MVC and Struts
A better way to structure web applications
Why do we need MVC?

What if we need another step?
Why do we need MVC?

Who manages the database? Too many connections
How Struts Fits In

- Implements the “control” layer
- Provides tools for “view” and “model”
- Declarative programming

<table>
<thead>
<tr>
<th>View</th>
<th>Taglibs, Tiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>ActionServlet</td>
</tr>
<tr>
<td>Model</td>
<td>Actions, Form Beans</td>
</tr>
</tbody>
</table>

and validation, internationalization, exceptions, etc...
Components of Struts

- Action Servlet
- Actions
- Form Beans
- Message Resources
- Taglibs

And some more...

```
<web-app>
  <servlet>
    <servlet-name>ExampleServlet</servlet-name>
    <servlet-class>com.example.MyServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>ExampleServlet</servlet-name>
    <url-pattern>/my-servlet</url-pattern>
  </servlet-mapping>
</web-app>
```

```
<struts-config>
  <action>
    <form-bean>
      <message-resources>
        <global-exceptions>
          <plug-in>
        </plug-in>
      </message-resources>
    </form-bean>
  </action>
</struts-config>
```
Actions

HTTP Request /app/action.do

Tomcat

web.xml

*.do?

Action Servlet

struts config

Action

Beans/classes

JSP

Forward

Redirect

Forward

DB
Form Beans

- Basically a Java-Bean
- Empty constructor
- Private attributes
- Getters / setters
- Represent HTML form
- Validation

```
firstName
setFirstName()
gFirstName()

lastName
setLastName()
gLastName()

firstName.length == 0?
errors.add()
```
Tag Libraries

- Java classes in special format
- Methods invoked with XML tags
- Hide Java from JSPs

1. Declare
   ```xml
   <taglib>
     uri
     location
   </taglib>
   ```
   web.xml

2. Import
   ```jsp
   <%@ taglib uri="/tags/struts-html" prefix="html" %>
   ```
   page.jsp

3. Use
   ```jsp
   <html:base />
   <html:form action="/action" method="POST">
     <html:text property="firstName" />
   </html:form>
   ```
   page.jsp

It's XML, remember to always close them />
## Tag Libraries

<table>
<thead>
<tr>
<th>html</th>
<th>Generate HTML dynamically</th>
</tr>
</thead>
<tbody>
<tr>
<td>bean</td>
<td>Define beans, print their properties</td>
</tr>
<tr>
<td></td>
<td>Print localized strings</td>
</tr>
<tr>
<td></td>
<td>Some equivalent to JSP taglib</td>
</tr>
<tr>
<td>logic</td>
<td>Manage conditionals, iterations, flow control</td>
</tr>
</tbody>
</table>
Validation

- Done in Form Bean
- Display errors near form
- Forms pre-filled
- Internationalization

```
<html:form>
  form.jsp
  validate()
  errors?
</html:form>

Action Servlet
Get/Post

Form Bean
validate()
validate()

Action
Message Resources

Resources
```
Example

fSurvey.jsp

<form>
name, age,
...
</form>

/demoStruts/rSurvey.do

SurveyForm

RegisterSurveyAction

forward

<html>
display info
</html>
dSurvey.jsp
Need Help?

- **Struts Documentation**
  http://struts.apache.org/struts-doc-1.2.x/userGuide/

- **Servlets Documentation (API)**
  http://java.sun.com/products/servlet/2.3/javadoc/

- **Java Documentation (API)**
  http://java.sun.com/j2se/1.5.0/docs/api/

*Please use them...*