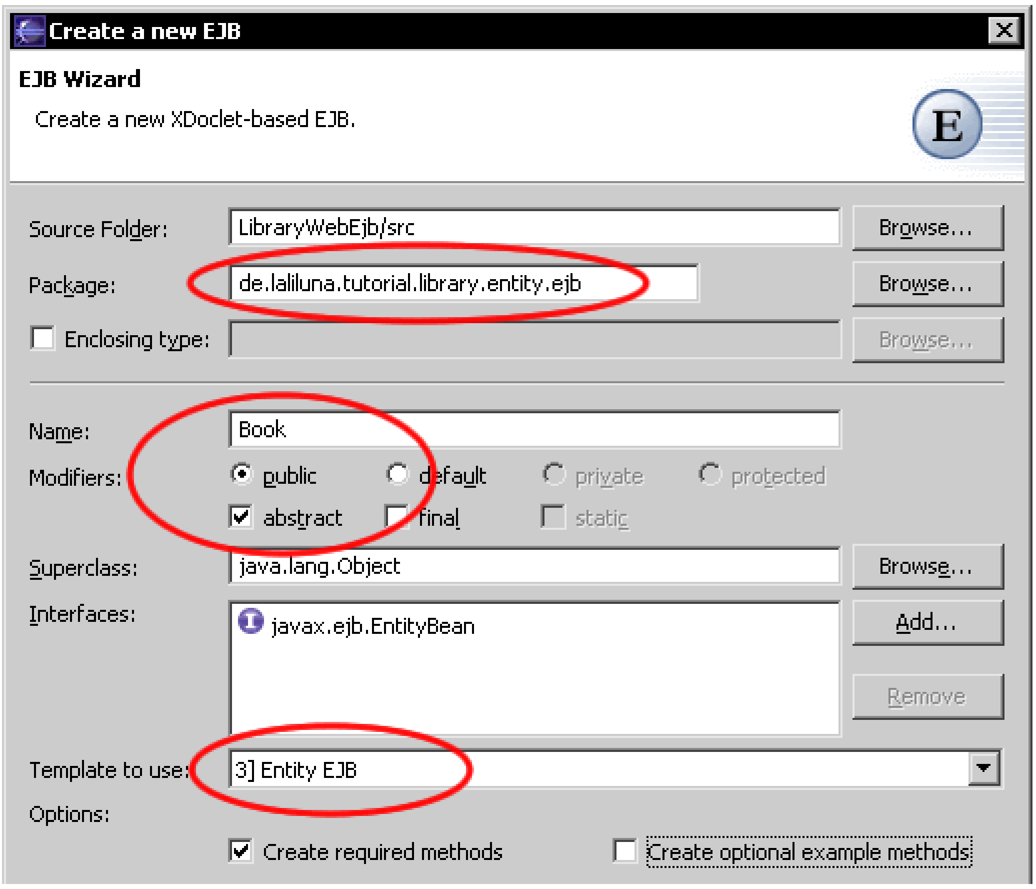
Thats all we need to do to configure xDoclet.

Create the entity beans

Create a new entity bean. Right click on the package > New > EJB(session...).



Set the properties like the picture below.



Source Folder: LibraryWebEjb/src
Package: de.laliluna.tutorial.library.entity.ejb
[ ] Enclosing type:
Name: Book
Modifiers: [● public] ○ default ○ private ○ protected
[✓ abstract] [ ] final [ ] static
Superclass: java.lang.Object
Interfaces: javax.ejb.EntityBean
Template to use: 3] Entity EJB
Options:
[✓ Create required methods] [ ] Create optional example methods

Create a second entity bean named `User`. Set it up like the bean befor.

Edit the entity beans

First we have to edit the xDoclet configuration for the class.

Entity Bean Book

```
/**
 * @author laliluna.de
 *
 * @ejb.bean name = "Book"
 *           type = "CMP"
 *           cmp-version = "2.x"
 *           display-name = "Book"
 *           description = "Book EJB"
 *           view-type = "both"
 *           jndi-name = "ejb/BookHome"
 *           local-jndi-name = "ejb/BookLocalHome"
 *          primkey-field = "id"
 *
 * @ejb.util generate="physical"
 * @ejb.persistence table-name = "tbooks"
 * @ejb.value-object match = "*" name="Book"
 *
 * @ejb.finder signature = "java.util.Collection findAll()"
 *             query = "select object(c) from Book as c"
 *
 * @jboss.persistence create-table = "true"
 *                    remove-table = "true"
 * @jboss.entity-command name="postgresql-fetch-seq"
 */
public abstract class Book implements EntityBean {
```

```
primkey-field = "id"
```

Define the primary key field of the class

```
@ejb.util generate="physical"
```

Define how the Util class will generated and which lookup method are used. We use the physical JNDI lookup.

@ejb.persistence table-name = "tbooks"

Define the real table name in your database

```
@ejb.value-object match = "*" name="Book"
```

Define the value object

Value Object Design Pattern

When you call a setName, setTitle method you create a roundtrip over the network between Application Server and Database Server. Roundtrips costs time. This is why, people invented the Value Object. Instead of working field per field a complete class instance is passed to methods or returned by them.

```
@ejb.finder signature = "java.util.Collection findAll()"
            query = "select object(c) from Book as c"
```

Define a finder method

```
@jboss.persistence create-table = "true"
                   remove-table = "true"
```

Define if the table will be automaticly created on deploy and removed on undeploy.

```
@jboss.entity-command name="postgresql-fetch-seq"
```

Define which entity command is used for generating the bean.

In the next step we define the properties of the entity beans. Which fields are included on the table.

The bean book has the following properties

- Id
- title
- author
- available
- user_id

Add the getter- and setter-methods for the properties:

```
      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fid"
       *                    sql-type = "SERIAL"
       *                    jdbc-type = "INTEGER"
       * @ejb.pk-field
       *
       * @return
       */
      public abstract Integer getId();

      /**
       * @ejb.interface-method view-type = "both"
       * @param id
       */
      public abstract void setId(Integer id);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "ftitle"
       * @return
       */
      public abstract String getTitle();

      /**
       * @ejb.interface-method view-type = "both"
       * @param title
       */
      public abstract void setTitle(String title);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fauthor"
       * @return
       */
      public abstract String getAuthor();

      /**
       * @ejb.interface-method view-type = "both"
       * @param author
       */
      public abstract void setAuthor(String author);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "favailable"
       * @return
       */
      public abstract Boolean getAvailable();

      /**
       * @ejb.interface-method view-type = "both"
       * @param available
       */
      public abstract void setAvailable(Boolean available);
      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fuser_id"
       * @return
       */
      public abstract Integer getUserId();

      /**
       * @ejb.interface-method view-type = "both"
       * @param user_id
       */
      public abstract void setUserId(Integer user_id);
```

After adding the getter- and setter-methods run xDoclet.
Notice: Right click on the project > MyEclipse > Run xDoclet

xDoclet generated the value object of the entity bean, so we can add a getter and setter for this object.

```
      /**
       * @ejb.interface-method view-type = "both"
       * @return
       */
      public abstract BookValue getBookValue();

      /**
       * @ejb.interface-method view-type = "both"
       * @param bookValue
       */
      public abstract void setBookValue(BookValue bookValue);
```

Entity Bean User

First we also edit the xDoclet configuration for the class

```
/**
 * @author laliluna.de
 *
 * @ejb.bean name = "User"
 *           type = "CMP"
 *           cmp-version = "2.x"
 *           display-name = "User"
 *           description = "User EJB"
 *           view-type = "both"
 *           jndi-name = "ejb/UserHome"
 *           local-jndi-name = "ejb/UserLocalHome"
 *                 primkey-field = "id"
 *
 * @ejb.util generate="physical"
 * @ejb.persistence table-name = "tusers"
 * @ejb.value-object match = "*" name="User"
 *
 * @ejb.finder signature = "java.util.Collection findAll()"
 *             query = "select object(c) from User as c"
 *
 * @jboss.persistence create-table = "true"
 *                    remove-table = "true"
 * @jboss.entity-command name="postgresql-fetch-seq"
 */
public abstract class User implements EntityBean {
```

The entity bean User has also four properties

- id
- lastName

- name
- age

Add the getter- and setter methods.

```
      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fid"
       *                  sql-type = "SERIAL"
       *                  jdbc-type = "INTEGER"
       * @ejb.pk-field
       *
       * @return
       */
      public abstract Integer getId();

      /**
       * @ejb.interface-method view-type = "both"
       * @param id
       */
      public abstract void setId(Integer id);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fname"
       * @return
       */
      public abstract String getName();

      /**
       * @ejb.interface-method view-type = "both"
       * @param name
       */
      public abstract void setName(String name);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "flastname"
       * @return
       */
      public abstract String getLastName();

      /**
       * @ejb.interface-method view-type = "both"
       * @param lastname
       */
      public abstract void setLastName(String lastname);

      /**
       * @ejb.interface-method view-type = "both"
       * @ejb.persistence column-name = "fage"
       * @return
       */
      public abstract Integer getAge();

      /**
       * @ejb.interface-method view-type = "both"
       * @param age
       */
      public abstract void setAge(Integer age);
```

Run xDoclet. After it has generated the Value Object class, you can implement the getters and setters for the value object.

```
      /**
       * @ejb.interface-method view-type = "both"
       * @return
       */
```

```
	public abstract UserValue getUserValue();

	/**
	 * @ejb.interface-method view-type = "both"
	 * @param userValue
	 */
	public abstract void setUserValue(UserValue userValue);
```

Add the relation

In your application a user can borrow a book, so we need a relation between the book bean and the user bean. A user can borrow many books, but one book can only be borrow by one user. Its a one to many relation between user and books .

Add the getter- and setter-methods for the relation. Make sure that the interface viewtype is local.

Book.java

```
	/**
	 * @ejb.interface-method view-type = "local"
	 * @ejb.relation name = "user_book"
	 *               role-name = "book_user"
	 * @jboss.relation related-pk-field = "id"
	 *                 fk-column = "fuser_id"
	 *                 fk-constraint = "true"
	 * @return
	 */
	public abstract UserLocal getUser();

	/**
	 * @ejb.interface-method view-type = "local"
	 * @param user
	 */
	public abstract void setUser(UserLocal user);
```

User.java

```
	/**
	 * @ejb.interface-method view-type = "local"
	 * @ejb.relation name = "user_book"
	 *               role-name = "user_book"
	 *
	 * @return Collection
	 */
	public abstract Collection getBooks();

	/**
	 * @ejb.interface-method view-type = "local"
	 * @param books
	 */
	public abstract void setBooks(Collection books);
```

The view classes for the value objects

It is possible that you edit the value object class, for example add the new method. But the problem arises when you run xDoclet again. It will replace the class and your method will be removed. Create a class that contain the value object and delegate the method of the class is a good and safe way to solve this problem. We name this class view, because it can contain additional methods for displaying, for example formated float value or sum of values.

We create a new package `de.laliluna.tutorial.library.view` und add two new classes `BookView` and `UserView`. Define the value object `BookValue` in the class `BookView` and the same for `UserValue` in `UserView`. Generate the getter- and setter-methods and delegate all methods of the objects.

Delegate pattern (design pattern)

If you want to add particular properties to a class, it is the best way to use composition. In our case we want to extend the class BookValue with the user, which has borrowed the book.

You create an outer class, which contains the class as locale variable. The class BookView behaves like a book, so we can define for each method of the class BookValue a delegate method.

With eclipse you can create easly delegate methods. In your souce code click the right mouse button and choose the function „Source“ -> „Delegate Methods“. Now you let MyEclipse create the delegate methods for you.

We need an additional object that contains the information of the user, who borrows the book, in your `BookView` class. We define an instance of the class `UserView` and generate the getter- and setter-methods.

The class looks like the following:

```
public class BookView {

      private BookValue bookValue = new BookValue();
      private UserView userView = new UserView();

      public BookValue getBookValue() {
            return bookValue;
      }
      public void setBookValue(BookValue bookValue) {
            this.bookValue = bookValue;
      }
      public UserView getUserView() {
            return userView;
      }
      public void setUserView(UserView userView) {
            this.userView = userView;
      }
      public boolean authorHasBeenSet() {
            return bookValue.authorHasBeenSet();
      }
      public boolean availableHasBeenSet() {
            return bookValue.availableHasBeenSet();
      }
      public boolean equals(Object arg0) {
            return bookValue.equals(arg0);
      }
      public String getAuthor() {
            return bookValue.getAuthor();
      }
      public Boolean getAvailable() {
            return bookValue.getAvailable();
      }
      public Integer getId() {
            return bookValue.getId();
      }
      public Integer getPrimaryKey() {
            return bookValue.getPrimaryKey();
      }
      public String getTitle() {
            return bookValue.getTitle();
      }
      public Integer getUserId() {
            return bookValue.getUserId();
      }
      public int hashCode() {
            return bookValue.hashCode();
      }
      public boolean idHasBeenSet() {
            return bookValue.idHasBeenSet();
      }
      public boolean isIdentical(Object other) {
            return bookValue.isIdentical(other);
      }
      public void setAuthor(String author) {
            bookValue.setAuthor(author);
      }
      public void setAvailable(Boolean available) {
            bookValue.setAvailable(available);
      }
      public void setId(Integer id) {
            bookValue.setId(id);
      }
      public void setPrimaryKey(Integer pk) {
            bookValue.setPrimaryKey(pk);
      }
      public void setTitle(String title) {
            bookValue.setTitle(title);
      }
      public void setUserId(Integer userId) {
            bookValue.setUserId(userId);
      }
      public boolean titleHasBeenSet() {
            return bookValue.titleHasBeenSet();
      }
      public String toString() {
            return bookValue.toString();
      }
      public boolean userIdHasBeenSet() {
            return bookValue.userIdHasBeenSet();
      }
}
```

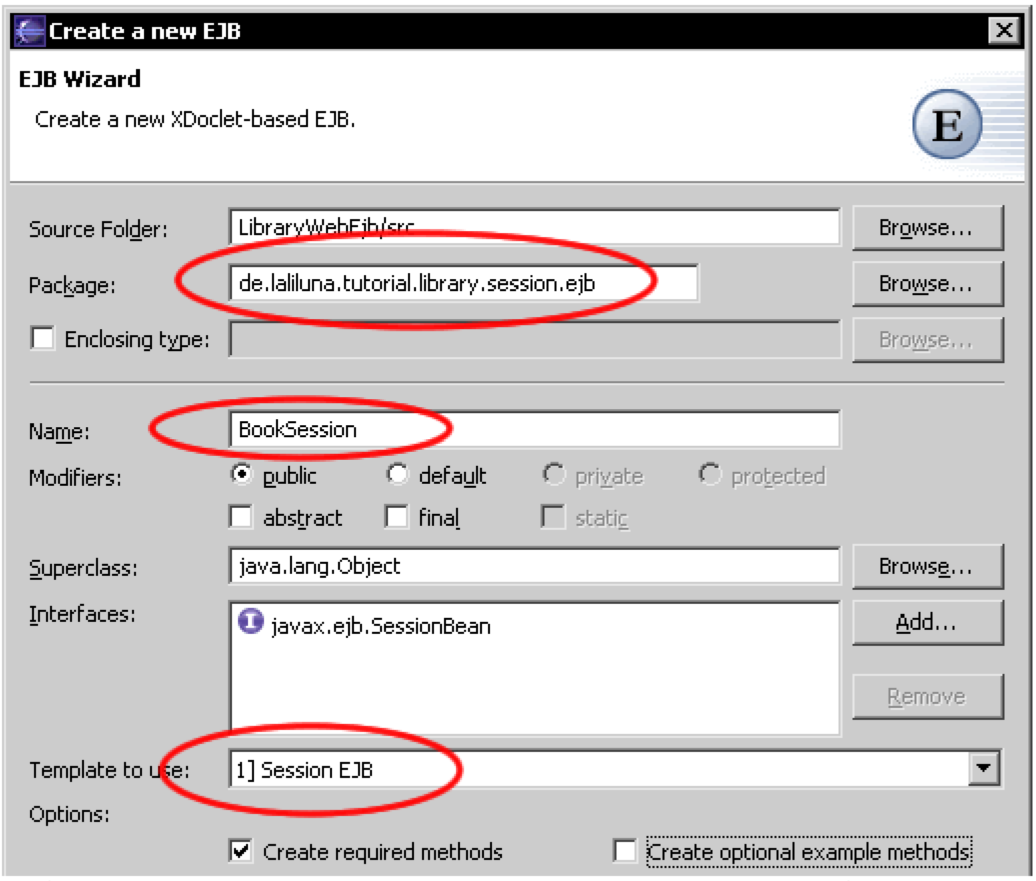
```
public class UserView {

      private UserValue userValue = new UserValue();


      public UserValue getUserValue() {
            return userValue;
      }
      public void setUserValue(UserValue userValue) {
            this.userValue = userValue;
      }
      public boolean ageHasBeenSet() {
            return userValue.ageHasBeenSet();
      }
      public boolean equals(Object arg0) {
            return userValue.equals(arg0);
      }
      public Integer getAge() {
            return userValue.getAge();
      }
      public Integer getId() {
            return userValue.getId();
      }
      public String getLastName() {
            return userValue.getLastName();
      }
      public String getName() {
            return userValue.getName();
      }
      public Integer getPrimaryKey() {
            return userValue.getPrimaryKey();
      }
      public int hashCode() {
            return userValue.hashCode();
      }
      public boolean idHasBeenSet() {
```

```
		return userValue.idHasBeenSet();
	}
	public boolean isIdentical(Object other) {
		return userValue.isIdentical(other);
	}
	public boolean lastNameHasBeenSet() {
		return userValue.lastNameHasBeenSet();
	}
	public boolean nameHasBeenSet() {
		return userValue.nameHasBeenSet();
	}
	public void setAge(Integer age) {
		userValue.setAge(age);
	}
	public void setId(Integer id) {
		userValue.setId(id);
	}
	public void setLastName(String lastName) {
		userValue.setLastName(lastName);
	}
	public void setName(String name) {
		userValue.setName(name);
	}
	public void setPrimaryKey(Integer pk) {
		userValue.setPrimaryKey(pk);
	}
	public String toString() {
		return userValue.toString();
	}
}
```

Create the session beans

Book Session Bean

Create a new session bean BookSession.
Right click on the package > New > EJB (Session...)


Create a new EJB

EJB Wizard

Create a new XDoclet-based EJB.

Source Folder: LibraryWebEjb/src

Package: de.laliluna.tutorial.library.session.ejb

☐ Enclosing type:

Name: BookSession

Modifiers: ● public ○ default ○ private ○ protected

☐ abstract ☐ final ☐ static

Superclass: java.lang.Object

Interfaces: javax.ejb.SessionBean

Template to use: 1] Session EJB

Options: ☑ Create required methods ☐ Create optional example methods

We want to add the following business processes to the session bean class BookSession.

- Get all existing books
- Get a book by primary key
- User borrow a book
- User return a book
- Update / add a book
- Remove a book

Get all existing books

Within the method `getAllBooks()` we call a finder, that get all existing books. A Finder is a search method of the entity bean, which can return one or more beans.

We only want to use view object, so the method loops over the returned collection of the finder and fill an array with the view objects.

```
/**
 * This method return all books as a collection
 *
 * @ejb.interface-method view-type = "both"
 */
public BookView[] getAllBooks() throws EJBException {
      try {
            InitialContext context = new InitialContext();
            //Get the home interface with JNDI from the application server
            BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);

            //get all books with the local home interface
            Collection collection = bookLocalHome.findAll();
            //define an ArrayList
            ArrayList arrayList = new ArrayList();

            //loop over the collection
            for (Iterator iter = collection.iterator(); iter.hasNext();) {
                  BookLocal element = (BookLocal) iter.next();

                  //define a new BookView object
                  BookView bookView = new BookView();

                  //set the BookValue in bookView
                  bookView.setBookValue(element.getBookValue());

                  //set the UserValue in bookView
                  if(element.getUser() != null)
                        bookView.getUserView().setUserValue(element.getUser().
getUserValue());

                  //add the bookView object to the ArrayList
                  arrayList.add(bookView);
            }

            //return the array of BookView
            return (BookView[])arrayList.toArray(new BookView[0]);

      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (FinderException e) {
            throw new EJBException(e.getMessage());
      }
}
```

Get a book by primary key

The method `getBookByPrimaryKey()` gets a book by the primary key and returns a BookView object.

```
/**
 * This methode get a book by primary key
 *
 * @ejb.interface-method view-type = "both"
 */
public BookView getBookByPrimaryKey(Integer primaryKey) throws EJBException {
      try {
            InitialContext context = new InitialContext();
            BookView bookView = new BookView();

            //Get the home interface with JNDI from the application server
            BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);

            //search for a book with the primary key
            BookLocal bookLocal = bookLocalHome.findByPrimaryKey(primaryKey);

            //set the BookValue object in BookView
            bookView.setBookValue(bookLocal.getBookValue());

            //set the UserValue in BookView
            if(bookLocal.getUser() != null)
                  bookView.getUserView().setUserValue(bookLocal.getUser().
getUserValue());

            //return the book value object
            return bookView;

      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
	} catch (FinderException e) {
		throw new EJBException(e.getMessage());
	}
}
```

User borrow a book

The method `borrowBook()` is called with the primary key of a book and a user. It saves the relation between the book and the user.

```
/**
 * This methode borrow a book for a user
 *
 * @ejb.interface-method view-type = "both"
 */
public void borrowBook(Integer primaryKey, Integer userPrimaryKey) throws
EJBException {
	try {
		InitialContext context = new InitialContext();

		//Get the home interface with JNDI from the application server
		BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);
		UserLocalHome userLocalHome = (UserLocalHome)context.lookup
(UserLocalHome.JNDI_NAME);

		//find the book by primary key
		BookLocal bookLocal = bookLocalHome.findByPrimaryKey(primaryKey);

		//find the user by primary key
		UserLocal userLocal = userLocalHome.findByPrimaryKey
(userPrimaryKey);

		//set the local inferface of user to assign him to a book
		bookLocal.setUser(userLocal);

	} catch (NamingException e) {
		throw new EJBException(e.getMessage());
	} catch (FinderException e) {
		throw new EJBException(e.getMessage());
	}
}
```

User return a book

This method remove the relation between one book and one user. The user return the book.

```
/**
 * This methode return a book from a user by primary key
 *
 * @ejb.interface-method view-type = "both"
 */
public void returnBook(Integer primaryKey) throws EJBException {
	try {
		InitialContext context = new InitialContext();

		//Get the home interface with JNDI from the application server
		BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);

		//find a book by primary key
		BookLocal bookLocal = bookLocalHome.findByPrimaryKey(primaryKey);

		//remove the relation between the user
		bookLocal.setUser(null);
	} catch (NamingException e) {
		throw new EJBException(e.getMessage());
	} catch (FinderException e) {
		throw new EJBException(e.getMessage());
	}
}
```

Update / add a book

The task of the method is saving a book. If the method cannot find the primary key it add a new book, otherwise it update the properties.

```
/**
 * This method save the value object of the book
 *
 * @ejb.interface-method view-type = "both"
 */
public void saveBook(BookValue bookValue) throws EJBException {

	try {
		InitialContext context = new InitialContext();

		//Home Interface über JNDI beim Appliacation Server holen
		BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);

		//check if the book can be found for update, otherwise insert it as
a new book
		BookLocal bookLocal = null;
		try {
			if(bookValue.getId()==null)bookValue.setId(new Integer(0));
			bookLocal = bookLocalHome.findByPrimaryKey(bookValue.getId());
		} catch (FinderException e1) {
			bookLocal = bookLocalHome.create();
		}

		//update the values of the book
		bookLocal.setBookValue(bookValue);

	} catch (NamingException e) {
		throw new EJBException(e.getMessage());
	} catch (CreateException e) {
		throw new EJBException(e.getMessage());
	}
}
```

Remove a book

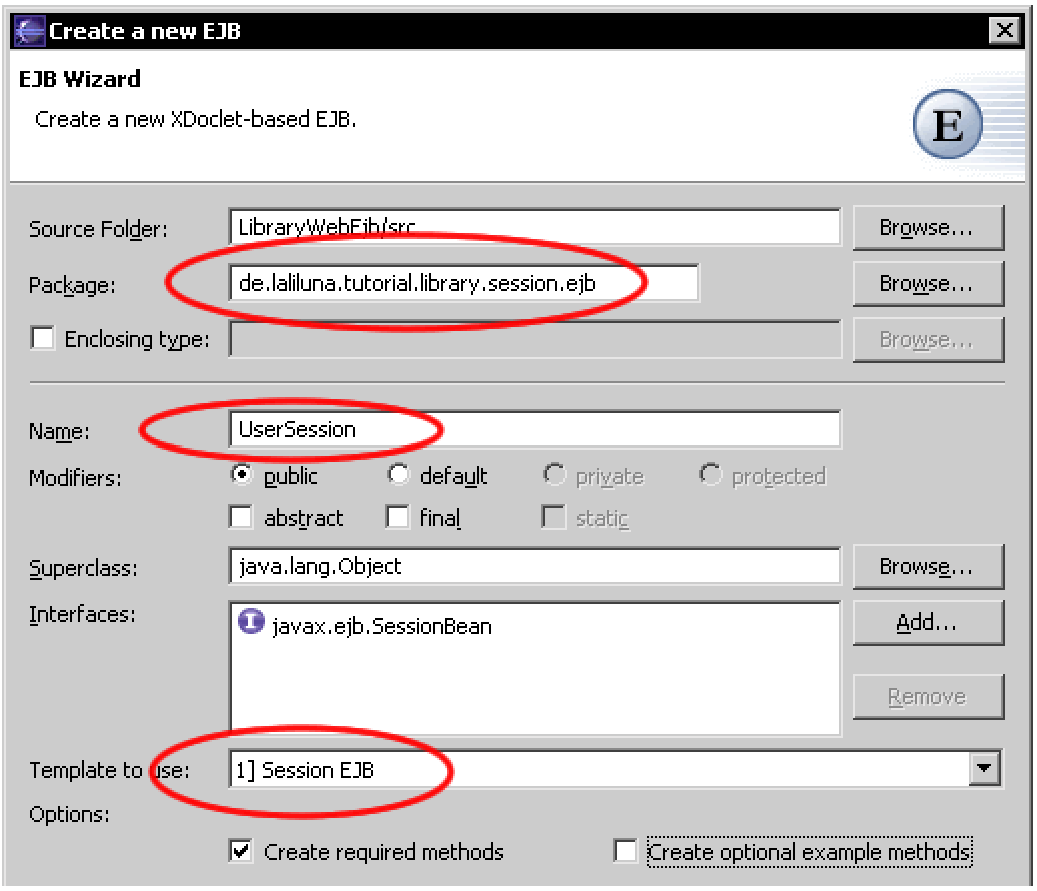
The method `removeBookByPrimaryKey()` deletes a book by its primary key.

```
/**
 * This method removes a book from the database
 *
 * @ejb.interface-method view-type = "both"
 */
public void removeBookByPrimaryKey(Integer primaryKey) throws EJBException {

	try {
		InitialContext context = new InitialContext();

		//Get the home interface with JNDI from the application server
		BookLocalHome bookLocalHome = (BookLocalHome)context.lookup
(BookLocalHome.JNDI_NAME);

		//find the book by primary key
		BookLocal bookLocal = bookLocalHome.findByPrimaryKey(primaryKey);
```

```
            //remove the book
            bookLocal.remove();

      } catch (RemoveException e) {
            throw new EJBException(e.getMessage());
      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (FinderException e) {
            throw new EJBException(e.getMessage());
      }
}
```

User Session Bean

Create a new session bean UserSession that contains the business processes of the users.



Create a new EJB

EJB Wizard

Create a new XDoclet-based EJB.

Source Folder: LibraryWebEjb/src

Package: de.laliluna.tutorial.library.session.ejb

Enclosing type: [ ]

Name: UserSession

Modifiers: [✓ public] default private protected

[ ] abstract [ ] final [ ] static

Superclass: java.lang.Object

Interfaces: javax.ejb.SessionBean

Template to use: 1] Session EJB

Options: [✓] Create required methods [ ] Create optional example methods

We also need methods for the following business methods.

- Get all users
- Get a user by primary key
- Update / add a user
- Delete a user

Get all users

This methods gets all users and returns a collection.

```
/**
 * This method return all users as a collection
 *
 * @ejb.interface-method view-type = "both"
 */
public Collection getAllUsers() throws EJBException {
      try {
            InitialContext context = new InitialContext();

            //Get the home interface with JNDI from the application server
            UserLocalHome userLocalHome = (UserLocalHome)context.lookup
(UserLocalHome.JNDI_NAME);

            //find all users and return them as collection
            return userLocalHome.findAll();

      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (FinderException e) {
            throw new EJBException(e.getMessage());
      }
}
```

Get a user by primary key

This method calls a finder to get user by primary key.

```
/**
 * This methode get a user by primary key
 *
 * @ejb.interface-method view-type = "both"
 */
public UserValue getUserByPrimaryKey(Integer primaryKey) throws EJBException {
      try {
            InitialContext context = new InitialContext();

            //Get the home interface with JNDI from the application server
            UserLocalHome userLocalHome = (UserLocalHome)context.lookup
(UserLocalHome.JNDI_NAME);

            //find a user by primary key
            UserLocal userLocal = userLocalHome.findByPrimaryKey(primaryKey);

            //return the book value object
            return userLocal.getUserValue();

      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (FinderException e) {
            throw new EJBException(e.getMessage());
      }
}
```

Update / add a user

The task of this method is saving a user. If the primary key of the user cannot be found, a new user will be created, otherwise the properties of the user will be updated.

```
/**
 * This methode update or add a user.
 *
 * @ejb.interface-method view-type = "both"
 */
public void saveUser(UserValue userValue) throws EJBException {
      try {
            InitialContext context = new InitialContext();
            //Get the home interface with JNDI from the application server
            UserLocalHome userLocalHome = (UserLocalHome)context.lookup
(UserLocalHome.JNDI_NAME);
```

```
            //check if the user can be found for update, otherwise insert it as
a new user
            UserLocal userLocal = null;
            try {
            if(userValue.getId()==null)userValue.setId(new Integer(0));
                  userLocal = userLocalHome.findByPrimaryKey(userValue.getId());
            } catch (FinderException e1) {
                  userLocal = userLocalHome.create();
            }

            //set the value object of the local interface
            userLocal.setUserValue(userValue);

      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (CreateException e) {
            throw new EJBException(e.getMessage());
      }
}
```

Remove a user

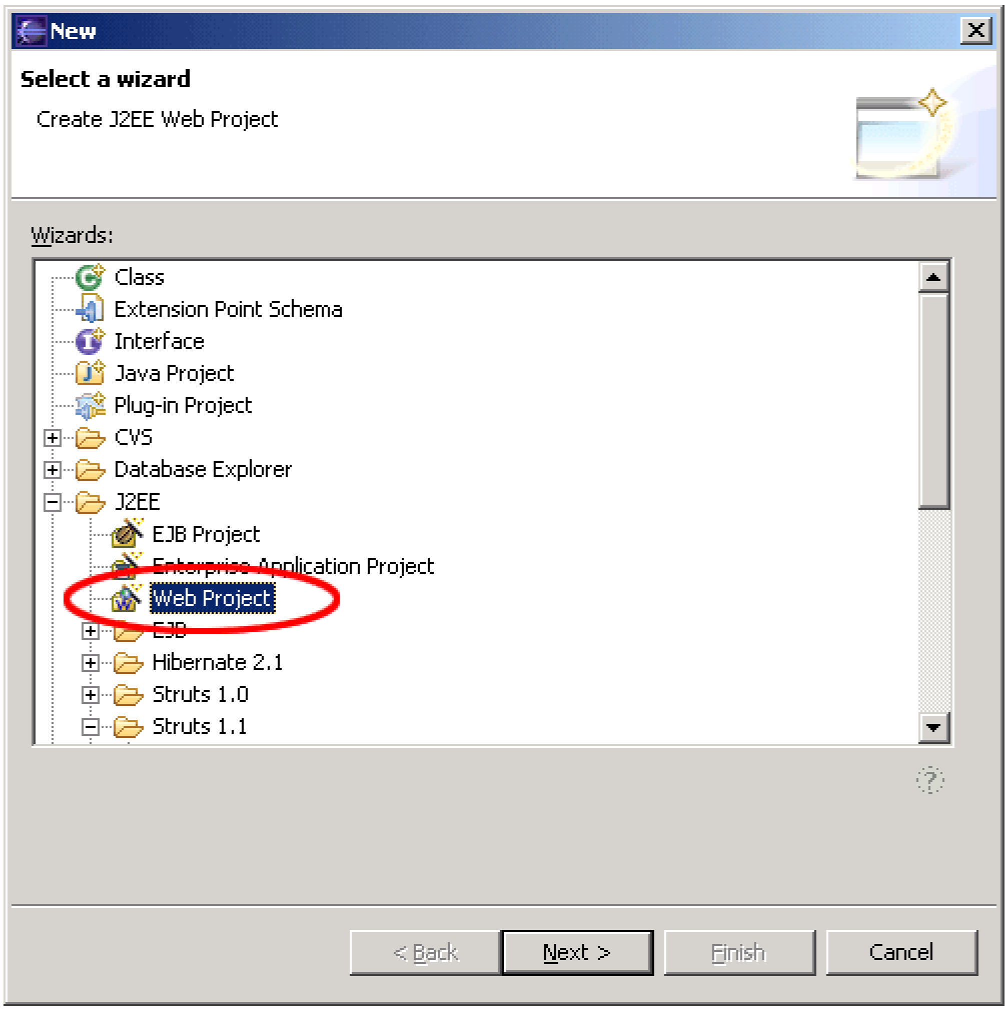
This method removes a user by its primary key.

```
/**
 * This method remove a user by primary key
 *
 * @ejb.interface-method view-type = "both"
 */
public void removeUserByPrimaryKey(Integer primaryKey) throws EJBException {

      try {
            InitialContext context = new InitialContext();

            //Get the home interface with JNDI from the application server
            UserLocalHome userLocalHome = (UserLocalHome)context.lookup
(UserLocalHome.JNDI_NAME);

            //find the user by primary key
            UserLocal userLocal = userLocalHome.findByPrimaryKey(primaryKey);

            //remove the user
            userLocal.remove();

      } catch (RemoveException e) {
            throw new EJBException(e.getMessage());
      } catch (NamingException e) {
            throw new EJBException(e.getMessage());
      } catch (FinderException e) {
            throw new EJBException(e.getMessage());
      }
}
```

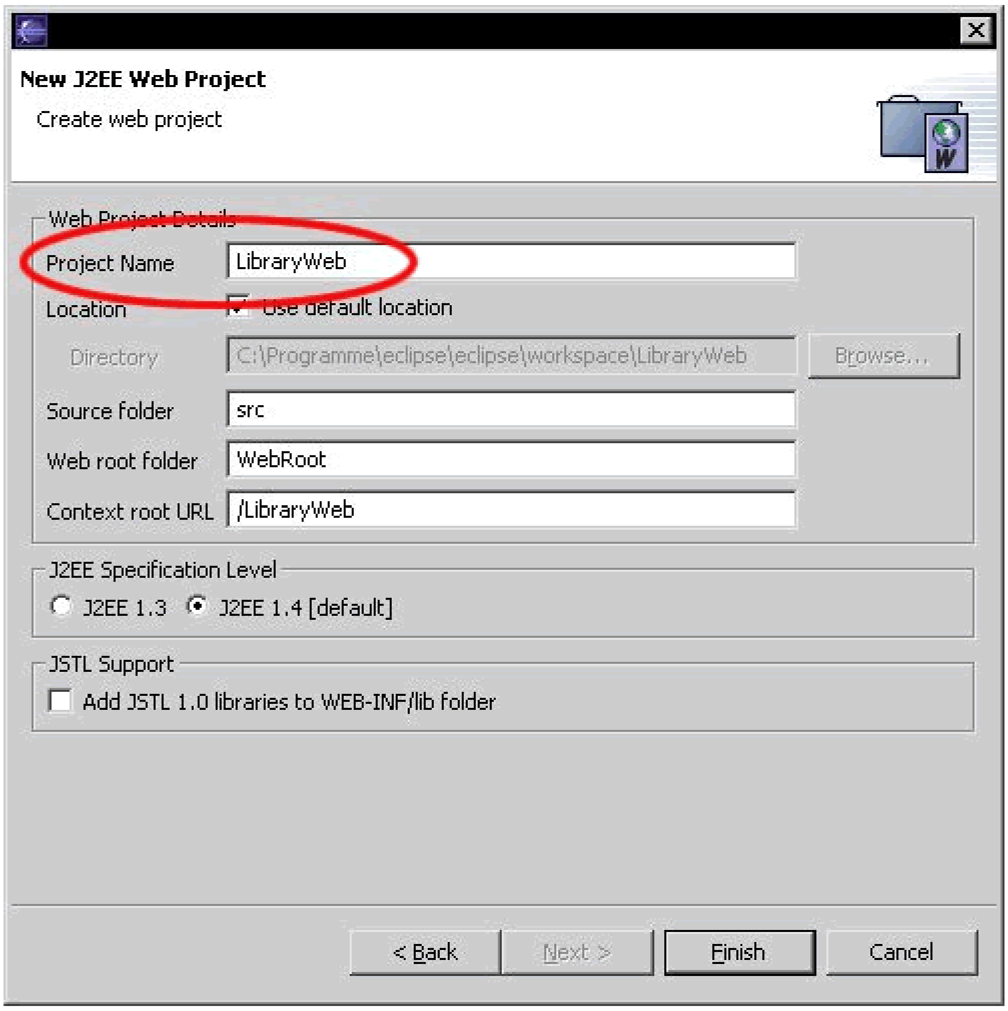
Congratulation, thats all.

Create the dialogs

Create a new struts project with `File > New > Project` or use the shortcut `Strg + n`.
Select the Wizard in J2EE `Web Project`.



Set a nice name for your project.



New J2EE Web Project

Create web project

Web Project Details

Project Name: LibraryWeb

Location: ✓ Use default location

Directory: C:\Programme\eclipse\eclipse\workspace\LibraryWeb   Browse...

Source folder: src

Web root folder: WebRoot

Context root URL: /LibraryWeb

J2EE Specification Level

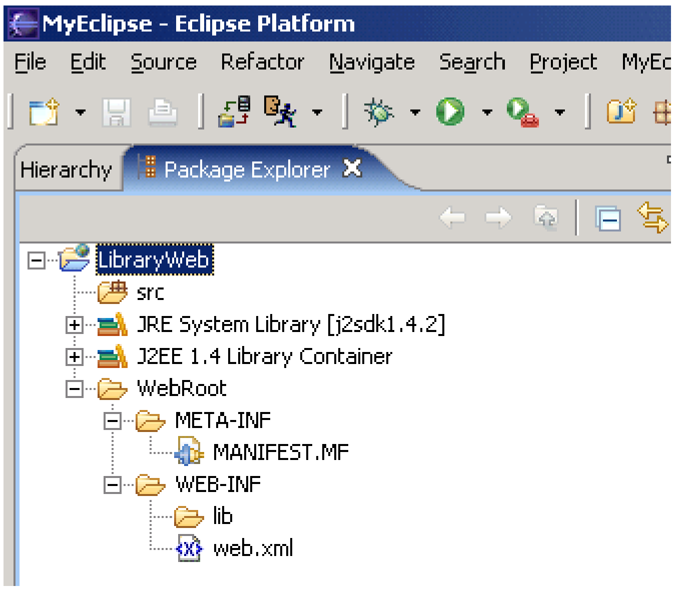
J2EE 1.3 [● J2EE 1.4 [default]]

JSTL Support

☐ Add JSTL 1.0 libraries to WEB-INF/lib folder

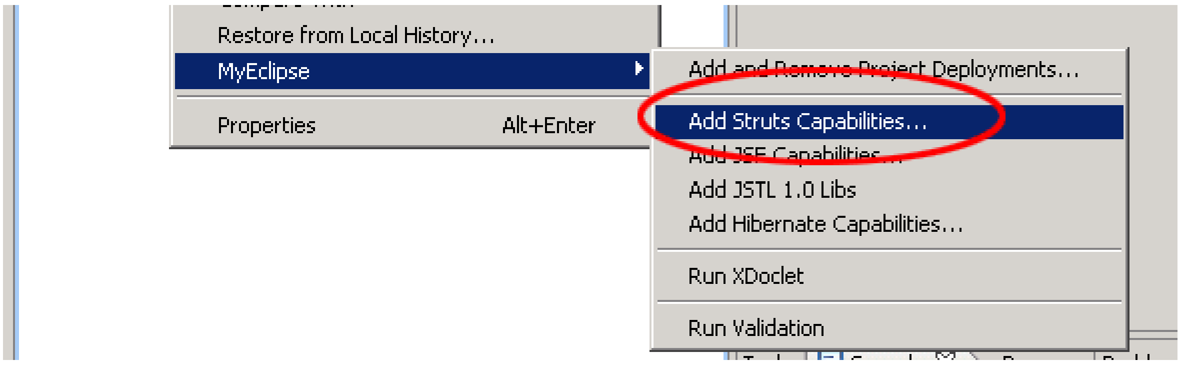
< Back   Next >   Finish   Cancel

After creating the project, your Package Explorer looks like the picture below.

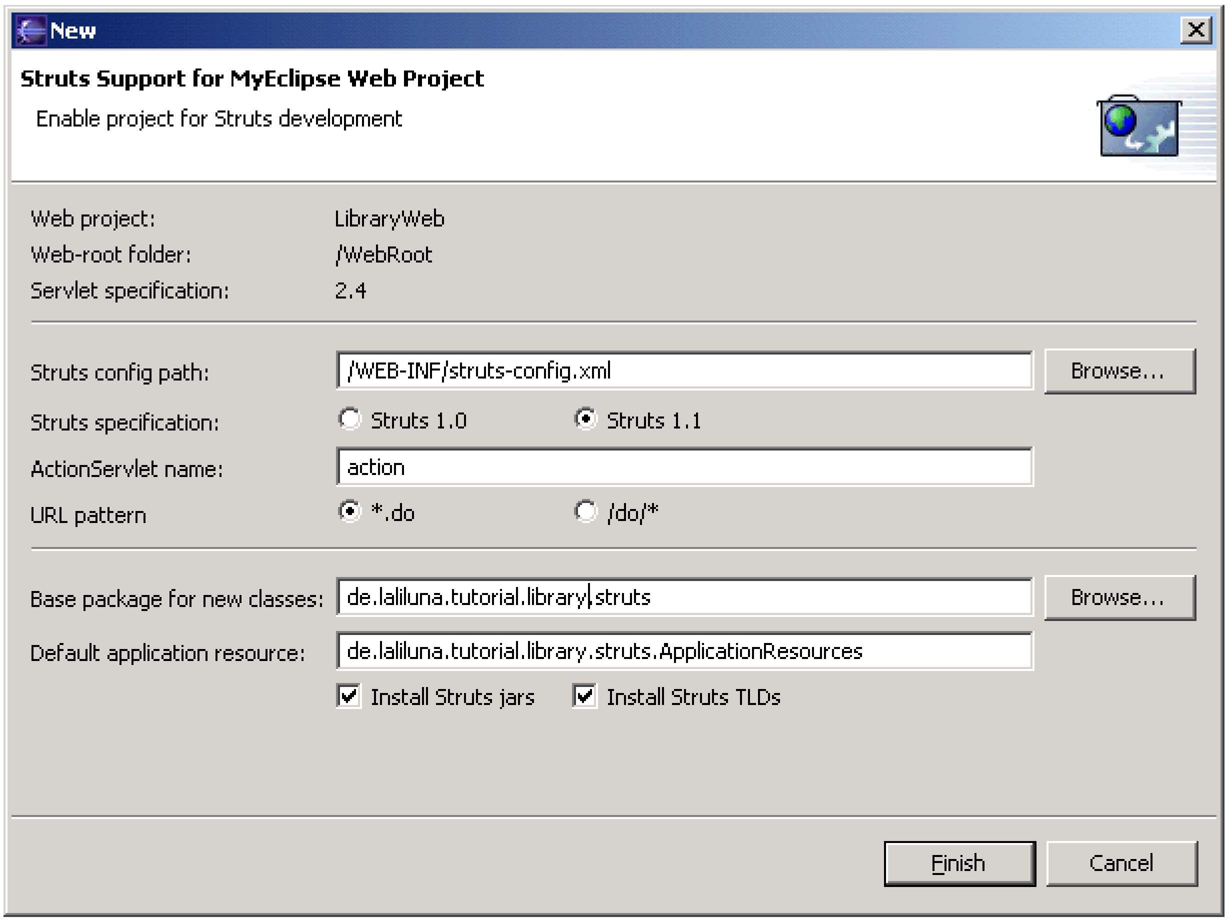


```
LibraryWeb
    src
    JRE System Library [j2sdk1.4.2]
    J2EE 1.4 Library Container
    WebRoot
        META-INF
            MANIFEST.MF
        WEB-INF
            lib
            web.xml
```

For now your project is still a normal J2EE project, so we need to add the struts capabilityies. Right click on the project and add the capabilityies for struts with `Add Struts Capabilityies.`


Restore from Local History...
MyEclipse
Properties Alt+Enter
Add and Remove Project Deployments...
Add Struts Capabilities...
Add JSF Capabilities...
Add JSTL 1.0 Libs
Add Hibernate Capabilities...
Run XDoclet
Run Validation

Change the `Base package for new classes` and `Default application resource`


New

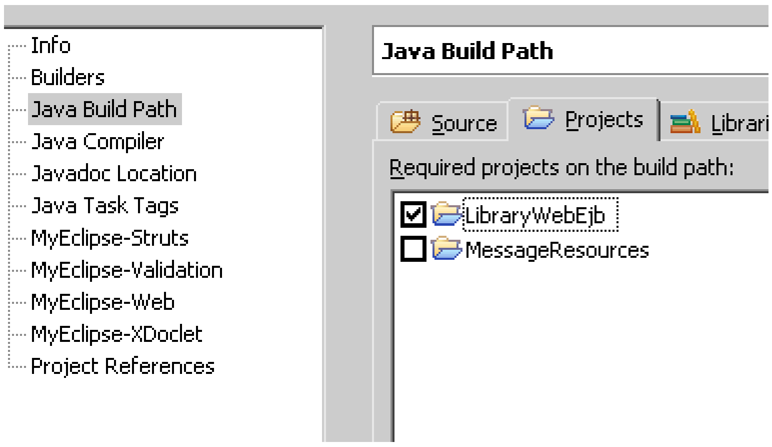
Struts Support for MyEclipse Web Project

Enable project for Struts development

Web project:	LibraryWeb
Web-root folder:	/WebRoot
Servlet specification:	2.4
Struts config path:	/WEB-INF/struts-config.xml
Struts specification:	Struts 1.0 [✓ Struts 1.1]
ActionServlet name:	action
URL pattern	[✓ *.do] /do/*
Base package for new classes:	de.laliluna.tutorial.library.struts
Default application resource:	de.laliluna.tutorial.library.struts.ApplicationResources
	[✓ Install Struts jars] [✓ Install Struts TLDs]

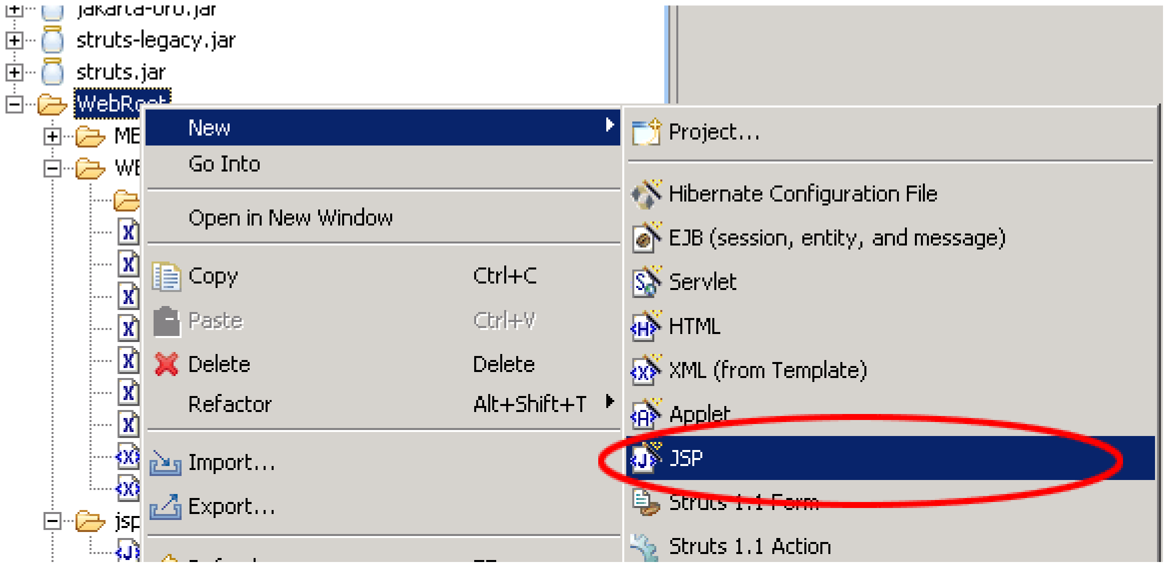
Configure the java build path

Open the project properties and select on java build path the ejb project „LibraryWebEjb“.

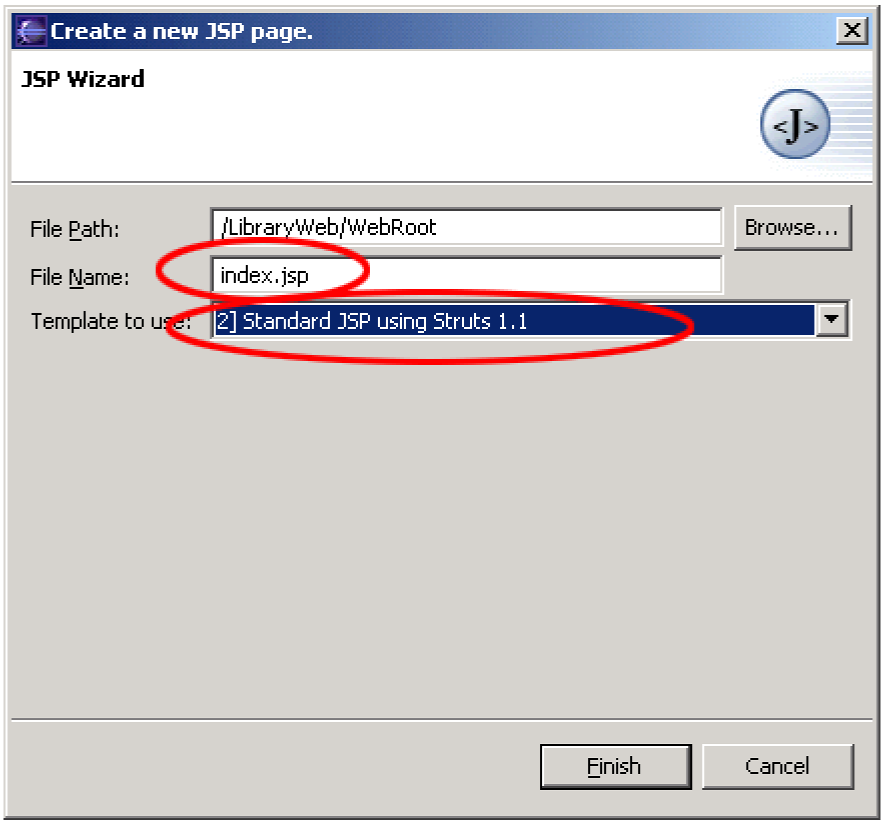


Create a default, welcome page

Ok, now we want to create a default page. Right click (yes again) on the Folder `WebRoot` in the Project and choose `New > JSP`.

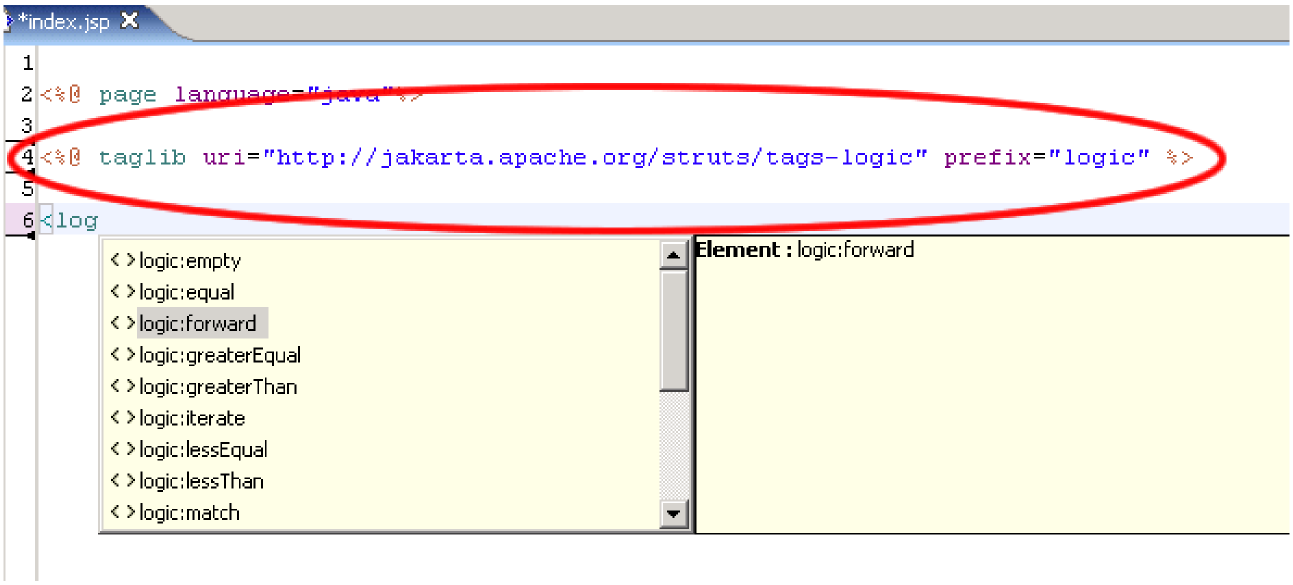


Set the name to `index.jsp` and choose on `template to use` > `Standard JSP using Struts 1.1` MyEcplise will use the template to create the JSP File.



File Path: /LibraryWeb/WebRoot
File Name: index.jsp
Template to use: 2] Standard JSP using Struts 1.1

You will find the file `index.jsp` in the folder `WebRoot` of the project. On the top of the file you will find the declaration of the struts tag libraries. These includes will be use to access the tags of struts. In this case we only need the logic tag library.



```

<%@ page language="java"%>

<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<log
```

Insert the following line below the included logic tag.

```
<logic:forward name="welcome" />
```

This line instructs struts to look for a forward with the name `welcome`. If the application don´t find this forward it will state an error. In the next section I briefly explain the action forward.

Create a second `index.jsp` file in the folder `/WebRoot/jsp`

Change the body of the file to the following:

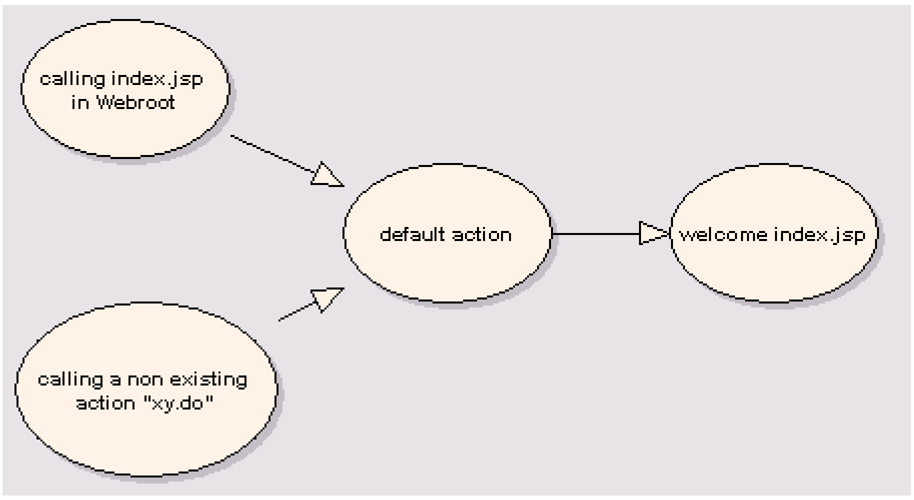
```
<body>
    Welcome!
    <br>
    <html:link action="bookList">Show the book list</html:link>
    <br>
    <html:link action="userList">Show the user list</html:link>
</body>
```

Global Action Forwards and Action Mappings

What is an action forward?
A action forward can be used to forward to a jsp or action mapping. There are two different action forwards. The global action forward and the local action forward. You can access a global action forward on each jsp or action class. A local action forward can only be accessed by the assigned action class.

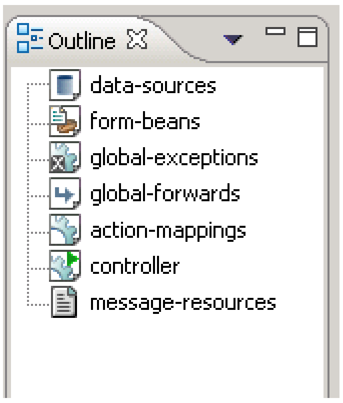
What is a action mapping?
The action mapping is the heart of struts. It managed all actions between the application and the user. You can define which action will be executed by creating a action mapping.

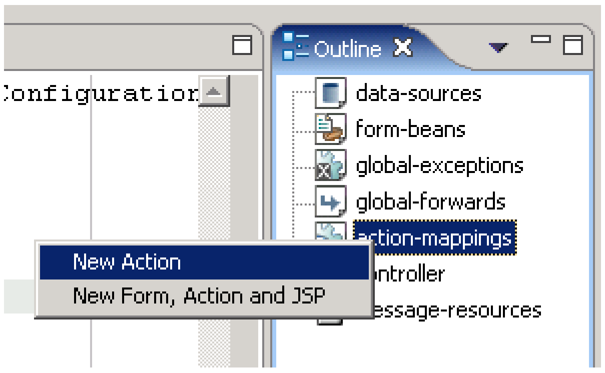
The diagram show you, how the application server manage the request of the `index.jsp` or a non existing action mapping.


calling index.jsp in Webroot
default action
welcome index.jsp
calling a non existing action "xy.do"

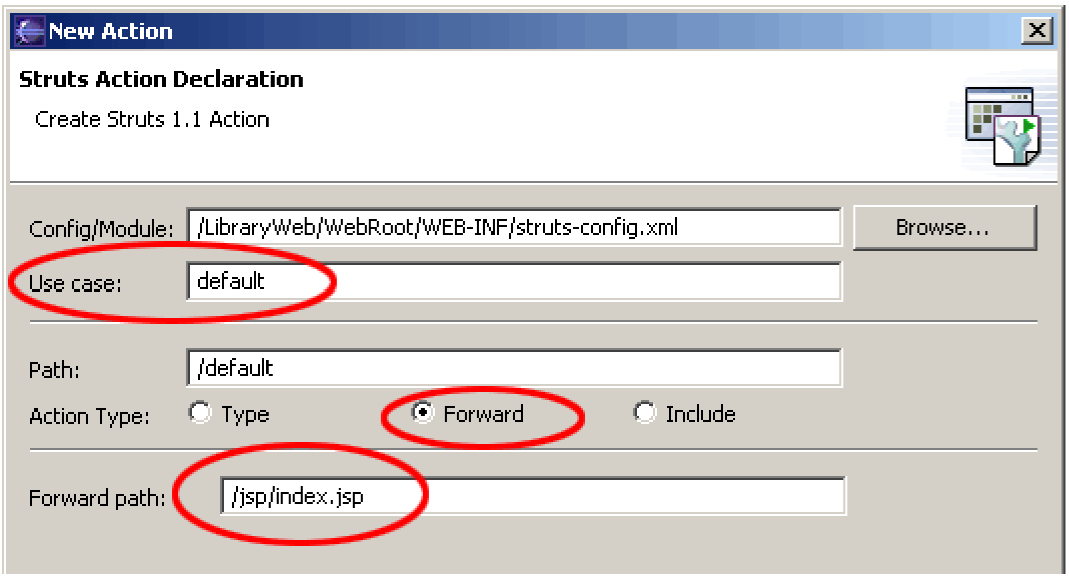
In the first step create a new action mapping. MyEclipse provides some nice features for creating struts files. Open the `struts-config.xml`, you will find it in the folder `WebRoot/WEB-INF`.

Click with the right mouse button on the entry action-mappings to create a new action with the wizard.





Choose `Use Case` default and `Action Type` Forward. The `Forward Path` is the welcome page `/jsp/index.jsp`



New Action

Struts Action Declaration

Create Struts 1.1 Action

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: default

Path: /default

Action Type: ( ) Type [✓ Forward] ( ) Include

Forward path: /jsp/index.jsp

To catch all requests of non existing action mappings, we have to add manually a parameter `unknow="true"` to the action forward.

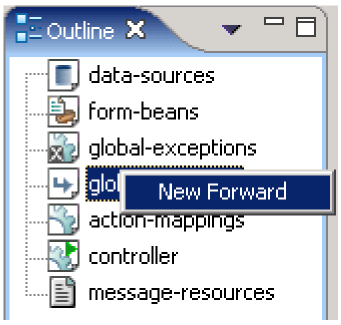
```
<action-mappings >
   <action forward="/jsp/index.jsp" path="/default" unknown="true"/>
</action-mappings>
```

Create the jsp specified above and change the code to the following:

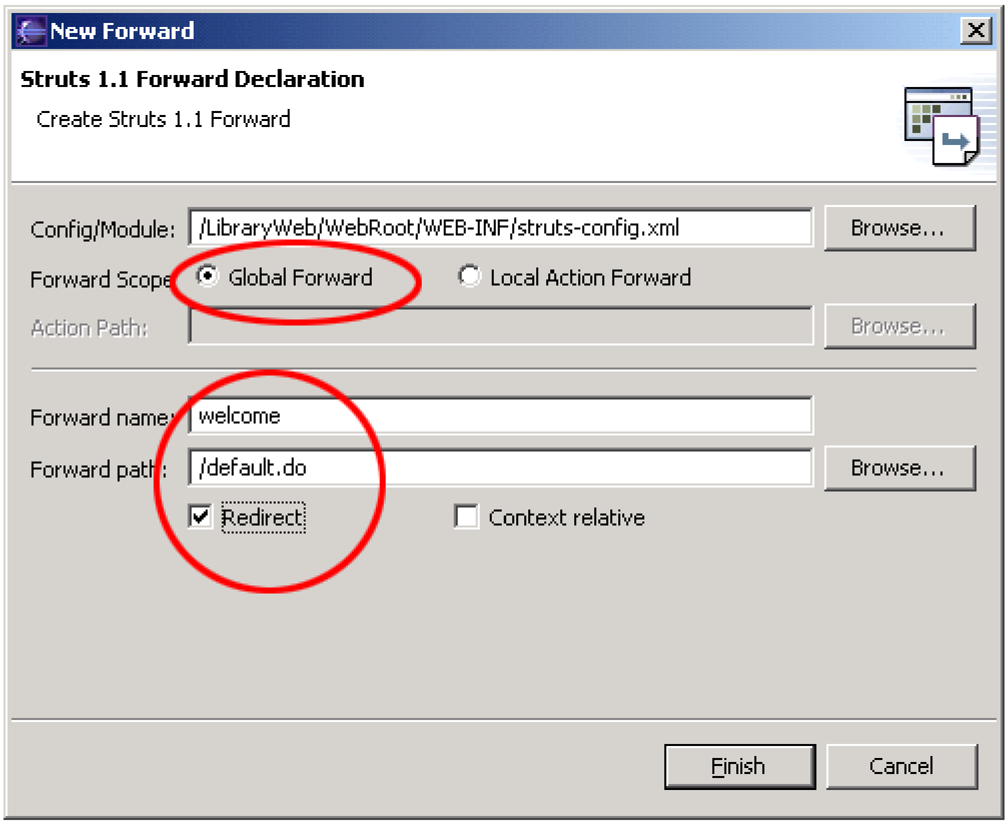
```
<%@ page language="java"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html" %>

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html:html locale="true">
  <head>
    <html:base />

    <title>index.jsp</title>

    <meta http-equiv="pragma" content="no-cache">
    <meta http-equiv="cache-control" content="no-cache">
    <meta http-equiv="expires" content="0">
    <meta http-equiv="keywords" content="keyword1,keyword2,keyword3">
    <meta http-equiv="description" content="This is my page">
  </head>

  <body>
```

```
    Welcome!
    <br>
    <html:link action="bookList">Show the book list</html:link>
    <br>
    <html:link action="userList">Show the user list</html:link>
  </body>
</html:html>
```

In the second step you create a global action forward. Go back to the outline window of MyEclipse and choose `Global Forward`



Choose the `Forward Scope` Global Forward. For name use the same you have set in your default page. The `Global Forward` refers to your action mapping.


New Forward

Struts 1.1 Forward Declaration

Create Struts 1.1 Forward

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Forward Scope: [✓ Global Forward] Local Action Forward

Action Path:

Forward name: welcome

Forward path: /default.do

[✓ Redirect] Context relative

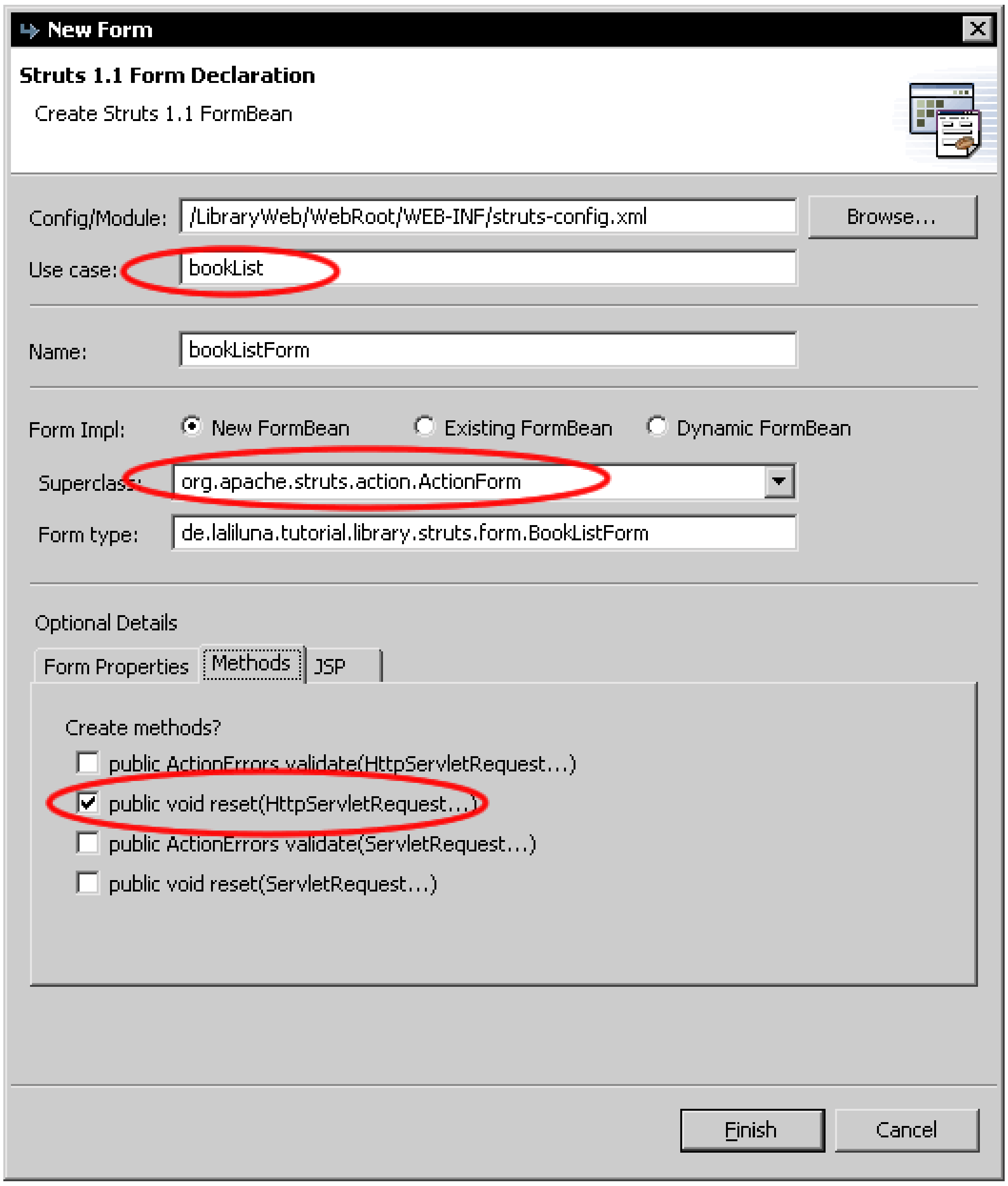
You will see the following in your editor window.

```
<global-forwards >
   <forward name="welcome" path="/default.do" redirect="true" />
</global-forwards>
<action-mappings >
   <action forward="/jsp/index.jsp" path="/default" unknown="true" />
</action-mappings>
```

Book list

This use case list all available books.

Open the `struts-config.xml`. Right click on `Form Bean` in the outline window.



New Form

Struts 1.1 Form Declaration

Create Struts 1.1 FormBean

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: bookList

Name: bookListForm

Form Impl: [✓ New FormBean] Existing FormBean Dynamic FormBean

Superclass: org.apache.struts.action.ActionForm

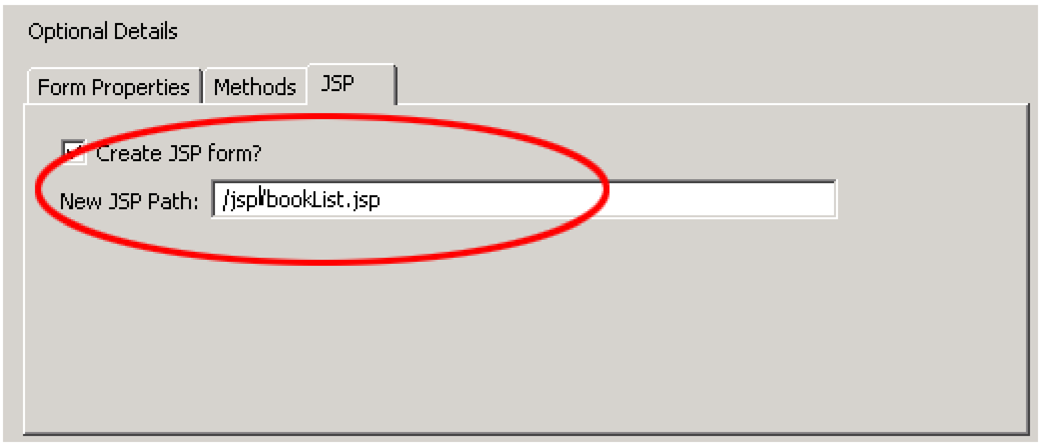
Form type: de.laliluna.tutorial.library.struts.form.BookListForm

Optional Details

Create methods?

- [ ] public ActionErrors validate(HttpServletRequest...)
- [x] public void reset(HttpServletRequest...)
- [ ] public ActionErrors validate(ServletRequest...)
- [ ] public void reset(ServletRequest...)

Use Case is `bookList`, Superclass `org.apache.struts.ActionForm`. Select `public void reset..` to create this method. Set the name of the jsp file on the JSP tab.

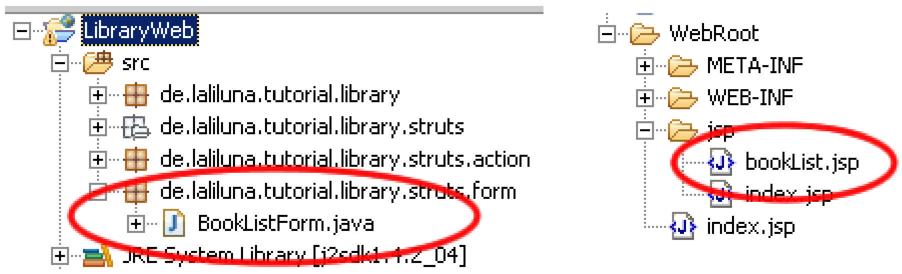

Optional Details

Form Properties | Methods | JSP

☑ Create JSP form?

New JSP Path: /jsp/bookList.jsp

The package explorer looks like the pictures below.


LibraryWeb
src
de.laliluna.tutorial.library
de.laliluna.tutorial.library.struts
de.laliluna.tutorial.library.struts.action
de.laliluna.tutorial.library.struts.form
BookListForm.java
JRE System Library [j2sdk1.4.2_04]
WebRoot
META-INF
WEB-INF
jsp
bookList.jsp
index.jsp
index.jsp

Edit the source code of the action form class

Open the file `BookListForm.java` and add the following.

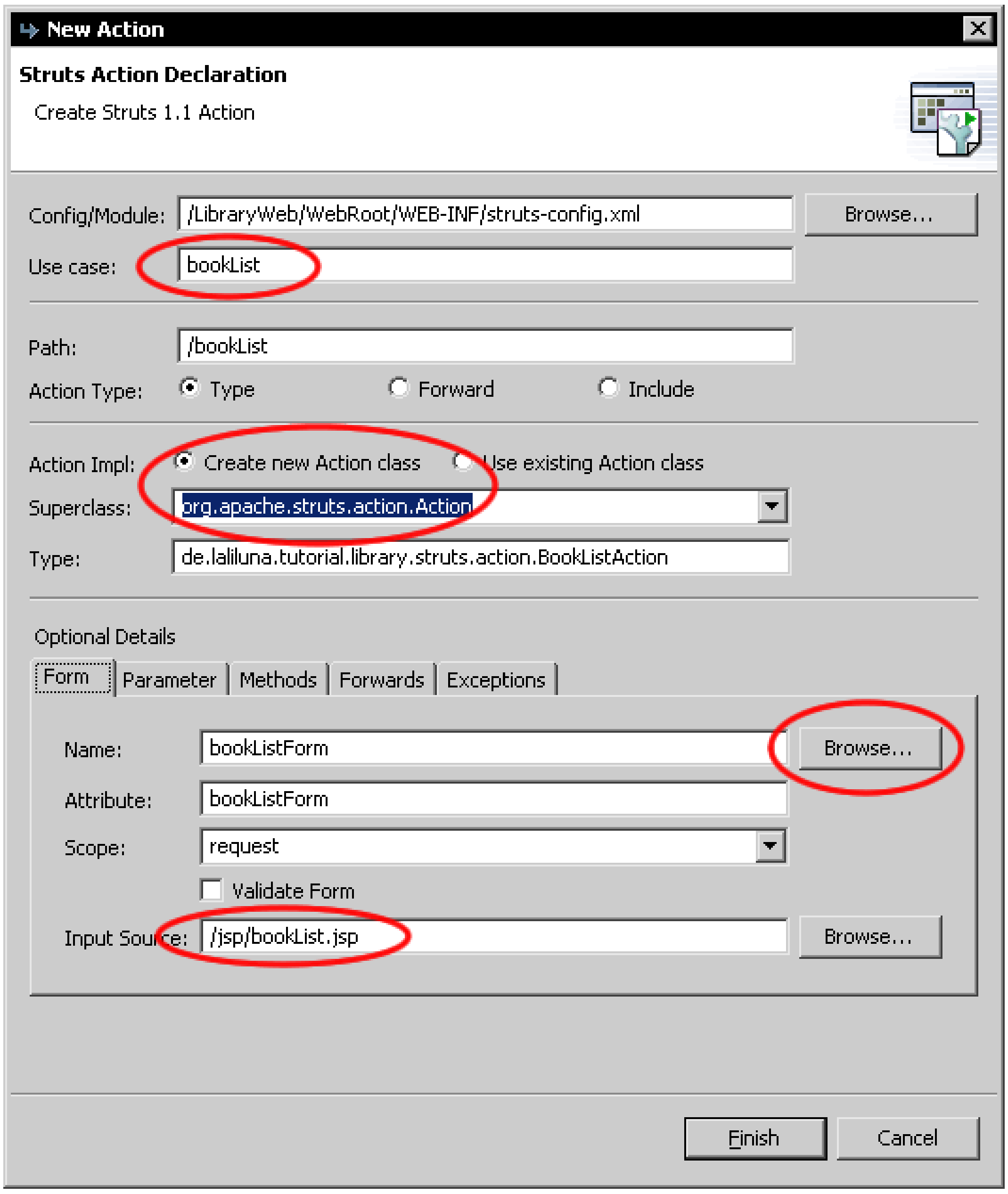
```
public class BookListForm extends ActionForm {

      private BookView[] bookViews = new BookView[0];

      public BookView[] getBookViews() {
            return bookViews;
      }
      public void setBookViews(BookView[] bookViews) {
            this.bookViews = bookViews;
      }
}
```

Define an array of type BookView and generate a getter and setter.

Action mapping und action class of the book list

Open the `struts-config.xml` and create a new action mapping.

`Use Case is bookList, choose Create new Action Class`
Superclass `org.apache.struts.Action`
On Optional Details choose the Form Bean `bookListForm`.
The input source is `/jsp/bookList.jsp`



New Action

Struts Action Declaration

Create Struts 1.1 Action

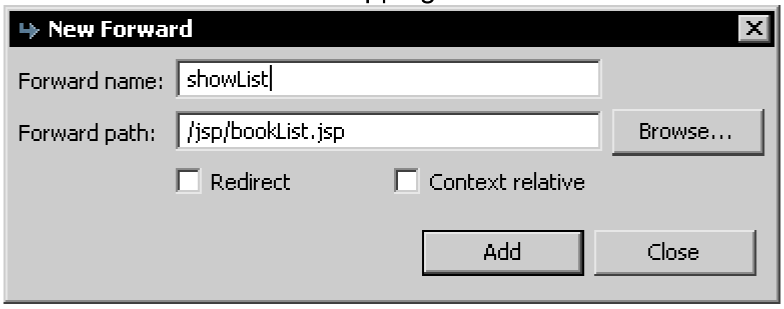
Config/Module:	/LibraryWeb/WebRoot/WEB-INF/struts-config.xml
Use case:	bookList
Path:	/bookList
Action Type:	[✓ Type] Forward Include
Action Impl:	[✓ Create new Action class] Use existing Action class
Superclass:	org.apache.struts.action.Action
Type:	de.laliluna.tutorial.library.struts.action.BookListAction

Optional Details

Form | Parameter | Methods | Forwards | Exceptions

Name:	bookListForm
Attribute:	bookListForm
Scope:	request
	☐ Validate Form
Input Source:	/jsp/bookList.jsp

Now add a forward `showList` to the action mapping.



New Forward

Forward name:	showList
Forward path:	/jsp/bookList.jsp
	☐ Redirect ☐ Context relative

You will find the action class `bookListAction` in your package `de.laliluna.tutorial.library.action`.

Edit the source code of the action class

Open the class `bookListAction` and edit the method `execute`. Create a local home interface of the class `BookSession` and call the method that gets all books. Save the array of books returned by the method in the form bean. The command `mapping.findForward („showList")` will search for a local forward with the name `showList`.

```
/**
 * Method execute
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
 public ActionForward execute(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookListForm bookListForm = (BookListForm) form;


   try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //lies alle Bücher aus und setze diese im Form Bean
            bookListForm.setBookViews(bookSession.getAllBooks());

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

    return mapping.findForward("showList");
 }
```

Yeah thats all, you have now created your form bean with an action form class, an action mapping with an action class and the jsp to display something.

Display the books list in the jsp file.

Open the `bookList.jsp` and add the following source code.

```
<%@ page language="java"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-bean" prefix="bean"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<html>
      <head>
            <title>Show book list</title>
      </head>
      <body>
      <table border="1">
      <tbody>
      <%-- set the header --%>
      <tr>
            <td>Author</td>
            <td>Book name</td>
            <td>Available</td>
            <td>Borrowed by</td>
            <td>&nbsp;</td>
            <td>&nbsp;</td>
            <td>&nbsp;</td>
      </tr>
      <%-- start with an iterate over the array bookViews --%>
      <logic:iterate name="bookListForm" property="bookViews" id="book">
      <tr>
            <%-- book informations --%>
            <td><bean:write name="book" property="author" /></td>
            <td><bean:write name="book" property="title" /></td>
            <td><html:checkbox disabled="true"
                                    name="book"
                                    property="available"/>
            </td>
            <td>
                  <%-- check if a user borrowed a book,
                       when its true display his name
                       otherwise display nothing --%>
                  <logic:notEmpty name="book" property="userView.name">
                        <bean:write name="book" property="userView.name" />,
                        <bean:write name="book" property="userView.lastName" />
                  </logic:notEmpty>
                  <logic:empty name="book" property="userView.name">
                        -
                  </logic:empty>
            </td>
            <%-- borrow, edit and delete link for each book --%>
            <td>
                  <%-- check if a user borrowed a book,
                       when its true display the return link
                       otherwise display the borrow link --%>
                  <logic:notEmpty name="book" property="userView.name">
                        <html:link action="bookEdit.do?do=returnBook"
                                    paramName="book"
                                    paramProperty="id"
                                    paramId="id">Return
book</html:link>
                  </logic:notEmpty>
                  <logic:empty name="book" property="userView.name">
                        <html:link action="bookEdit.do?do=borrowBook"
                                    paramName="book"
                                    paramProperty="id"
                                    paramId="id">Borrow
book</html:link>
                  </logic:empty>
            </td>
            <td><html:link action="bookEdit.do?do=editBook"
                              paramName="book"
                              paramProperty="id"
                              paramId="id">Edit</html:link>
            </td>
            <td><html:link action="bookEdit.do?do=deleteBook"
                              paramName="book"
                              paramProperty="id"
                              paramId="id">Delete</html:link>
            </td>
      </tr>
      </logic:iterate>
      <%-- end interate --%>

      <%-- if books cannot be found display a text --%>
      <logic:notPresent name="book">
            <tr>
                  <td colspan="5">No books found.</td>
            </tr>
      </logic:notPresent>

      </tbody>
      </table>

      <br>
      <%-- add and back to menu button --%>
      <html:button property="add"
                        onclick="location.href='bookEdit.do?do=addBook'">Add a 
new book
      </html:button>
      &nbsp;
      <html:button property="back"
                        onclick="location.href='default.do'">Back to menu
      </html:button>
      </body>
</html>
```

The tag `<logic:iterate>` loops over the array of books. Within the tag you have access to the properties of the books with the name book. The tag `<bean:write>` prints out a property of a book, for example the title. With the tag `<logic:notEmpty>` and `<logic:empty>` we check, if a user has borrowed a book or not.

Add, edit, borrow and delete books

In the next step we have to add the following use cases.

- Add books
- Edit books
- Borrow / return books
- Delete books

New form bean

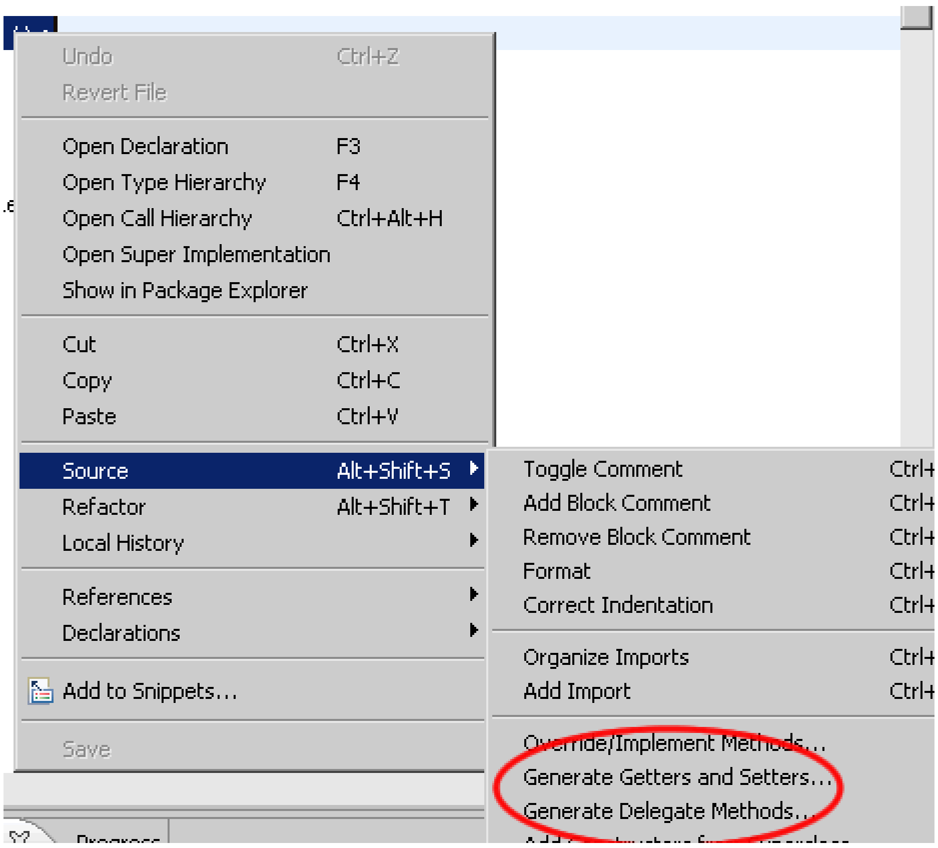
Create a new form bean and action form class. Set Use case to bookEdit and remove all methods on `Optional details – Methods`. Let MyEcplise create the jsp file for us.

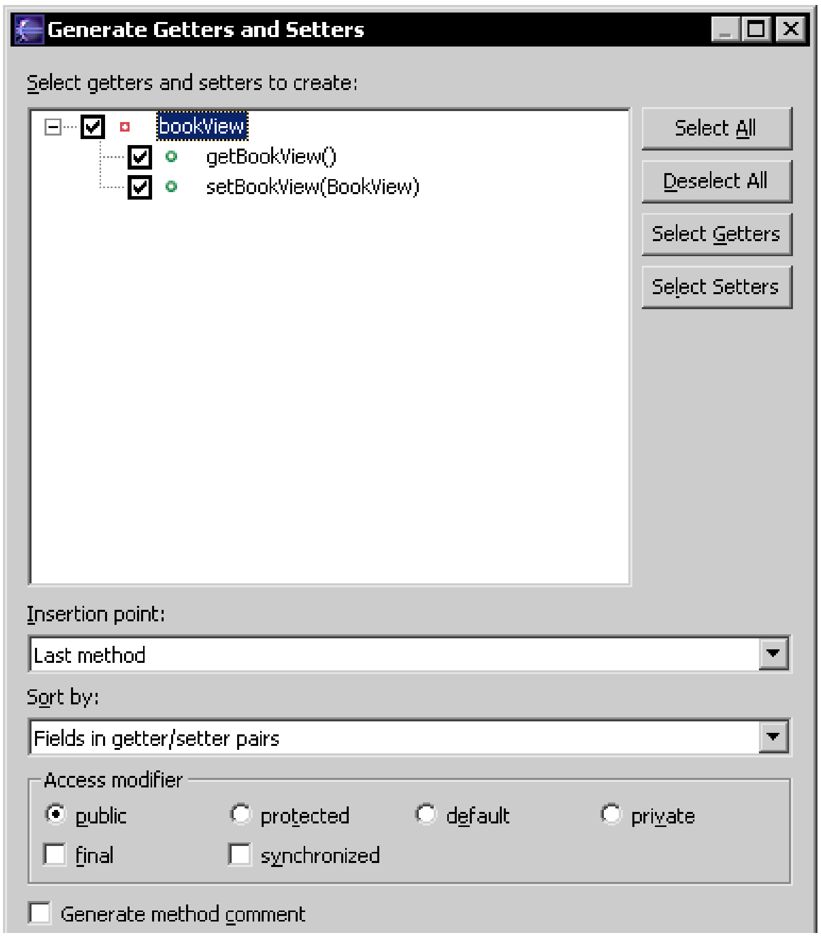
Open the class `BookEditForm.java` in `de.laliluna.tutorial.library.form`.

Create a new instance `bookView` of the class `BookView`

```
private BookView bookView = new BookView();
```

Generate a getter and setter for this instance.




Generate Getters and Setters

Select getters and setters to create:

- [✓] bookView
  - [✓] getBookView()
  - [✓] setBookView(BookView)

Insertion point: Last method

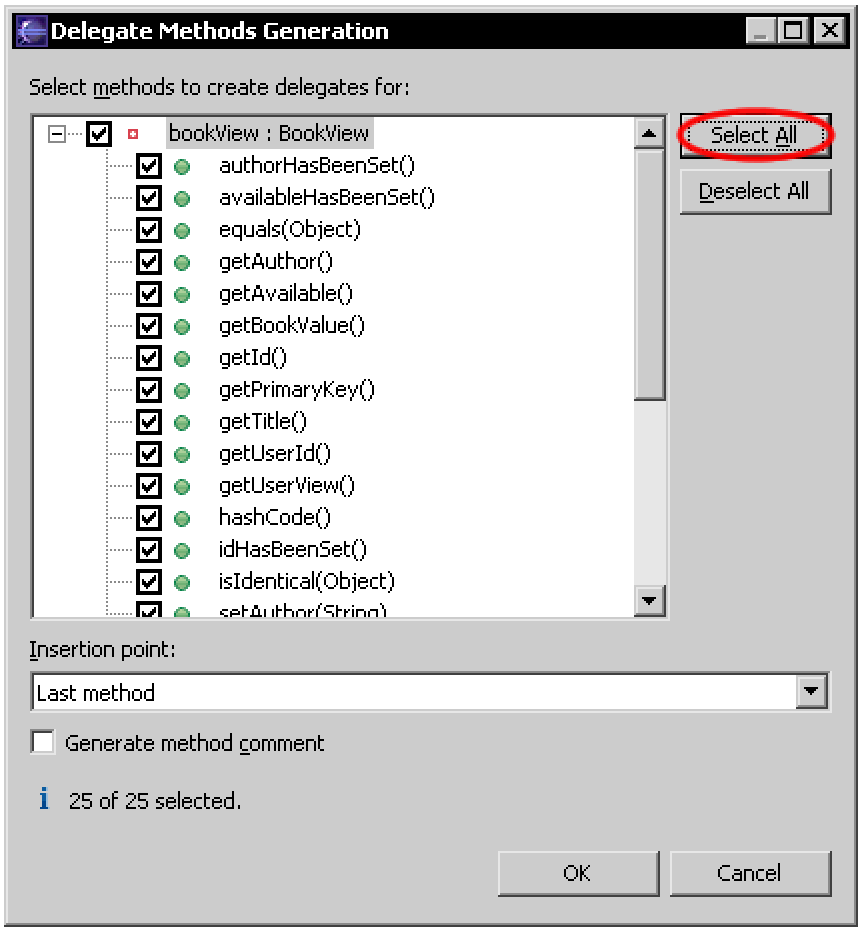
Sort by: Fields in getter/setter pairs

Access modifier: [✓ public] protected default private

[ ] final [ ] synchronized

[ ] Generate method comment

Delegate all methods of the class BookView.


Delegate Methods Generation
Select methods to create delegates for:
Select All
Deselect All
Insertion point:
Last method
OK
Cancel

Select methods to create delegates for:

```
[✓] bookView : BookView
    [✓] authorHasBeenSet()
    [✓] availableHasBeenSet()
    [✓] equals(Object)
    [✓] getAuthor()
    [✓] getAvailable()
    [✓] getBookValue()
    [✓] getId()
    [✓] getPrimaryKey()
    [✓] getTitle()
    [✓] getUserId()
    [✓] getUserView()
    [✓] hashCode()
    [✓] idHasBeenSet()
    [✓] isIdentical(Object)
    [✓] setAuthor(String)
```

Insertion point: Last method

[ ] Generate method comment

25 of 25 selected.

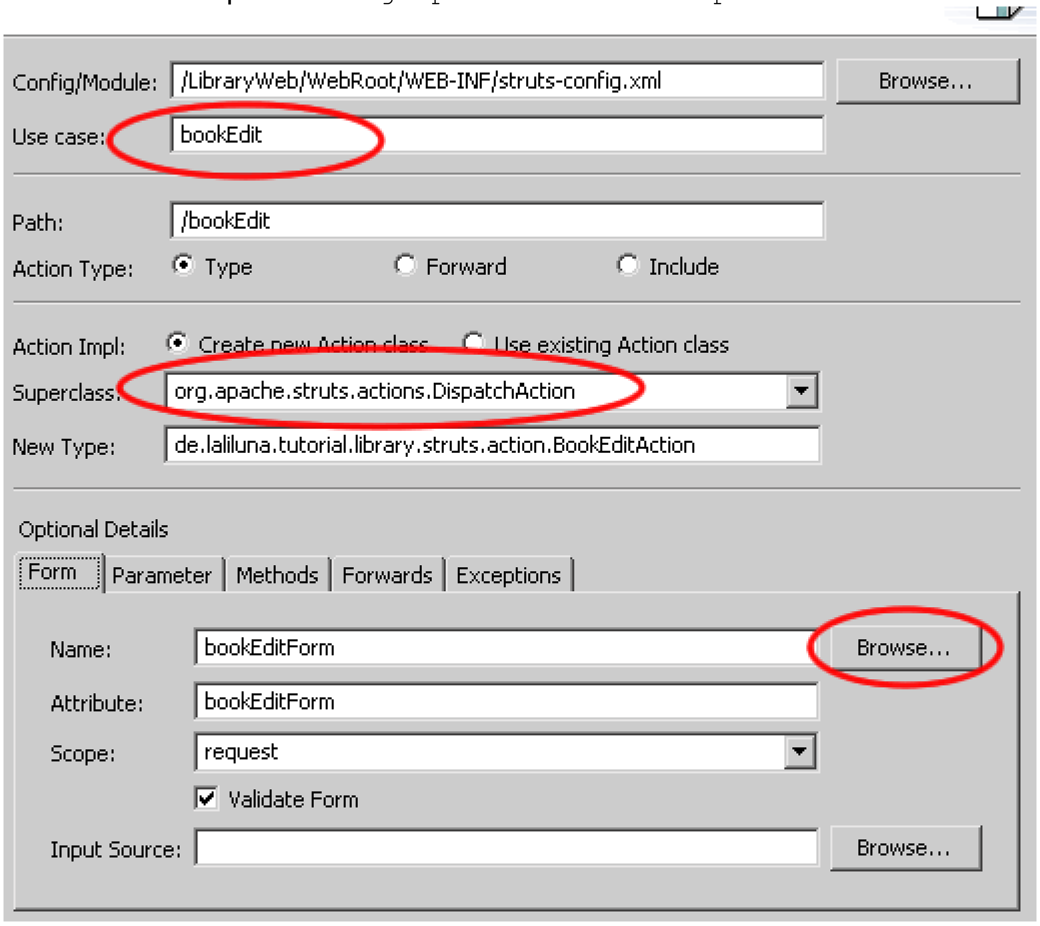
The source code looks like the following.

```
public class BookEditForm extends ActionForm {

      private BookView bookView = new BookView();

      public BookView getBookView() {
            return bookView;
      }
      public void setBookView(BookView bookView) {
            this.bookView = bookView;
      }
      public boolean authorHasBeenSet() {
            return bookView.authorHasBeenSet();
      }
      public boolean availableHasBeenSet() {
            return bookView.availableHasBeenSet();
      }
      public boolean equals(Object arg0) {
            return bookView.equals(arg0);
      }
      public String getAuthor() {
            return bookView.getAuthor();
      }
      public Boolean getAvailable() {
            return bookView.getAvailable();
      }
      public BookValue getBookValue() {
            return bookView.getBookValue();
      }
      public Integer getId() {
```

```
		return bookView.getId();
	}
	public Integer getPrimaryKey() {
		return bookView.getPrimaryKey();
	}
	public String getTitle() {
		return bookView.getTitle();
	}
	public Integer getUserId() {
		return bookView.getUserId();
	}
	public UserView getUserView() {
		return bookView.getUserView();
	}
	public int hashCode() {
		return bookView.hashCode();
	}
	public boolean idHasBeenSet() {
		return bookView.idHasBeenSet();
	}
	public boolean isIdentical(Object other) {
		return bookView.isIdentical(other);
	}
	public void setAuthor(String author) {
		bookView.setAuthor(author);
	}
	public void setAvailable(Boolean available) {
		bookView.setAvailable(available);
	}
	public void setBookValue(BookValue bookValue) {
		bookView.setBookValue(bookValue);
	}
	public void setId(Integer id) {
		bookView.setId(id);
	}
	public void setPrimaryKey(Integer pk) {
		bookView.setPrimaryKey(pk);
	}
	public void setTitle(String title) {
		bookView.setTitle(title);
	}
	public void setUserId(Integer userId) {
		bookView.setUserId(userId);
	}
	public void setUserView(UserView userView) {
		bookView.setUserView(userView);
	}
	public boolean titleHasBeenSet() {
		return bookView.titleHasBeenSet();
	}
	public String toString() {
		return bookView.toString();
	}
	public boolean userIdHasBeenSet() {
		return bookView.userIdHasBeenSet();
	}
}
```

Action Mapping

Create a new action mapping. There is a different between our first action class. The new action class will extends to the superclass `org.apache.struts.DispatchAction`.



Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: bookEdit

Path: /bookEdit

Action Type: [✓ Type] Forward Include

Action Impl: [✓ Create new Action class] Use existing Action class

Superclass: org.apache.struts.actions.DispatchAction

New Type: de.laliluna.tutorial.library.struts.action.BookEditAction

Optional Details

Form | Parameter | Methods | Forwards | Exceptions

Name: bookEditForm

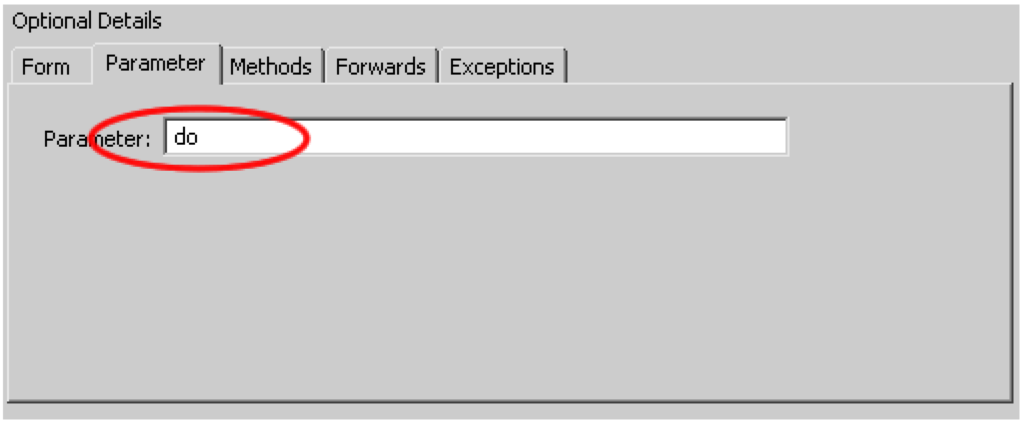
Attribute: bookEditForm

Scope: request

[✓] Validate Form

Input Source:

On Parameter we add a parameter `do`. These parameter is needed by the dispatch action class.

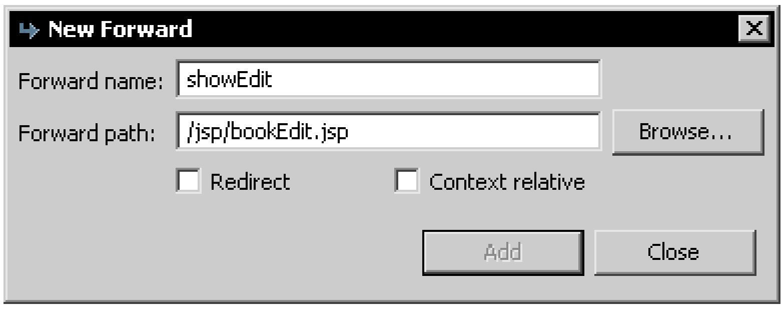


Optional Details

Form | Parameter | Methods | Forwards | Exceptions

Parameter: do

Add four new forwards. One is for the edit page, the second for the add page, where you can add the books, the third forward to the borrow page and the last forward redirect the user to the book listing.

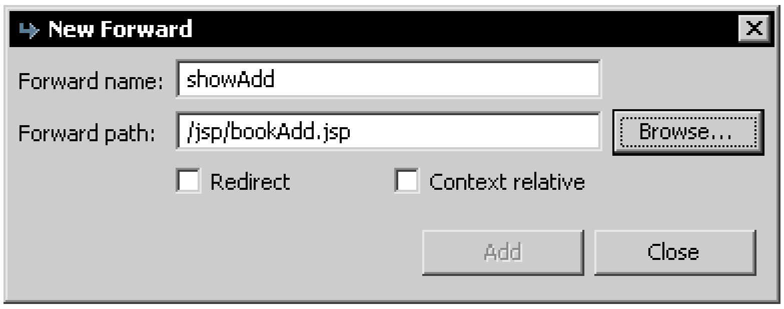


New Forward

Forward name: showEdit

Forward path: /jsp/bookEdit.jsp

☐ Redirect ☐ Context relative

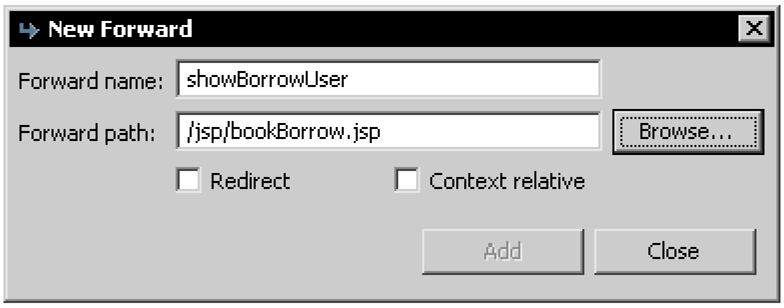


New Forward

Forward name: showAdd

Forward path: /jsp/bookAdd.jsp

☐ Redirect ☐ Context relative

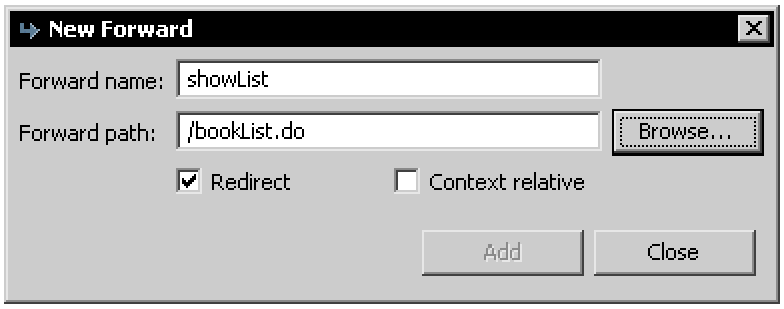


New Forward

Forward name: showBorrowUser

Forward path: /jsp/bookBorrow.jsp

☐ Redirect ☐ Context relative



New Forward

Forward name: showList

Forward path: /bookList.do

[✓ Redirect] ☐ Context relative

The last forward is different to the others. It refers to an existing action mapping and redirect the user.

Create the non existing jsp files with New > JSP.

```
bookAdd.jsp
bookBorrow.jsp
```

Create the source code of the jsp files

Open the file `bookAdd.jsp` and add the following source code.

```
<%@ page language="java"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-bean" prefix="bean"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<html>
      <head>
            <title>Add a book</title>
      </head>
      <body>
            <%-- create a html form --%>
            <html:form action="bookEdit">
                  <%-- print out the form data --%>
                  <table border="1">
                        <tbody>
                        <tr>
                              <td>Author:</td>
                              <td><html:text property="author" /></td>
                        </tr>
                        <tr>
                              <td>Title:</td>
                              <td><html:text property="title" /></td>
                        </tr>
                        <tr>
                              <td>Available:</td>
                              <td><html:checkbox property="available" /></td>
                        </tr>
                        </tbody>
                  </table>
                  <%-- set the parameter for the dispatch action --%>
                  <html:hidden property="do" value="saveBook" />

                  <br>
                  <%-- submit and back button --%>
                  <html:button property="back"
                               onclick="history.back();">
                               Back
                  </html:button>
                  &nbsp;
                  <html:submit>Save</html:submit>
            </html:form>


      </body>
</html>
```

The tag `<html:form>` creates a new HTML form and refers with the parameter `action=“bookEdit“` to the action mapping. The Tag `<html:text>` creates a text field with the property author of the book. `<html:hidden>` is a hidden form field with the name do. We need this hidden field, because it tells the dispatch action class which method will called.

Open the file `bookEdit.jsp`. You can use the source code of the of the file `bookAdd.jsp` and change the following lines.

```
<title>Edit a book</title>
```

`Add the following line above <html:hidden property="do" value="saveBook" />`

```
<%-- hidden fields for id and userId --%>
<html:hidden property="id" />
<html:hidden property="userId" />
```

Open the file `bookBorrow.jsp` and add the following.

```
<%@ page language="java"%>
<%@ page isELIgnored="false"%>

<%@ taglib uri="http://jakarta.apache.org/struts/tags-bean" prefix="bean"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<html>
      <head>
            <title>Show user</title>
      </head>
      <body>
      <html:form action="bookEdit">
      <table border="1">
      <tbody>
      <%-- set the header --%>
      <tr>
            <td>Last name</td>
            <td>Name</td>
            <td>Borrowed</td>
      </tr>

      <%-- start with an iterate over the collection users --%>
      <logic:iterate name="users" id="user">
      <tr>
            <%-- book informations --%>
            <td><bean:write name="user" property="lastName" /></td>
            <td><bean:write name="user" property="name" /></td>
            <td><html:radio property="userId" value="${user.id}" /></td>
      </tr>
      </logic:iterate>
      <%-- end interate --%>

      <%-- if users cannot be found display a text --%>
      <logic:notPresent name="user">
            <tr>
                  <td colspan="5">No users found.</td>
            </tr>
      </logic:notPresent>
      </tbody>
      </table>

      <%-- set the book id to borrow --%>
      <html:hidden property="id" />

      <%-- set the parameter for the dispatch action --%>
      <html:hidden property="do" value="save" />

      <%-- submit and back button --%>
      <html:button property="back"
                   onclick="history.back();">
                   Back
      </html:button>
      &nbsp;
      <html:submit>Save</html:submit>
      </html:form>
      </body>
</html>
```

Ok, thats all.

Methods of the dispatch action class

DispatchAction

Normally you set up each action event to always correspond to a unique Action class. There is nothing wrong with doing this but if you want to condense related events into one Action class you can do this by using a DispatchAction class or some of it sub classes.

Open the file `bookEditAction.java` and add the following methods

```
public ActionForward editBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      /* lalinuna.de 04.11.2004
       * get id of the book from request
       */
      Integer id = Integer.valueOf(request.getParameter("id"));

      /* lalinuna.de 16.11.2004
       * load the session facade and get the book by primary key
       */
      try {
            InitialContext context = new InitialContext();
            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //bestimme das Buch anhand seines Primärschlüssels und setzte es im 
Form Bean
            bookEditForm.setBookValue(bookSession.getBookByPrimaryKey(id));

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showEdit");

}
```

The method `editBook` gets the `id` from the `request` and gets the book by the primary key from the database. The forward `showEdit` refers to the jsp file where you can edit the book.

```
public ActionForward borrowBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      /* lalinuna.de 04.11.2004
       * get id of the book from request
       */
      Integer id = Integer.valueOf(request.getParameter("id"));

      /* lalinuna.de 16.11.2004
       * load the session facade for book and user
       * get the book information and get all users
       */
      try {
            InitialContext context = new InitialContext();
            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();;

            //holen des Home Interfaces für UserSession mit JNDI vom 
Appplication Server
            UserSessionHome userSessionHome = (UserSessionHome)context.lookup
(UserSessionHome.JNDI_NAME);
            UserSession userSession = userSessionHome.create();

            //lies das Buch anhand seines Primärschlüssels und setzte es im Form
Bean
            bookEditForm.setBookView(bookSession.getBookByPrimaryKey(id));

            //bestimme alle Benutzer und setzte diese im Request
            request.setAttribute("users", userSession.getAllUsers());

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showBorrowUser");
}
```

The method contains the process that a user can borrow a book. It assigns a user to a book.

```
public ActionForward returnBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      /* lalinuna.de 04.11.2004
       * get id of the book from request
       */
      Integer id = Integer.valueOf(request.getParameter("id"));

      /* lalinuna.de 16.11.2004
       * load the session facade and delete the book by primary key
       */
      try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //löscht die Beziehung zwischen Benutzer und Buch
            bookSession.returnBook(id);


      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showList");
}
```
The next method removes the relation between a user and a book, the book is returned by a user.

```

public ActionForward deleteBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      /* lalinuna.de 04.11.2004
       * get id of the book from request
       */
      Integer id = Integer.valueOf(request.getParameter("id"));

      /* lalinuna.de 16.11.2004
       * load the session facade and delete the book by primary key
       */
      try {
            InitialContext context = new InitialContext();
            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //löscht eine Buch anhand des Primärschlüssels
            bookSession.removeBookByPrimaryKey(id);


      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showList");
}
```

The method `deleteBook` gets the parameter `id` of the `request` and deletes the book from the database. Then the forward `showList` displays the book list page.

```
public ActionForward addBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      return mapping.findForward("showAdd");

}
```
The method `addBook` refers to the `bookAdd.jsp`

```
public ActionForward saveBorrow(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;

      /* lalinuna.de 16.11.2004
       * load the session facade and save the book by primary key
       */
      try {
            InitialContext context = new InitialContext();
            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //ein Buch an einen Benutzer verleihen
            bookSession.borrowBook(bookEditForm.getId(), bookEditForm.getUserId
());

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showList");
}
```

This method assigns a user to a book, if a user borrows a book.

```
public ActionForward saveBook(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      BookEditForm bookEditForm = (BookEditForm) form;


      /* lalinuna.de 16.11.2004
       * load the session facade and save the book by primary key
       */
      try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            BookSessionHome bookSessionHome = (BookSessionHome)context.lookup
(BookSessionHome.JNDI_NAME);
            BookSession bookSession = bookSessionHome.create();

            //speichern des Book Value Ojekts
            bookSession.saveBook(bookEditForm.getBookValue());


      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showList");
}
```

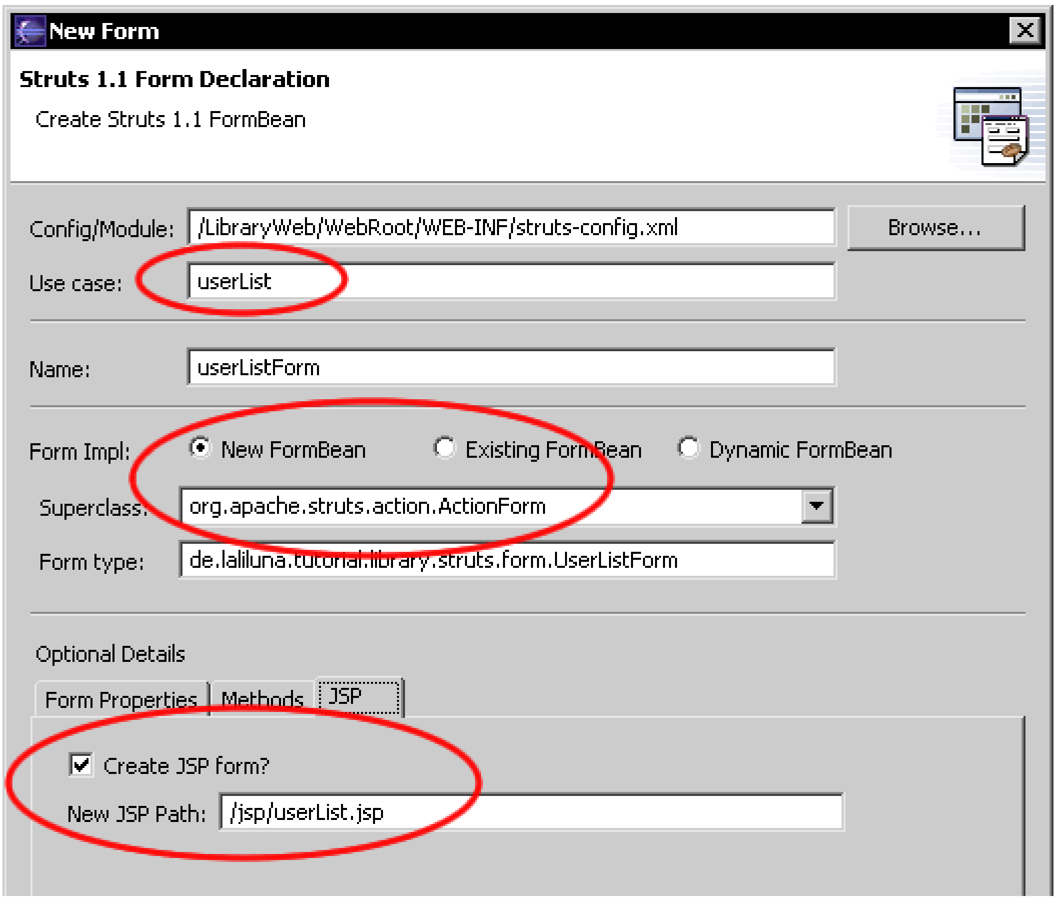
The last method updates a book.

User list

We create this list on the same way like the book list.

Open the `struts-config.xml`. Right click on `Form Bean` in the outline window.

Use Case is `userList`, Superclass `org.apache.struts.ActionForm` On Methods choose only `public void reset`. On JSP set a name for the jsp file.


New Form

Struts 1.1 Form Declaration

Create Struts 1.1 FormBean

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: userList

Name: userListForm

Form Impl: [✓ New FormBean] Existing FormBean Dynamic FormBean

Superclass: org.apache.struts.action.ActionForm

Form type: de.laliluna.tutorial.library.struts.form.UserListForm

Optional Details

Form Properties | Methods | JSP

☑ Create JSP form?

New JSP Path: /jsp/userList.jsp

Edit the source code of the action class

Open the file `UserListForm.java` and add the following source code.

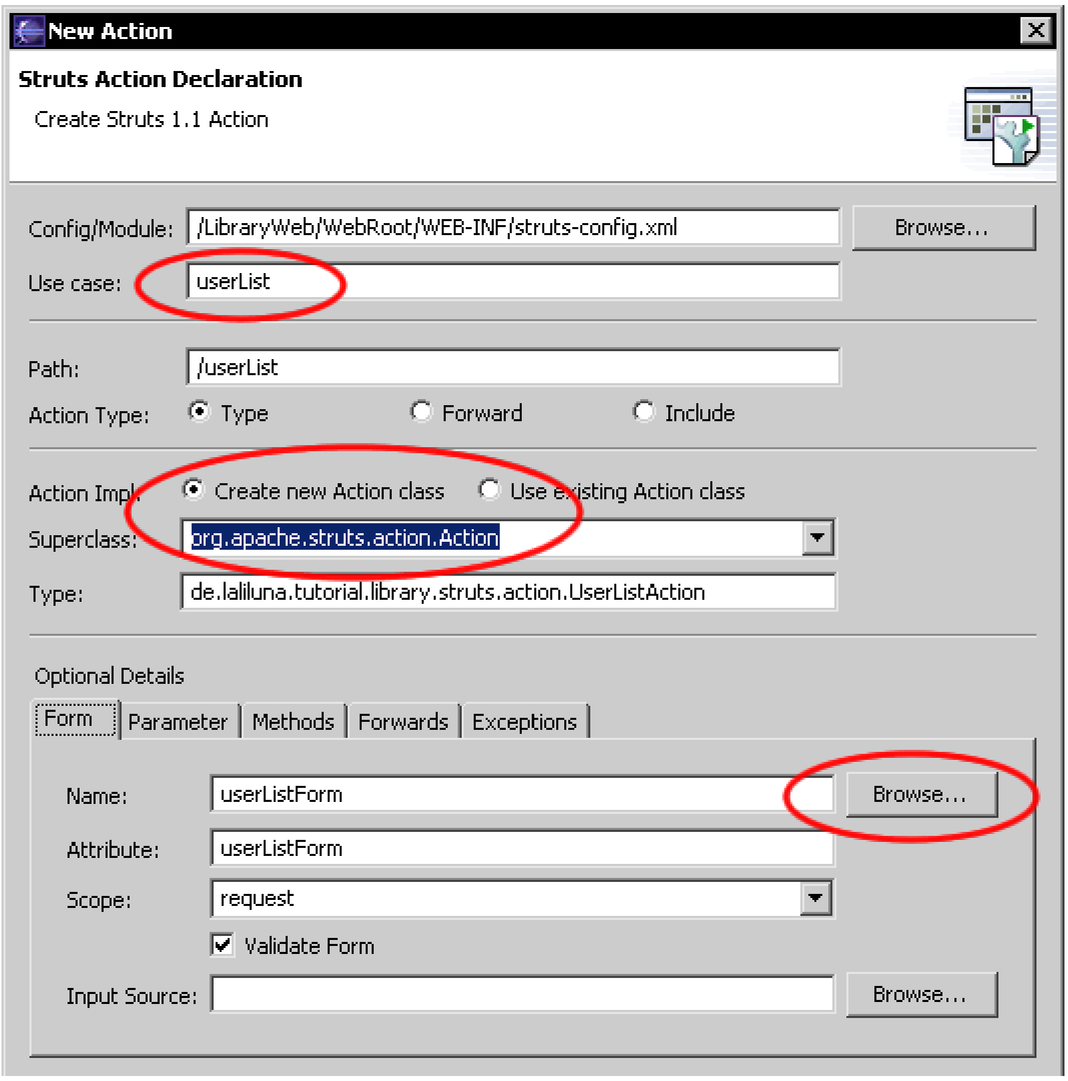
```
public class UserListForm extends ActionForm {

      private Collection users;

      /* lalinuna.de 02.11.2004
       * get the collection books
       */
       public Collection getUsers() {
             return users;
        }
      /* lalinuna.de 02.11.2004
       * set the collection books
       */
       public void setUsers(Collection users) {
             this.users = users;
       }

      /* lalinuna.de 02.11.2004
       * reset the collection books
       */
       public void reset(ActionMapping arg0, HttpServletRequest arg1) {
             users = new ArrayList();
       }

}
```

We define a collection `users` and generate a getter and setter. Within the method `reset` we initialize the collection as a new array list.

Action mapping and action class for the user list

Open the struts-config.xml and create a new action mapping.

Use Case `userList`, choose `Create new Action Class`
Superclass `org.apache.struts.Action`
Choose on Optional Details the form bean `userListForm` and on Input Source the jsp file `/jsp/userList.jsp`



New Action

Struts Action Declaration

Create Struts 1.1 Action

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: userList

Path: /userList

Action Type: [✓ Type] Forward Include

Action Impl: [✓ Create new Action class] Use existing Action class

Superclass: org.apache.struts.action.Action

Type: de.laliluna.tutorial.library.struts.action.UserListAction

Optional Details

Form | Parameter | Methods | Forwards | Exceptions

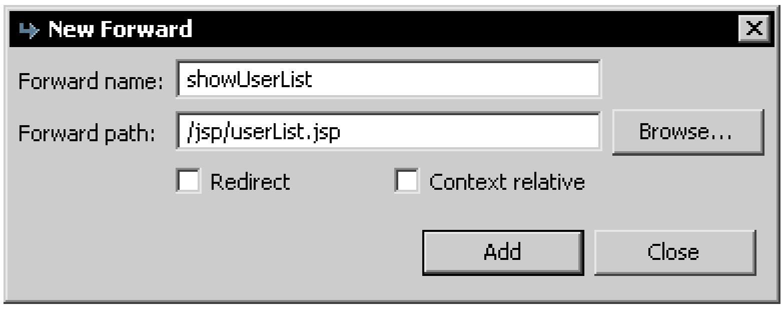
Name: userListForm

Attribute: userListForm

Scope: request

[✓] Validate Form

Input Source:



New Forward

Forward name: showUserList

Forward path: /jsp/userList.jsp

[ ] Redirect [ ] Context relative

Add Close

Edit the action class

Open the file `UserListAction.java` and add the following source code.

```
/**
 * Method execute
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
public ActionForward execute(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      UserListForm userListForm = (UserListForm) form;


      /* lalinuna.de 16.11.2004
       * load the session facade and get all users
       */
      try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für BookSession mit JNDI vom 
Appplication Server
            UserSessionHome userSessionHome = (UserSessionHome)context.lookup
(UserSessionHome.JNDI_NAME);
            UserSession userSession = userSessionHome.create();

            //lies alle Benutzer aus und setze diese im form bean
            userListForm.setUsers(userSession.getAllUsers());

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

    return mapping.findForward("showUserList");
}
```
The method gets all users and set them in the form bean.

Displaying the book list in the jsp file

Open the jsp file `userList.jsp` and change the content of the file like the following.

```
<%@ page language="java"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-bean" prefix="bean"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<html>
      <head>
            <title>Show user list</title>
      </head>
      <body>

      <table border="1">
      <tbody>
      <%-- set the header --%>
      <tr>
            <td>Last name</td>
            <td>Name</td>
            <td>Age</td>
            <td>&nbsp;</td>
            <td>&nbsp;</td>
      </tr>
      <%-- start with an iterate over the collection users --%>
      <logic:iterate name="userListForm" property="users" id="user">
      <tr>
```

```
            <%-- book informations --%>
            <td><bean:write name="user" property="lastName" /></td>
            <td><bean:write name="user" property="name" /></td>
            <td><bean:write name="user" property="age" /></td>

            <%-- edit and delete link for each book --%>
            <td><html:link action="userEdit.do?do=editUser"
                                 paramName="user"
                                 paramProperty="id"
                                 paramId="id">Edit</html:link>
            </td>
            <td><html:link action="userEdit.do?do=deleteUser"
                                 paramName="user"
                                 paramProperty="id"
                                 paramId="id">Delete</html:link>
            </td>
      </tr>
      </logic:iterate>
      <%-- end interate --%>

      <%-- if users cannot be found display a text --%>
      <logic:notPresent name="user">
            <tr>
                  <td colspan="5">No users found.</td>
            </tr>
      </logic:notPresent>

      </tbody>
      </table>

      <br>
      <%-- add and back to menu button --%>
      <html:button property="add"
                        onclick="location.href='userEdit.do?do=addUser'">Add a
new user
      </html:button>
      &nbsp;
      <html:button property="back"
                        onclick="location.href='default.do'">Back to menu
      </html:button>
      </body>
</html>
```

Add, edit, delete users

In the next step we want to add the following use cases.

- Add a user
- Edit a user
- Delete User

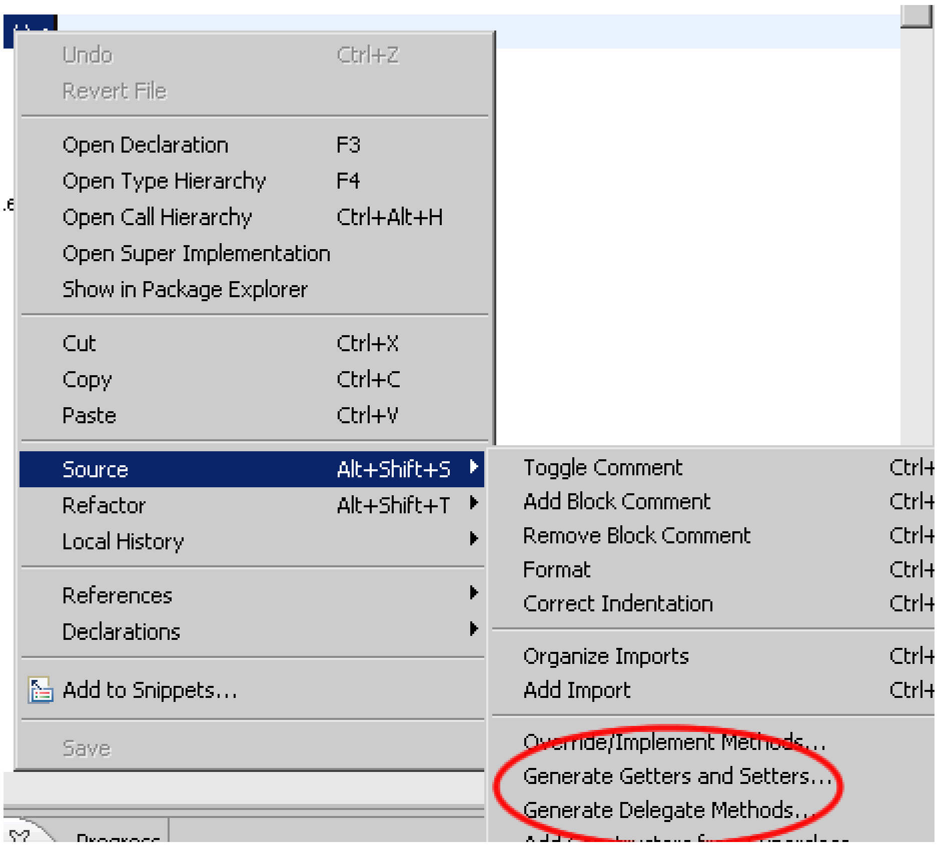
New form bean

Add a new form bean, with an action form class. Set the Use case `userEdit`. Choose on `Optional details – Methods` no methods. On JSP select that the jsp file will be created.

Open the class `UserEditForm.java` on `de.laliluna.tutorial.library.form`.
Add a new instance of `userView` of the class `UserView`.

```
private UserView userView = new UserView();
```

Generate a getter- and setter-method and delegate all methods of the class, like you have done it with the book form bean.



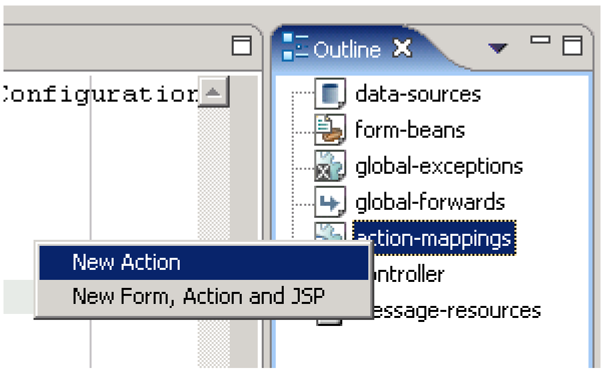
The source code of the class looks like the following

```
public class UserEditForm extends ActionForm {

      private UserView userView = new UserView();

      public UserView getUserView() {
            return userView;
      }
      public void setUserView(UserView userView) {
            this.userView = userView;
      }
      public boolean ageHasBeenSet() {
            return userView.ageHasBeenSet();
```

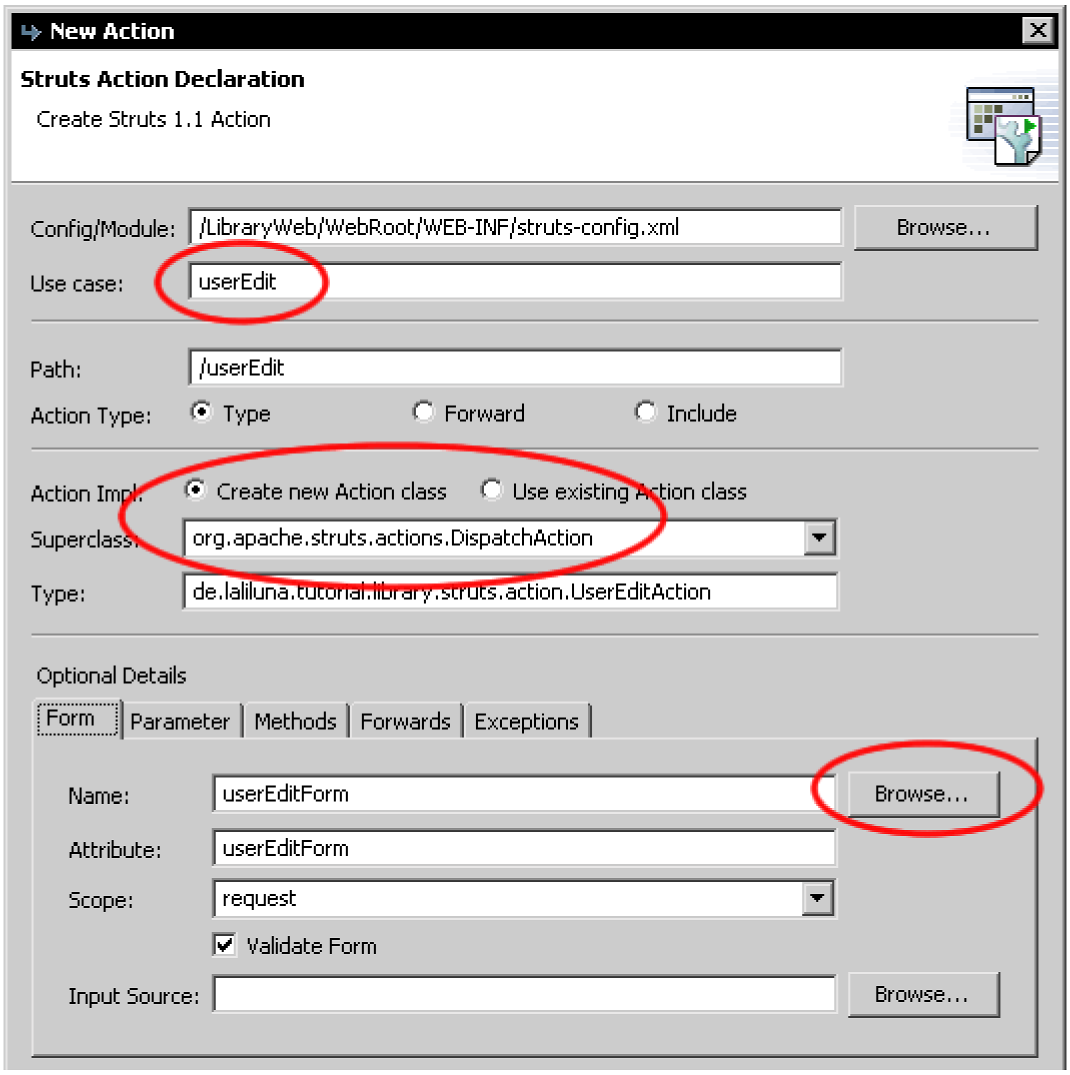
```
	}
	public boolean equals(Object arg0) {
		return userView.equals(arg0);
	}
	public Integer getAge() {
		return userView.getAge();
	}
	public Integer getId() {
		return userView.getId();
	}
	public String getLastName() {
		return userView.getLastName();
	}
	public String getName() {
		return userView.getName();
	}
	public Integer getPrimaryKey() {
		return userView.getPrimaryKey();
	}
	public UserValue getUserValue() {
		return userView.getUserValue();
	}
	public int hashCode() {
		return userView.hashCode();
	}
	public boolean idHasBeenSet() {
		return userView.idHasBeenSet();
	}
	public boolean isIdentical(Object other) {
		return userView.isIdentical(other);
	}
	public boolean lastNameHasBeenSet() {
		return userView.lastNameHasBeenSet();
	}
	public boolean nameHasBeenSet() {
		return userView.nameHasBeenSet();
	}
	public void setAge(Integer age) {
		userView.setAge(age);
	}
	public void setId(Integer id) {
		userView.setId(id);
	}
	public void setLastName(String lastName) {
		userView.setLastName(lastName);
	}
	public void setName(String name) {
		userView.setName(name);
	}
	public void setPrimaryKey(Integer pk) {
		userView.setPrimaryKey(pk);
	}
	public void setUserValue(UserValue userValue) {
		userView.setUserValue(userValue);
	}
	public String toString() {
		return userView.toString();
	}
}
```

Action Mapping und Action Klasse

Open the `struts-config.xml` and create a new action mapping.



Set the Use case to `userEdit`. Choose Create new Action class and on Superclass `org.apache.struts.actions.DispatchAction`. On Optional Details > Form choose the form bean.



New Action

Struts Action Declaration

Create Struts 1.1 Action

Config/Module: /LibraryWeb/WebRoot/WEB-INF/struts-config.xml

Use case: userEdit

Path: /userEdit

Action Type: [✓ Type] Forward Include

Action Impl: [✓ Create new Action class] Use existing Action class

Superclass: org.apache.struts.actions.DispatchAction

Type: de.laliluna.tutorial.library.struts.action.UserEditAction

Optional Details

Form | Parameter | Methods | Forwards | Exceptions

Name: userEditForm

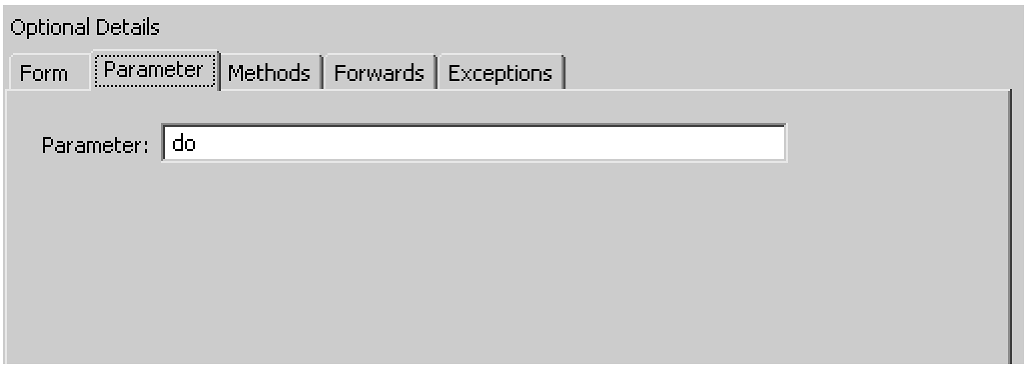
Attribute: userEditForm

Scope: request

[✓] Validate Form

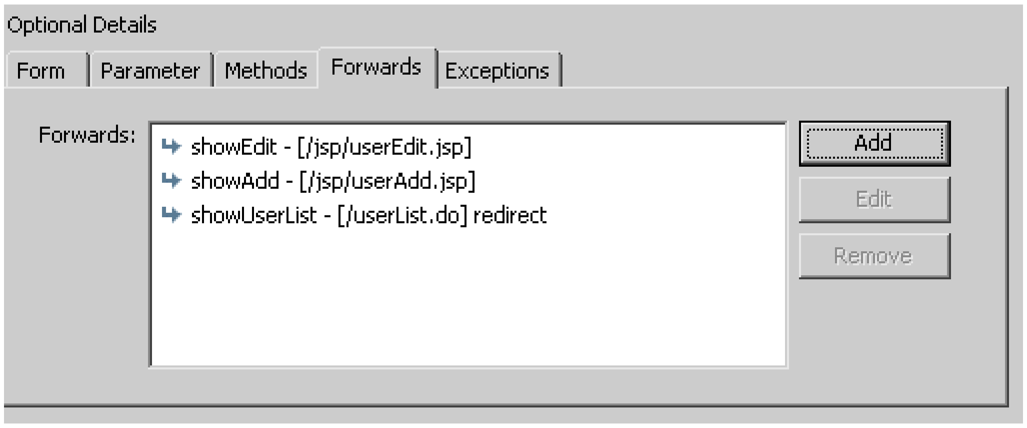
Input Source:

Set the parameter on Option Details to `do`.



Parameter: do

At the end add three forwards to the different pages.



Forwards:
showEdit - [/jsp/userEdit.jsp]
showAdd - [/jsp/userAdd.jsp]
showUserList - [/userList.do] redirect

Edit the source code of the action class

Open the class `UserEditAction.java` in the package `de.laliluna.tutorial.library.action` and add the following methods.

```
/**
 * Method editBook
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
public ActionForward editUser(
 ActionMapping mapping,
 ActionForm form,
 HttpServletRequest request,
 HttpServletResponse response) {
 UserEditForm userEditForm = (UserEditForm) form;

 /* lalinuna.de 04.11.2004
 * get id of the book from request
 */
 Integer id = Integer.valueOf(request.getParameter("id"));

 /* lalinuna.de 16.11.2004
 * load the session facade and get the book by primary key
 */
 try {
 InitialContext context = new InitialContext();

 //holen des Home Interfaces für UserSession mit JNDI vom Appplication Server
```

```
            UserSessionHome userSessionHome = (UserSessionHome)context.lookup
(UserSessionHome.JNDI_NAME);
            UserSession userSession = userSessionHome.create();

            //bestimmen eines Benutzers anhand seines Primärschlüssels und
setzen im Form Bean
            userEditForm.setUserValue(userSession.getUserByPrimaryKey(id));

      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showEdit");
}
```

This method gets a user by his primary key and save them in the form bean.

```
/**
 * Method deleteBook
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
public ActionForward deleteUser(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      UserEditForm userEditForm = (UserEditForm) form;

      /* lalinuna.de 04.11.2004
       * get id of the book from request
       */
      Integer id = Integer.valueOf(request.getParameter("id"));

      /* lalinuna.de 16.11.2004
       * load the session facade and delete the user by primary key
       */
      try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für UserSession mit JNDI vom
Appplication Server
            UserSessionHome userSessionHome = (UserSessionHome)context.lookup
(UserSessionHome.JNDI_NAME);
                  UserSession userSession = userSessionHome.create();

            //löschen eine Benutzer anhand seines Primärschlüssels
            userSession.removeUserByPrimaryKey(id);


      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showUserList");
}
```

The next method deletes a user by primary key and forwards to the user list page.

```
/**
 * Method addBook
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
public ActionForward addUser(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      UserEditForm userEditForm = (UserEditForm) form;

      return mapping.findForward("showAdd");

}
```

This method forwards to the add dialog

```
/**
 * Method saveBook
 * @param mapping
 * @param form
 * @param request
 * @param response
 * @return ActionForward
 */
public ActionForward saveUser(
      ActionMapping mapping,
      ActionForm form,
      HttpServletRequest request,
      HttpServletResponse response) {
      UserEditForm userEditForm = (UserEditForm) form;

      /* lalinuna.de 16.11.2004
       * load the session facade and save the book by primary key
       */
      try {
            InitialContext context = new InitialContext();

            //holen des Home Interfaces für UserSession mit JNDI vom
Appplication Server
            UserSessionHome userSessionHome = (UserSessionHome)context.lookup
(UserSessionHome.JNDI_NAME);
            UserSession userSession = userSessionHome.create();

            //aktualisiert oder legt eine neues Buch an
            userSession.saveUser(userEditForm.getUserValue());


      } catch (RemoteException e) {
            e.printStackTrace();
      } catch (NamingException e) {
            e.printStackTrace();
      } catch (CreateException e) {
            e.printStackTrace();
      }

      return mapping.findForward("showUserList");
}
```

This method updates and adds a user, like the method in the book action class. It forwards to the user list page.

Edit the source code of the jsp files

Create a new file named `userAdd.jsp` in the folder `WebRoot/jsp/`.

Open the file `userAdd.jsp` and change the content of the file.

```
<%@ page language="java"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-bean" prefix="bean"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-html" prefix="html"%>
<%@ taglib uri="http://jakarta.apache.org/struts/tags-logic" prefix="logic" %>

<html>
      <head>
            <title>Add a user</title>
      </head>
      <body>
            <%-- create a html form --%>
            <html:form action="userEdit">
                  <%-- print out the form data --%>
                  <table border="1">
                        <tbody>
                        <tr>
                              <td>Last name:</td>
                              <td><html:text property="lastName" /></td>
                        </tr>
                        <tr>
                              <td>Name:</td>
                              <td><html:text property="name" /></td>
                        </tr>
                        <tr>
                              <td>Age:</td>
                              <td><html:text property="age" /></td>
                        </tr>
                        </tbody>
                  </table>
                  <%-- set the parameter for the dispatch action --%>
                  <html:hidden property="do" value="saveUser" />

                  <br>
                  <%-- submit and back button --%>
                  <html:button property="back"
                                    onclick="history.back();">
                                    Back
                  </html:button>
                  &nbsp;
                  <html:submit>Save</html:submit>
            </html:form>
      </body>
</html>
```

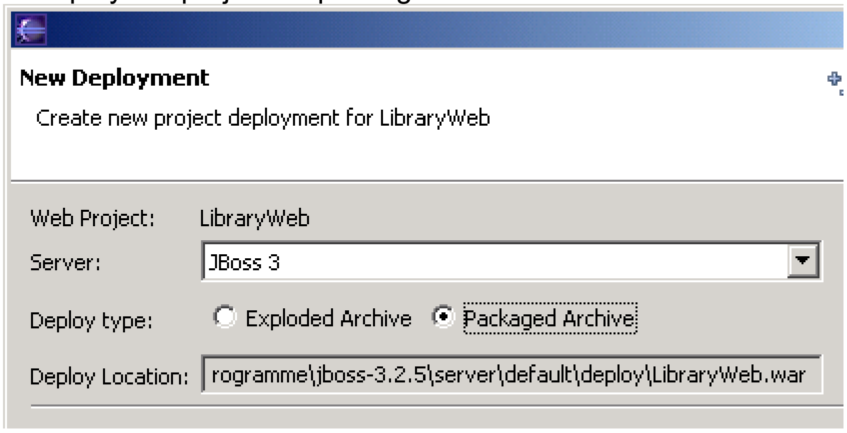
It is quite the same like the book edit page.

Open the file `userEdit.jsp` copy the source code of the file `userAdd.jsp` and add above the line `<html:hidden property="do" value="saveUser" />` the following

```
<%-- hidden field that contains the id of the user --%>
<html:hidden property="id" />
```

Test the applications

Start the jboss and deploy the project as package archiv.



New Deployment

Create new project deployment for LibraryWeb

Web Project: LibraryWeb

Server: JBoss 3

Deploy type: Exploded Archive [✓ Packaged Archive]

Deploy Location: rogramme\jboss-3.2.5\server\default\deploy\LibraryWeb.war

Call the project in your favorite web browser. http://localhost:8080/LibraryWeb/

Nice, thats all.