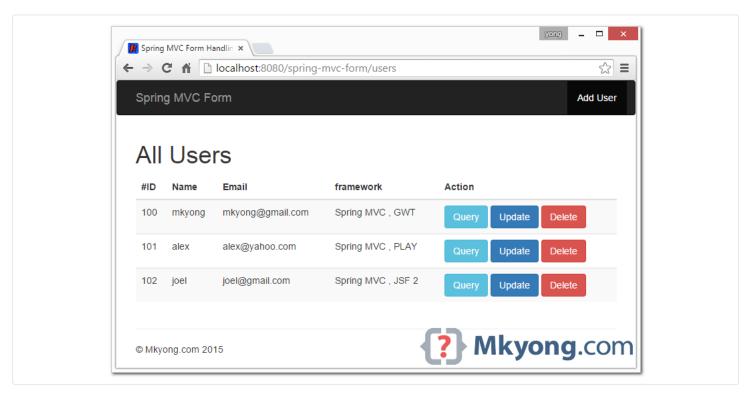
# Spring MVC form handling example

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In this tutorial, we will show you a Spring MVC form handling project to do the following stuff:

- 1. Form value binding JSP and Model.
- 2. Form validation and display error message.
- 3. Form POST/REDIRECT/GET pattern, and add messages to flash attribute.
- 4. CRUD operations, add, get, update and delete with an HTML form.

## Technologies used:

- 1. Spring 4.1.6.RELEASE
- 2. Maven 3
- 3. Bootstrap 3
- 4. HSQLDB driver 2.3.2
- 5. Logback 1.1.3
- 6. JDK 1.7
- 7. JSTL 1.2
- 8. Eclipse IDE

### What you'll build:

A simple user management project, you can list, create, update and delete an user, via HTML forms. You'll also see how to perform the form validation and display the error message conditionally. This project is styling with Bootstrap 3, and data are stored in the HSQL embedded database.

### The URI structure:

URI	Method	Action
/users	GET	Listing, display all users
/users	POST	Save or update user
/users/{id}	GET	Display user {id}
/users/add	GET	Display add user form

/users/{id}/update	GET	Display update user form for {id}
/users/{id}/delete	POST	Delete user {id}

#### Note

In the old days, before Spring 3.0, we use  ${\tt SimpleFormController}$ 

(http://docs.spring.io/spring/docs/3.0.x/api/org/springframework/web/portlet/mvc/SimpleFormController.htm10) do the form handling. As Spring 3.0, this class is deprecated in favor of Spring annotated @Controller.

## Spring MVC Form Binding

Before you start the tutorial, you need to understand how the Spring MVC form binding works.

1.1 In controller, you add an object into a model attribute.

```
@RequestMapping(value = "/users/add", method = RequestMethod.GET)
public String showAddUserForm(Model model) {

   User user = new User();
   model.addAttribute("userForm", user);
   //...
}
```

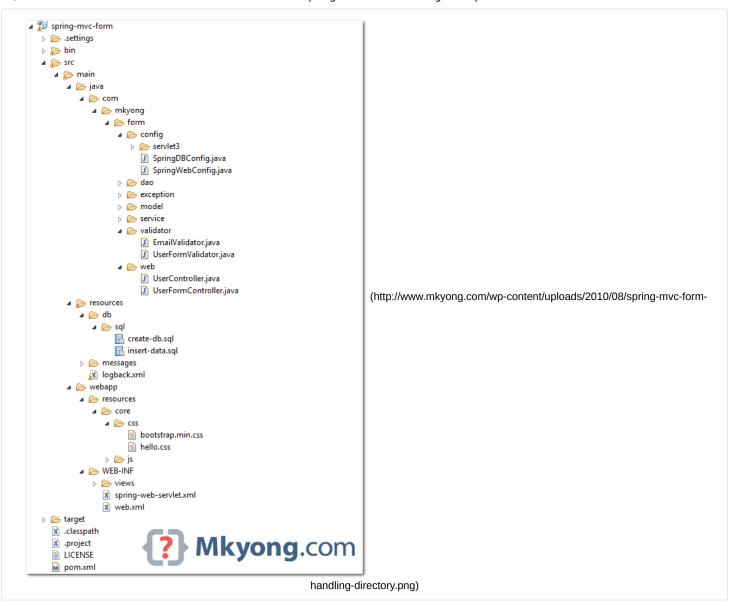
1.2 In HTML form, you use spring: form tag and bind the controller object via modelAttribute.

1.3 When the HTML form is "POST", you get the value via @ModelAttribute.

Done. Let start the tutorial.

## 1. Project Directory

This is the final project directory structure. A standard Maven project.



## 2. Project Dependencies

To develop a Spring MVC project, you need spring-webmvc.

pom.xml

```
project xmlns="http://maven.apache.org/POM/4.0.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0"
   http://maven.apache.org/maven-v4_0_0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mkyong.form</groupId>
    <artifactId>spring-mvc-form</artifactId>
    <packaging>war</packaging>
    <version>1.0-SNAPSHOT
    <name>SpringMVC + Form Handling Example
    cproperties>
       <jdk.version>1.7</jdk.version>
        <spring.version>4.1.6.RELEASE</spring.version>
        <hsqldb.version>2.3.2</hsqldb.version>
       <logback.version>1.1.3</logback.version>
        <jcl.slf4j.version>1.7.12</jcl.slf4j.version>
       <jstl.version>1.2</jstl.version>
        <servletapi.version>3.1.0</servletapi.version>
    </properties>
    <dependencies>
       <!-- Spring Core -->
            <groupId>org.springframework</groupId>
            <artifactId>spring-core</artifactId>
            <version>${spring.version}</version>
            <exclusions>
              <exclusion>
               <groupId>commons-logging
               <artifactId>commons-logging</artifactId>
               </exclusion>
            </exclusions>
        </dependency>
       <!-- Spring Web -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>${spring.version}</version>
        </dependency>
       <!-- Spring JDBC -->
            <groupId>org.springframework</groupId>
            <artifactId>spring-jdbc</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <!-- HyperSQL DB -->
        <dependency>
            <groupId>org.hsqldb</groupId>
            <artifactId>hsqldb</artifactId>
            <version>${hsqldb.version}</version>
        </dependency>
        <!-- logging -->
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>jcl-over-slf4j</artifactId>
            <version>${jcl.slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>ch.qos.logback
            <artifactId>logback-classic</artifactId>
            <version>${logback.version}</version>
        </dependency>
        <!-- jstl -->
        <dependency>
            <groupId>jstl</groupId>
            <artifactId>jstl</artifactId>
            <version>${jstl.version}</version>
        </dependency>
```

```
<dependency>
           <groupId>javax.servlet
           <artifactId>javax.servlet-api</artifactId>
           <version>${servletapi.version}</version>
           <scope>provided</scope>
       </dependency>
   </dependencies>
   <build>
       <plugins>
           <plugin>
               <groupId>org.apache.maven.plugins
               <artifactId>maven-compiler-plugin</artifactId>
               <version>3.3
               <configuration>
                   <source>${jdk.version}</source>
                   <target>${jdk.version}</target>
               </configuration>
           </plugin>
           <!-- embedded Jetty server, for testing -->
           <plugin>
               <groupId>org.eclipse.jetty</groupId>
               <artifactId>jetty-maven-plugin</artifactId>
               <version>9.2.11.v20150529/version>
               <configuration>
                 <scanIntervalSeconds>10</scanIntervalSeconds>
                   <contextPath>/spring-mvc-form</contextPath>
                 </webApp>
               </configuration>
           </plugin>
           <!-- configure Eclipse workspace -->
           <plugin>
               <groupId>org.apache.maven.plugins
               <artifactId>maven-eclipse-plugin</artifactId>
               <version>2.9</version>
               <configuration>
                   <downloadSources>true</downloadSources>
                   <downloadJavadocs>true</downloadJavadocs>
                   <wtpversion>2.0</wtpversion>
                   <wtpContextName>spring-mvc-form</wtpContextName>
               </configuration>
           </plugin>
       </plugins>
   </build>
</project>
```

### 3. Controller

Spring @Controller class to show you how to bind the form value via @ModelAttribute, add a form validator, add message into flash attribute, populate values for dropdown and checkboxes and etc. Read the comments for self-explanatory.

```
UserController.java
```

```
package com.mkyong.form.web;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.LinkedHashMap;
import java.util.List;
import java.util.Map;
import javax.servlet.http.HttpServletRequest;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.dao.EmptyResultDataAccessException;
import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.validation.BindingResult;
import org.springframework.validation.annotation.Validated;
import org.springframework.web.bind.WebDataBinder;
import org.springframework.web.bind.annotation.ExceptionHandler;
import org.springframework.web.bind.annotation.InitBinder;
import org.springframework.web.bind.annotation.ModelAttribute;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestMethod;
import org.springframework.web.servlet.ModelAndView;
import org.springframework.web.servlet.mvc.support.RedirectAttributes;
import com.mkyong.form.model.User;
import com.mkyong.form.service.UserService;
import com.mkyong.form.validator.UserFormValidator;
@Controller
public class UserController {
   private final Logger logger = LoggerFactory.getLogger(UserController.class);
    @Autowired
   private UserService userService;
   @Autowired
   UserFormValidator userFormValidator;
    //Set a form validator
   protected void initBinder(WebDataBinder binder) {
       binder.setValidator(userFormValidator);
   @RequestMapping(value = "/", method = RequestMethod.GET)
   public String index(Model model) {
       logger.debug("index()");
        return "redirect:/users";
   }
   @RequestMapping(value = "/users", method = RequestMethod.GET)
    public String showAllUsers(Model model) {
        logger.debug("showAllUsers()");
       model.addAttribute("users", userService.findAll());
        return "users/list";
   }
   // save or update user
   // 1. @ModelAttribute bind form value
   // 2. @Validated form validator
    // 3. RedirectAttributes for flash value
    @RequestMapping(value = "/users", method = RequestMethod.POST)
   public String saveOrUpdateUser(@ModelAttribute("userForm") @Validated User user,
            BindingResult result. Model model.
            final RedirectAttributes redirectAttributes) {
        logger.debug("saveOrUpdateUser() : {}", user);
```

```
if (result.hasErrors()) {
        populateDefaultModel(model);
        return "users/userform";
    } else {
        // Add message to flash scope
        redirectAttributes.addFlashAttribute("css", "success");
        if(user.isNew()){
          redirectAttributes.addFlashAttribute("msg", "User added successfully!");
        }else{
          redirectAttributes.addFlashAttribute("msg", "User updated successfully!");
        }
        userService.saveOrUpdate(user);
        // POST/REDIRECT/GET
        return "redirect:/users/" + user.getId();
        // POST/FORWARD/GET
        // return "user/list";
    }
}
// show add user form
@RequestMapping(value = "/users/add", method = RequestMethod.GET)
public String showAddUserForm(Model model) {
    logger.debug("showAddUserForm()");
    User user = new User();
    // set default value
    user.setName("mkyong123");
    user.setEmail("test@gmail.com");
    user.setAddress("abc 88");
    user.setNewsletter(true);
    user.setSex("M");
    user.setFramework(new ArrayList<String>(Arrays.asList("Spring MVC", "GWT")));
    user.setSkill(new ArrayList<String>(Arrays.asList("Spring", "Grails", "Groovy")));
    user.setCountry("SG");
    user.setNumber(2);
    model.addAttribute("userForm", user);
    populateDefaultModel(model);
    return "users/userform";
}
// show update form
@RequestMapping(value = "/users/{id}/update", method = RequestMethod.GET)
public String showUpdateUserForm(@PathVariable("id") int id, Model model) {
    logger.debug("showUpdateUserForm() : {}", id);
    User user = userService.findById(id);
    model.addAttribute("userForm", user);
    populateDefaultModel(model);
    return "users/userform";
}
// delete user
@RequestMapping(value = "/users/{id}/delete", method = RequestMethod.POST)
public String deleteUser(@PathVariable("id") int id,
    final RedirectAttributes redirectAttributes) {
    logger.debug("deleteUser() : {}", id);
    userService.delete(id);
    redirectAttributes.addFlashAttribute("css", "success");
    redirectAttributes.addFlashAttribute("msg", "User is deleted!");
```

```
return "redirect:/users";
   }
    // show user
    @RequestMapping(value = "/users/{id}", method = RequestMethod.GET)
    public String showUser(@PathVariable("id") int id, Model model) {
        logger.debug("showUser() id: {}", id);
        User user = userService.findById(id);
        if (user == null) {
            model.addAttribute("css", "danger");
            model.addAttribute("msg", "User not found");
        model.addAttribute("user", user);
        return "users/show";
   }
    private void populateDefaultModel(Model model) {
        List<String> frameworksList = new ArrayList<String>();
        frameworksList.add("Spring MVC");
        frameworksList.add("Struts 2");
        frameworksList.add("JSF 2");
        frameworksList.add("GWT");
        frameworksList.add("Play");
        frameworksList.add("Apache Wicket");
        model.addAttribute("frameworkList", frameworksList);
        Map<String, String> skill = new LinkedHashMap<String, String>();
        skill.put("Hibernate", "Hibernate");
        skill.put("Spring", "Spring");
        skill.put("Struts", "Struts");
        skill.put("Groovy", "Groovy");
skill.put("Grails", "Grails");
        model.addAttribute("javaSkillList", skill);
        List<Integer> numbers = new ArrayList<Integer>();
        numbers.add(1);
        numbers.add(2);
        numbers.add(3);
        numbers.add(4);
        numbers.add(5);
        model.addAttribute("numberList", numbers);
        Map<String, String> country = new LinkedHashMap<String, String>();
        country.put("US", "United Stated");
        country.put("CN", "China");
        country.put("SG", "Singapore");
country.put("MY", "Malaysia");
        model.addAttribute("countryList", country);
    }
}
```

## 4. Form Validator

4.1 Spring validator example.

UserFormValidator.java

```
package com.mkyong.form.validator;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.beans.factory.annotation.Qualifier;
import org.springframework.stereotype.Component;
import org.springframework.validation.Errors;
import org.springframework.validation.ValidationUtils;
import org.springframework.validation.Validator;
import com.mkyong.form.model.User;
import com.mkyong.form.service.UserService;
@Component
public class UserFormValidator implements Validator {
    @Autowired
    @Qualifier("emailValidator")
    EmailValidator emailValidator;
    @Autowired
    UserService userService;
    @Override
    public boolean supports(Class<?> clazz) {
        return User.class.equals(clazz);
    @Override
    public void validate(Object target, Errors errors) {
        User user = (User) target;
        ValidationUtils.rejectIfEmptyOrWhitespace(errors, "name", "NotEmpty.userForm.name");
        ValidationUtils.rejectIfEmptyOrWhitespace(errors, "email", "NotEmpty.userForm.email");
        ValidationUtils.rejectIfEmptyOrWhitespace(errors, "address", "NotEmpty.userForm.address");
        Validation Utils.reject If Empty 0 r White space (errors, "password", "Not Empty.user Form.password");\\
        ValidationUtils.rejectIfEmptyOrWhitespace(errors, "confirmPassword","NotEmpty.userForm.confirmPassword"); ValidationUtils.rejectIfEmptyOrWhitespace(errors, "sex", "NotEmpty.userForm.sex");
        ValidationUtils.rejectIfEmptyOrWhitespace(errors, "country", "NotEmpty.userForm.country");
        if(!emailValidator.valid(user.getEmail())){
            errors.rejectValue("email", "Pattern.userForm.email");
        if(user.getNumber()==null || user.getNumber()<=0){</pre>
            errors.rejectValue("number", "NotEmpty.userForm.number");
        }
        if(user.getCountry().equalsIgnoreCase("none")){
            errors.rejectValue("country", "NotEmpty.userForm.country");
        if (!user.getPassword().equals(user.getConfirmPassword())) {
            errors.rejectValue("confirmPassword", "Diff.userform.confirmPassword");
        if (user.getFramework() == null || user.getFramework().size() < 2) {</pre>
            errors.rejectValue("framework", "Valid.userForm.framework");
        if (user.getSkill() == null || user.getSkill().size() < 3) {</pre>
            errors.rejectValue("skill", "Valid.userForm.skill");
    }
}
```

validation.properties

```
NotEmpty.userForm.name = Name is required!
NotEmpty.userForm.email = Email is required!
NotEmpty.userForm.address = Address is required!
NotEmpty.userForm.password = Password is required!
NotEmpty.userForm.confirmPassword = Confirm password is required!
NotEmpty.userForm.sex = Sex is required!
NotEmpty.userForm.number = Number is required!
NotEmpty.userForm.country = Country is required!
Valid.userForm.framework = Please select at least two frameworks!
Valid.userForm.skill = Please select at least three skills!
Diff.userform.confirmPassword = Passwords do not match, please retype!
Pattern.userForm.email = Invalid Email format!
```

To run the Spring Validator, add the validator via @InitBinder and annotate the model with @Validated

Or run it manually.

## 5. HTML Forms

All the HTML forms are css styling with Bootstrap framework, and using Spring form tags to do the display and form binding. 5.1 User Listings.

list.jsp

```
<%@ page session="false"%>
<%@ taglib prefix="spring" uri="http://www.springframework.org/tags"%>
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
<%@ taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt"%>
<!DOCTYPE html>
<html lang="en">
<jsp:include page="../fragments/header.jsp" />
<body>
   <div class="container">
       <c:if test="${not empty msg}">
           <div class="alert alert-${css} alert-dismissible" role="alert">
           <button type="button" class="close" data-dismiss="alert"</pre>
                             aria-label="Close">
              <span aria-hidden="true">x</span>
           </button>
           <strong>${msg}</strong>
           </div>
       </c:if>
       <h1>All Users</h1>
       <thead>
              #ID
                  Name
                  Email
                  framework
                  Action
              </thead>
           <c:forEach var="user" items="${users}">
              ${user.id}
              ${user.name}
              ${user.email}
              <c:forEach var="framework" items="${user.framework}"
                                                        varStatus="loop">
                  ${framework}
                         <c:if test="${not loop.last}">,</c:if>
                </c:forEach>
                             <spring:url value="/users/${user.id}" var="userUrl" />
                <spring:url value="/users/${user.id}/delete" var="deleteUrl" />
                <spring:url value="/users/${user.id}/update" var="updateUrl" />
                <button class="btn btn-info"</pre>
                                      onclick="location.href='${userUrl}'">Query</button>
                <button class="btn btn-primary"</pre>
                                      onclick="location.href='${updateUrl}'">Update</button>
                <button class="btn btn-danger"</pre>
                                      onclick="this.disabled=true;post('${deleteUrl}')">Delete</button>
                             </c:forEach>
       </div>
   <jsp:include page="../fragments/footer.jsp" />
</body>
</html>
```

show.jsp

```
<%@ page session="false"%>
<%@ taglib prefix="spring" uri="http://www.springframework.org/tags"%>
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
<%@ taglib prefix="form" uri="http://www.springframework.org/tags/form"%>
<%@ taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt"%>
<!DOCTYPE html>
<html lang="en">
<jsp:include page="../fragments/header.jsp" />
<div class="container">
   <c:if test="${not empty msg}">
        <div class="alert alert-${css} alert-dismissible" role="alert">
            <button type="button" class="close" data-dismiss="alert"</pre>
                                aria-label="Close">
                <span aria-hidden="true">x</span>
            </button>
            <strong>${msg}</strong>
        </div>
    </c:if>
    <h1>User Detail</h1>
    <br />
    <div class="row">
        <label class="col-sm-2">ID</label>
        <div class="col-sm-10">${user.id}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Name</label>
        <div class="col-sm-10">${user.name}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Email</label>
        <div class="col-sm-10">${user.email}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Address</label>
        <div class="col-sm-10">${user.address}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Newsletter</label>
        <div class="col-sm-10">${user.newsletter}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Web Frameworks</label>
        <div class="col-sm-10">${user.framework}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Sex</label>
        <div class="col-sm-10">${user.sex}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Number</label>
        <div class="col-sm-10">${user.number}</div>
    </div>
    <div class="row">
        <label class="col-sm-2">Country</label>
        <div class="col-sm-10">${user.country}</div>
   </div>
    <div class="row">
        <label class="col-sm-2">Skill</label>
        <div class="col-sm-10">${user.skill}</div>
    </div>
```

```
</div>
```

userform.jsp

```
<%@ page session="false"%>
<%@ taglib prefix="spring" uri="http://www.springframework.org/tags"%>
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core"%>
<%@ taglib prefix="form" uri="http://www.springframework.org/tags/form"%>
<%@ taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt"%>
<!DOCTYPE html>
<html lang="en">
<jsp:include page="../fragments/header.jsp" />
<div class="container">
    <c:choose>
        <c:when test="${userForm['new']}">
            <h1>Add User</h1>
        </c:when>
        <c:otherwise>
            <h1>Update User</h1>
        </c:otherwise>
   </c:choose>
    <br />
   <spring:url value="/users" var="userActionUrl" />
    <form:form class="form-horizontal" method="post"
                modelAttribute="userForm" action="${userActionUrl}">
        <form:hidden path="id" />
        <spring:bind path="name">
          <div class="form-group ${status.error ? 'has-error' : ''}">
            <label class="col-sm-2 control-label">Name</label>
            <div class="col-sm-10">
                <form:input path="name" type="text" class="form-control"</pre>
                                id="name" placeholder="Name" />
                <form:errors path="name" class="control-label" />
            </div>
          </div>
        </spring:bind>
        <spring:bind path="email">
          <div class="form-group ${status.error ? 'has-error' : ''}">
            <label class="col-sm-2 control-label">Email</label>
            <div class="col-sm-10">
                <form:input path="email" class="form-control"</pre>
                                id="email" placeholder="Email" />
                <form:errors path="email" class="control-label" />
            </div>
          </div>
        </spring:bind>
        <spring:bind path="password">
          <div class="form-group ${status.error ? 'has-error' : ''}">
            <label class="col-sm-2 control-label">Password</label>
            <div class="col-sm-10">
                <form:password path="password" class="form-control"</pre>
                                id="password" placeholder="password" />
                <form:errors path="password" class="control-label" />
            </div>
          </div>
        </spring:bind>
        <spring:bind path="confirmPassword">
          <div class="form-group ${status.error ? 'has-error' : ''}">
            <label class="col-sm-2 control-label">confirm Password</label>
            <div class="col-sm-10">
                <form:password path="confirmPassword" class="form-control"</pre>
                                id="password" placeholder="password" />
                <form:errors path="confirmPassword" class="control-label" />
            </div>
          </div>
        </spring:bind>
        <spring:bind path="address">
          <div class="form-group ${status.error ? 'has-error' : ''}">
```

```
<label class="col-sm-2 control-label">Address</label>
    <div class="col-sm-10">
        <form:textarea path="address" rows="5" class="form-control"
                        id="address" placeholder="address" />
        <form:errors path="address" class="control-label" />
    </div>
  </div>
</spring:bind>
<spring:bind path="newsletter">
  <div class="form-group ${status.error ? 'has-error' : ''}">
    <label class="col-sm-2 control-label">Newsletter</label>
    <div class="col-sm-10">
        <div class="checkhox">
          <label>
                             <form:checkbox path="newsletter" id="newsletter" />
          </lahel>
             <form:errors path="newsletter" class="control-label" />
        </div>
    </div>
  </div>
</spring:bind>
<spring:bind path="framework">
 <div class="form-group ${status.error ? 'has-error' : ''}">
    <label class="col-sm-2 control-label">Web Frameworks</label>
    <div class="col-sm-10">
        <form:checkboxes path="framework" items="${frameworkList}"
                         element="label class='checkbox-inline'" />
        <form:errors path="framework" class="control-label" />
    </div>
</spring:bind>
<spring:bind path="sex">
  <div class="form-group ${status.error ? 'has-error' : ''}">
    <label class="col-sm-2 control-label">Sex</label>
    <div class="col-sm-10">
        <label class="radio-inline">
                          <form:radiobutton path="sex" value="M" /> Male
        </label>
                        <label class="radio-inline">
                          <form:radiobutton path="sex" value="F" /> Female
        </label> <br />
        <form:errors path="sex" class="control-label" />
    </div>
  </div>
</spring:bind>
<spring:bind path="number">
  <div class="form-group ${status.error ? 'has-error' : ''}">
    <label class="col-sm-2 control-label">Number</label>
    <div class="col-sm-10">
        <form:radiobuttons path="number" items="${numberList}"</pre>
                        element="label class='radio-inline'" />
        <br />
        <form:errors path="number" class="control-label" />
    </div>
 </div>
</spring:bind>
<spring:bind path="country">
  <div class="form-group ${status.error ? 'has-error' : ''}">
   <label class="col-sm-2 control-label">Country</label>
    <div class="col-sm-5">
        <form:select path="country" class="form-control">
            <form:option value="NONE" label="--- Select ---" />
            <form:options items="${countryList}" />
        </form:select>
        <form:errors path="country" class="control-label" />
    </div>
    <div class="col-sm-5"></div>
  </div>
</spring:bind>
<spring:bind path="skill">
```

```
<div class="form-group ${status.error ? 'has-error' : ''}">
            <label class="col-sm-2 control-label">Java Skills</label>
            <div class="col-sm-5">
                <form:select path="skill" items="${javaSkillList}"</pre>
                                 multiple="true" size="5" class="form-control" />
                <form:errors path="skill" class="control-label" />
            </div>
            <div class="col-sm-5"></div>
          </div>
        </spring:bind>
        <div class="form-group">
          <div class="col-sm-offset-2 col-sm-10">
           <c:choose>
              <c:when test="${userForm['new']}">
                 <button type="submit" class="btn-lg btn-primary pull-right">Add
                             </button>
              </c:when>
              <c:otherwise>
                 <button type="submit" class="btn-lg btn-primary pull-right">Update
              </c:otherwise>
            </c:choose>
          </div>
        </div>
    </form:form>
<jsp:include page="../fragments/footer.jsp" />
</body>
</html>
```

## 6. Database Stuff

6.1 Create a table and insert some data for testing.

```
CREATE TABLE users (
   id INTEGER GENERATED BY DEFAULT AS IDENTITY(START WITH 100, INCREMENT BY 1) PRIMARY KEY,
   name VARCHAR(30),
   email VARCHAR(50),
   address VARCHAR(255),
   password VARCHAR(20),
   newsletter BOOLEAN,
   framework VARCHAR(500),
   sex VARCHAR(1),
   NUMBER INTEGER,
   COUNTRY VARCHAR(10),
   SKILL VARCHAR(500)
);
```

```
insert-data.sql

INSERT INTO users (name, email, framework) VALUES ('mkyong', 'mkyong@gmail.com', 'Spring MVC, GWT');
INSERT INTO users (name, email) VALUES ('alex', 'alex@yahoo.com', 'Spring MVC, GWT');
INSERT INTO users (name, email) VALUES ('joel', 'joel@gmail.com', 'Spring MVC, GWT');
```

6.2 Start a HSQLDB embedded database, create a datasource and jdbcTemplate.

```
SpringDBConfig.java
```

```
package com.mkyong.form.config;
import javax.sql.DataSource;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.annotation.Bean;
import\ org. spring framework. context. annotation. Configuration;\\
import org.springframework.jdbc.core.namedparam.NamedParameterJdbcTemplate;
import\ org.springframework.jdbc.datasource.embedded.EmbeddedDatabase;
import\ org.spring framework.jdbc.data source.embedded. Embedded Database Builder;
import\ org.spring framework.jdbc.data source.embedded. Embedded Database Type;
@Configuration
public class SpringDBConfig {
    @Autowired
   DataSource dataSource;
   @Bean
   public NamedParameterJdbcTemplate getNamedParameterJdbcTemplate() {
        return new NamedParameterJdbcTemplate(dataSource);
   @Bean
   public DataSource getDataSource() {
        EmbeddedDatabaseBuilder builder = new EmbeddedDatabaseBuilder();
        EmbeddedDatabase db = builder.setName("testdb")
                        .setType(EmbeddedDatabaseType.HSQL)
            .addScript("db/sql/create-db.sql")
                        .addScript("db/sql/insert-data.sql").build();
        return db;
   }
}
```

### 6.3 User object.

user.java

```
package com.mkyong.form.model;
import java.util.List;
public class User {
   // form:hidden - hidden value
   Integer id;
    // form:input - textbox
    String name;
    // form:input - textbox
   String email;
    // form:textarea - textarea
   String address;
    // form:input - password
   String password;
    // form:input - password
   String confirmPassword;
    // form:checkbox - single checkbox
   boolean newsletter;
    // form:checkboxes - multiple checkboxes
   List<String> framework;
    // form:radiobutton - radio button
   String sex;
    // form:radiobuttons - radio button
   Integer number;
    // form:select - form:option - dropdown - single select
   String country;
    // form:select - multiple=true - dropdown - multiple select
   List<String> skill;
   //Check if this is for New of Update
    public boolean isNew() {
        return (this.id == null);
    //...
}
```

## 7. Services and DAO

```
UserService.java

package com.mkyong.form.service;
import java.util.List;
import com.mkyong.form.model.User;

public interface UserService {
    User findById(Integer id);
    List<User> findAll();
    void saveOrUpdate(User user);
    void delete(int id);
}
```

```
package com.mkyong.form.service;
import java.util.List;
import\ org. spring framework. beans. factory. annotation. Autowired;
import org.springframework.stereotype.Service;
import com.mkyong.form.dao.UserDao;
import com.mkyong.form.model.User;
@Service("userService")
public class UserServiceImpl implements UserService {
   UserDao userDao;
   @Autowired
   public void setUserDao(UserDao userDao) {
        this.userDao = userDao;
   @Override
   public User findById(Integer id) {
        return userDao.findById(id);
   @Override
   public List<User> findAll() {
        return userDao.findAll();
   @Override
   public void saveOrUpdate(User user) {
        if (findById(user.getId())==null) {
           userDao.save(user);
       } else {
            userDao.update(user);
   }
   @Override
   public void delete(int id) {
       userDao.delete(id);
}
```

```
UserDao.java

package com.mkyong.form.dao;
import java.util.List;
import com.mkyong.form.model.User;
public interface UserDao {
    User findById(Integer id);
    List<User> findAll();
    void save(User user);
    void update(User user);
    void delete(Integer id);
}
```

UserDaoImpl.java

```
package com.mkyong.form.dao;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.dao.DataAccessException;
import\ org.spring framework.dao. EmptyResultDataAccess Exception;
import org.springframework.jdbc.core.RowMapper;
import\ org.spring framework.jdbc.core.namedparam. Map Sql Parameter Source;
import\ org.spring framework.jdbc.core.named param.Named Parameter Jdbc Template;
import org.springframework.jdbc.core.namedparam.SqlParameterSource;
import\ org.spring framework.jdbc.support.Generated Key Holder;
import org.springframework.jdbc.support.KeyHolder;
import org.springframework.stereotype.Repository;
import org.springframework.util.StringUtils;
import com.mkyong.form.model.User;
@Repository
public class UserDaoImpl implements UserDao {
    NamedParameterJdbcTemplate namedParameterJdbcTemplate;
    @Autowired
   public void setNamedParameterJdbcTemplate(
        NamedParameterJdbcTemplate namedParameterJdbcTemplate) {
        this.namedParameterJdbcTemplate = namedParameterJdbcTemplate;
   }
   @Override
   public User findById(Integer id) {
        Map<String, Object> params = new HashMap<String, Object>();
        params.put("id", id);
        String sql = "SELECT * FROM users WHERE id=:id";
        User result = null;
        try {
            result = namedParameterJdbcTemplate
                          .queryForObject(sql, params, new UserMapper());
        } catch (EmptyResultDataAccessException e) {
            // do nothing, return null
        return result;
   }
    @Override
   public List<User> findAll() {
        String sql = "SELECT * FROM users";
        List<User> result = namedParameterJdbcTemplate.query(sql, new UserMapper());
        return result:
   }
   @Override
   public void save(User user) {
        KeyHolder keyHolder = new GeneratedKeyHolder();
        String sql = "INSERT INTO USERS(NAME, EMAIL, ADDRESS, PASSWORD, NEWSLETTER, FRAMEWORK, SEX, NUMBER, COUNTRY, SKILL) "
                + "VALUES ( :name, :email, :address, :password, :newsletter, :framework, :sex, :number, :country, :skill)";
        namedParameterJdbcTemplate.update(sql, getSqlParameterByModel(user), keyHolder);
        user.setId(keyHolder.getKey().intValue());
```

```
@Override
public void update(User user) {
    String sql = "UPDATE USERS SET NAME=:name, EMAIL=:email, ADDRESS=:address,
        + "PASSWORD=:password, NEWSLETTER=:newsletter, FRAMEWORK=:framework, '
        + "SEX=:sex, NUMBER=:number, COUNTRY=:country, SKILL=:skill WHERE id=:id";
    namedParameterJdbcTemplate.update(sql, getSqlParameterByModel(user));
}
@Override
public void delete(Integer id) {
    String sql = "DELETE FROM USERS WHERE id= :id";
    namedParameterJdbcTemplate.update(sql, new MapSqlParameterSource("id", id));
}
private SqlParameterSource getSqlParameterByModel(User user) {
    MapSqlParameterSource paramSource = new MapSqlParameterSource();
    paramSource.addValue("id", user.getId());
    paramSource.addValue("name", user.getName());
    paramSource.addValue("email", user.getEmail());
    paramSource.addValue("address", user.getAddress());
    paramSource.addValue("password", user.getPassword());
    paramSource.addValue("newsletter", user.isNewsletter());
    // join String
    paramSource.addValue("framework", convertListToDelimitedString(user.getFramework()));
    paramSource.addValue("sex", user.getSex());
    paramSource.addValue("number", user.getNumber());
    paramSource.addValue("country", user.getCountry());
    paramSource.addValue("skill", convertListToDelimitedString(user.getSkill()));
    return paramSource;
private static final class UserMapper implements RowMapper<User> {
    public User mapRow(ResultSet rs, int rowNum) throws SQLException {
        User user = new User();
        user.setId(rs.getInt("id"));
        user.setName(rs.getString("name"));
        user.setEmail(rs.getString("email"));
        user.setFramework(convertDelimitedStringToList(rs.getString("framework")));
        user.setAddress(rs.getString("address"));
        user.setCountry(rs.getString("country"));
        user.setNewsletter(rs.getBoolean("newsletter"));
        user.setNumber(rs.getInt("number"));
        user.setPassword(rs.getString("password"));
        user.setSex(rs.getString("sex"));
        user.setSkill(convertDelimitedStringToList(rs.getString("skill")));
        return user;
    }
}
private static List<String> convertDelimitedStringToList(String delimitedString) {
    List<String> result = new ArrayList<String>();
    if (!StringUtils.isEmpty(delimitedString)) {
        result = Arrays.asList(StringUtils.delimitedListToStringArray(delimitedString, ","));
    return result:
}
private String convertListToDelimitedString(List<String> list) {
    String result = "";
    if (list != null) {
        result = StringUtils.arrayToCommaDelimitedString(list.toArray());
    return result:
```

```
}
```

## 8. Spring Configuration

Mixing Spring XML and JavaConfig.

```
SpringWebConfig.java
package com.mkyong.form.config;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.ComponentScan;
import org.springframework.context.annotation.Configuration;
import\ org.spring framework.context.support.Resource Bundle Message Source;
import org.springframework.web.servlet.config.annotation.EnableWebMvc;
import org.springframework.web.servlet.config.annotation.ResourceHandlerRegistry;
import org.springframework.web.servlet.config.annotation.WebMvcConfigurerAdapter;
import\ org.spring framework.web.servlet.view. Internal Resource View Resolver;
import org.springframework.web.servlet.view.JstlView;
@EnableWebMvc
@Configuration
@ComponentScan({ "com.mkyong.form.web", "com.mkyong.form.service", "com.mkyong.form.dao",
        "com.mkyong.form.exception", "com.mkyong.form.validator" })
public class SpringWebConfig extends WebMvcConfigurerAdapter {
    @Override
   public void addResourceHandlers(ResourceHandlerRegistry registry) {
        registry. add Resource Handler ("/resources/**"). add Resource Locations ("/resources/");\\
   @Bean
   public InternalResourceViewResolver viewResolver() {
        InternalResourceViewResolver viewResolver = new InternalResourceViewResolver();
        viewResolver.setViewClass(JstlView.class);
        viewResolver.setPrefix("/WEB-INF/views/jsp/");
        viewResolver.setSuffix(".jsp");
        return viewResolver;
   }
   @Bean
   public ResourceBundleMessageSource messageSource() {
        ResourceBundleMessageSource rb = new ResourceBundleMessageSource();
        rb.setBasenames(new String[] { "messages/messages", "messages/validation" });
        return rb;
   }
}
```

```
spring-web-servlet.xml

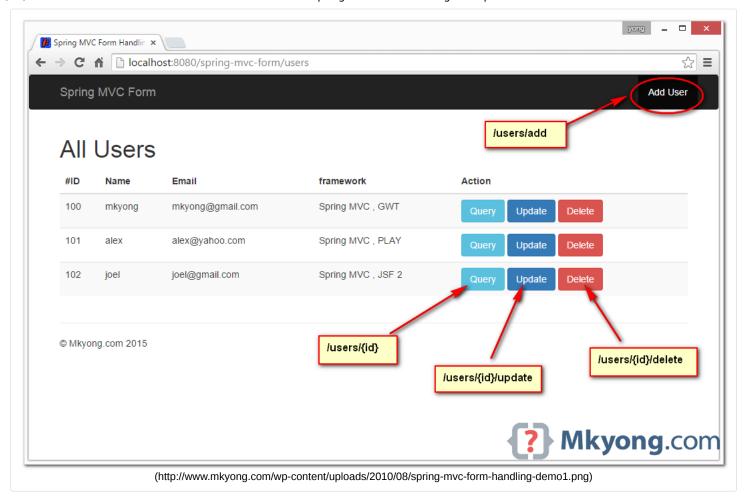
<beans xmlns="http://www.springframework.org/schema/beans"
    xmlns:context="http://www.springframework.org/schema/context"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:mvc="http://www.springframework.org/schema/mvc"
    xsi:schemaLocation="
        http://www.springframework.org/schema/beans
        http://www.springframework.org/schema/beans/spring-beans.xsd
        http://www.springframework.org/schema/mvc
        http://www.springframework.org/schema/mvc
        http://www.springframework.org/schema/mvc/spring-mvc.xsd
        http://www.springframework.org/schema/context
        http://www.springframework.org/schema/context
        http://www.springframework.org/schema/context
        http://www.springframework.org/schema/context/spring-context.xsd">
        <!-- Scan the JavaConfig -->
        <context:component-scan base-package="com.mkyong.form.config" />
    </beans>
```

```
web.xml
<web-app xmlns="http://java.sun.com/xml/ns/javaee"</pre>
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
         http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
   version="3.0">
    <display-name>Spring3 MVC Application</display-name>
    <servlet>
       <servlet-name>spring-web</servlet-name>
       <servlet-class>
           \verb|org.springframework.web.servlet.DispatcherServlet|\\
        </servlet-class>
       <load-on-startup>1</load-on-startup>
    </servlet>
   <servlet-mapping>
       <servlet-name>spring-web</servlet-name>
       <url-pattern>/</url-pattern>
   </servlet-mapping>
   <error-page>
       <error-code>500
       <location>/WEB-INF/views/jsp/error.jsp</location>
    </error-page>
   <error-page>
       <error-code>404
       <location>/WEB-INF/views/jsp/error.jsp</location>
   </error-page>
   <error-page>
       <location>/WEB-INF/views/jsp/error.jsp</location>
    </error-page>
</web-app>
```

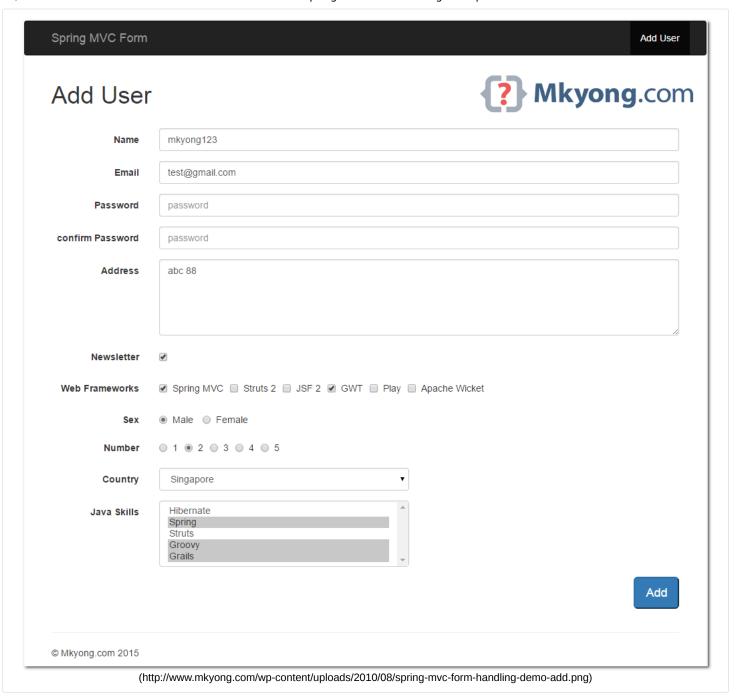
## 9. Demo

Download the project and type mvn jetty:run

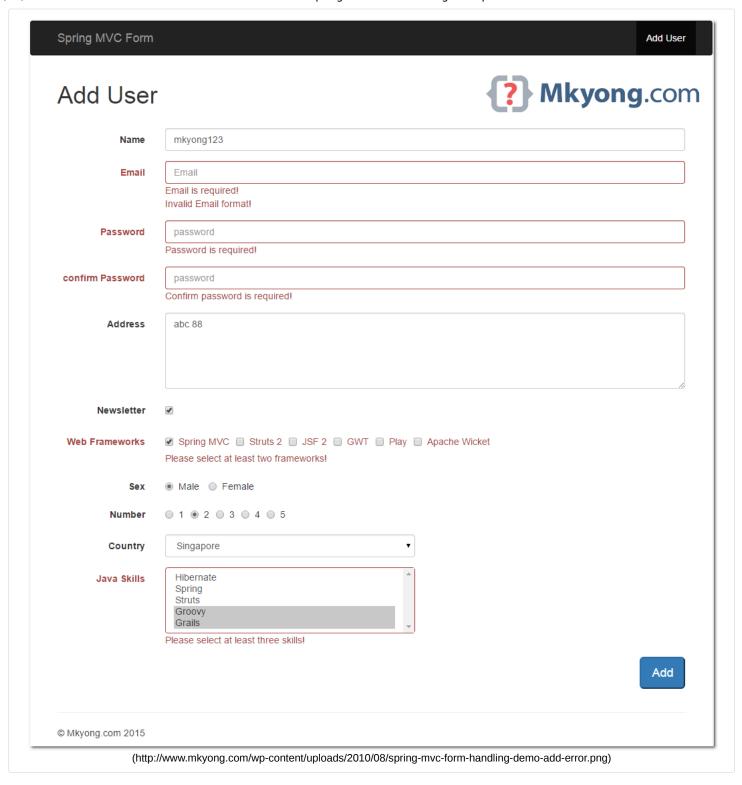
9.1 List all users. http://localhost:8080/spring-mvc-form/users



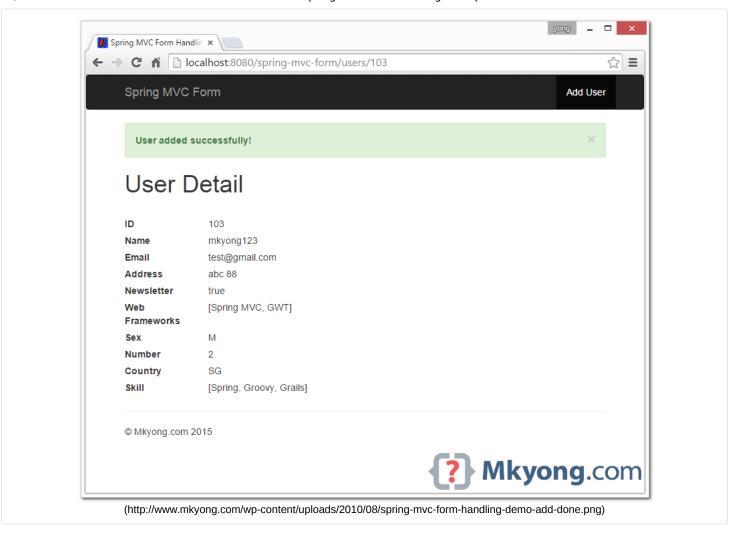
9.2 Add an user. http://localhost:8080/spring-mvc-form/users/add



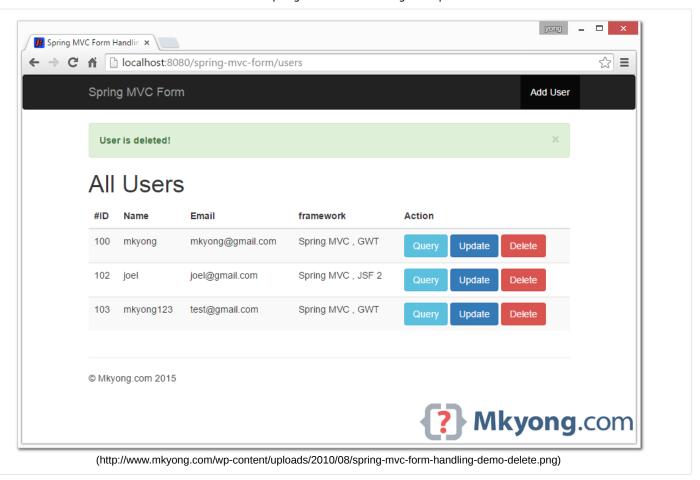
9.3 Form validation.



9.4 New user is added. http://localhost:8080/spring-mvc-form/users



9.5 Delete an user. http://localhost:8080/spring-mvc-form/users/104/delete



## **Download Source Code**

Download it - spring4-form-handle-example.zip (http://www.mkyong.com/wp-content/uploads/2010/08/spring4-form-handle-example.zip) (80 kb)

Github - TBD

## References

- 1. Using Spring's form tag library (http://docs.spring.io/spring/docs/current/spring-framework-reference/html/view.html#view-jsp-formtaglib)
- 2. Spring MVC 3 Validation (http://docs.spring.io/spring/docs/current/spring-framework-reference/html/validation.html#validation-mvc)
- RedirectAttributes JavaDoc (http://docs.spring.io/spring/docs/current/javadocapi/org/springframework/web/servlet/mvc/support/RedirectAttributes.html)

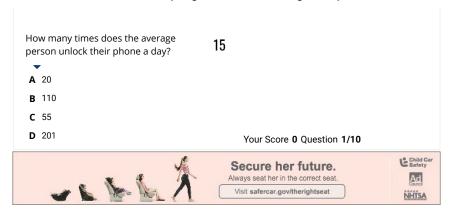
Tags: form handling (http://www.mkyong.com/tag/form-handling/) spring mvc (http://www.mkyong.com/tag/spring-mvc/)

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(https://plus.google.com/110948163568945735692?rel=author). If you like my tutorials, consider make a donation to these charities (http://www.mkyong.com/blog/donate-to-charity/).

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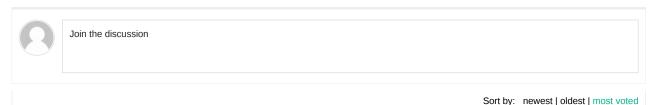
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#### Kiran

Perfect code for any beginner to understand the MVC design and their separations of layers.

Guest



O 4 days 11 hours ago



### Tushar Girase

Awesome design man I was searching for kind of website which will give me the best practice to develop a website.

Gues



7 months 8 days ago



Guest

## Problematic

Hey thanx for tutorial:) Sadly, Spring is throwing an UnsatisfiedDependencyException: (This is full message Error creating bean with name 'springDBConfig': Unsatisfied dependency expressed through field 'dataSource'; nested exception is org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'getDataSource' defined in com.form.config.SpringDBConfig: Bean instantiation via factory method failed; nested exception is org.springframework.beans.BeanInstantiationException: Failed to instantiate [javax.sql.DataSource]: Circular reference involving containing bean 'springDBConfig' – consider declaring the factory method as static for independence from its containing instance. Factory method 'getDataSource' threw exception; nested exception is org.springframework.jdbc.datasource.init.ScriptStatementFailedException: Failed to execute SQL script statement #2 of class path resource [db/sql/insert-data.sql]: INSERT INTO users... Read more »



② 7 months 23 days ago



## Soumya Ranjan Das Srd

Thanks sir.

Gues



② 8 months 3 days ago



Dynamic checkboxes

### Spring MVC form handling example

Guest

Thank you for your post, please create new post about dynamic checkboxes coming from database using many to many annotation in Spring MVC



2 8 months 10 days ago



Guest

### Dávid Hreško

How can i change embeded hsqldb to mysql with hib ernate? ...is it possible? ...answer please:)



9 months 28 days ago



Guest

### Tom

I have this tag: in the form for updating user info, use\_id is an Integer object, but when click submit, user\_id=null, if I change user\_id to an int variable then result is user\_id=0. So I can't update user info.

Can you help solve this problem?



10 months 22 days ago



#### Basu Dapalapur

I am trying to Add one new column in the same users table , Its not working, DROP TABLE users IF EXISTS; CREATE TABLE users ( id INTEGER GENERATED BY DEFAULT AS IDENTITY(START WITH 100, INCREMENT BY 1) PRIMARY KEY, name VARCHAR(30), email VARCHAR(50), address VARCHAR(255), password VARCHAR(20), newsletter BOOLEAN, framework VARCHAR(500), sex VARCHAR(1), NUMBER INTEGER, COUNTRY VARCHAR(10), SKILL VARCHAR(500), mobileNumber VARCHAR(15)); private SqlParameterSource getSqlParameterByModel(User user) { // Unable to handle List or Array // BeanPropertySqlParameterSource MapSqlParameterSource = new MapSqlParameterSource(); paramSource.addValue("id", user.getId()); ..... // paramSource.addValue("mobileNumber", user.getMobileNumber()); // join String .... return paramSource; } private static final class UserMapper implements... Read more »



② 11 months 13 days ago



### Meena Kannan

Hi Can anybody pls help me to setup this project in eclipse?

Guest



② 1 year 1 month ago



### kolivanov84

Hi, I'm following your tutorial, I already created a database mysql without using EmbeddedDatabaseBuilder class. How can I create the db connection? How can I create a mysql datasource using SpringDBConfig class?



② 1 year 1 month ago



#### Zacson Skaria

Can you please share the header.jsp and footer.jsp?

Guest



② 1 year 1 month ago



#### Vinicius Telles

MK great example. Congratulations.

Guest



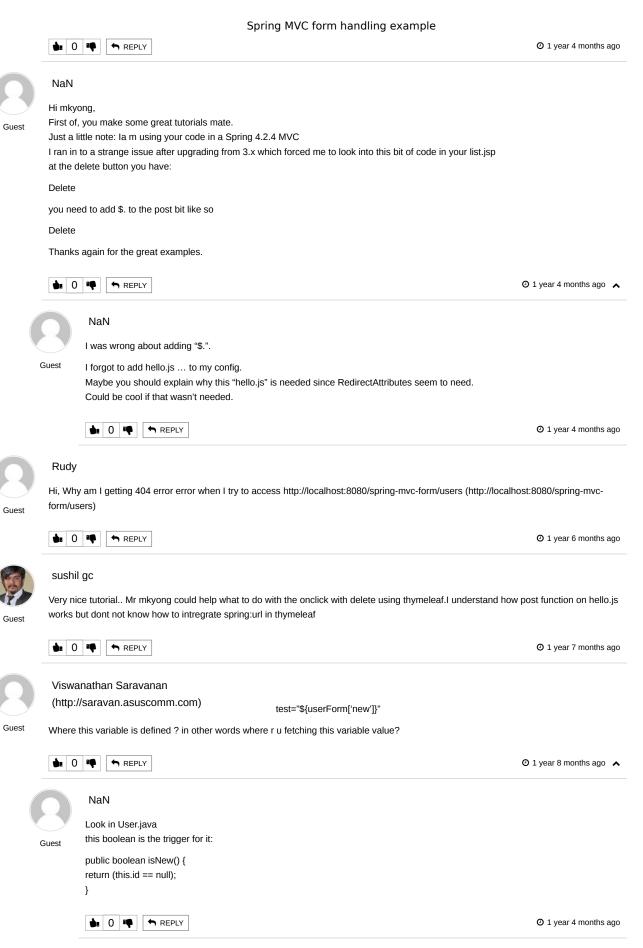
② 1 year 2 months ago



### NaN

validation.properties might be interesting to show as a file in this tutorial.

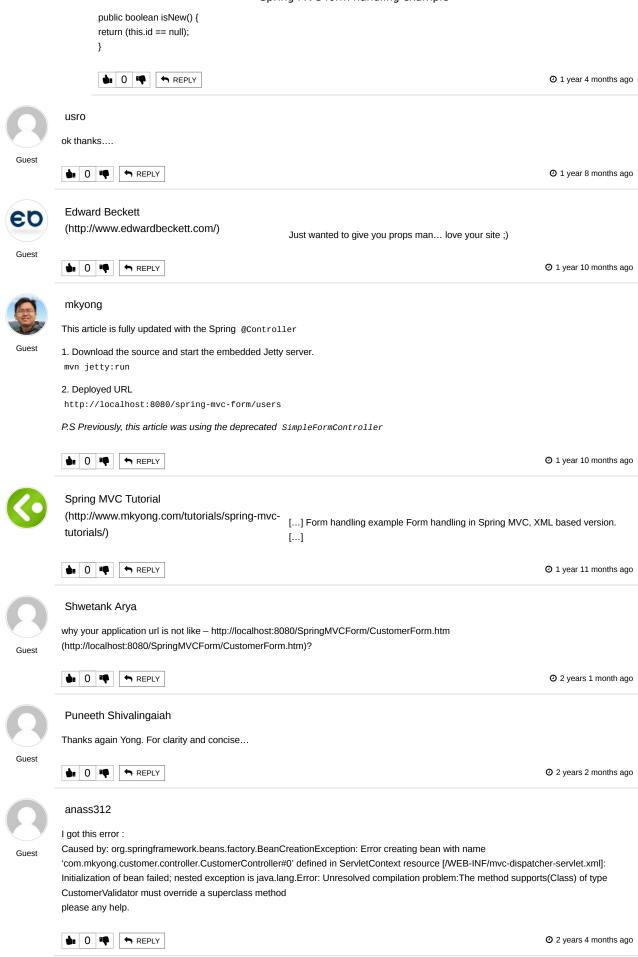
 $\label{eq:Guest} \qquad \text{It's in the download. But unexplained.}$ 

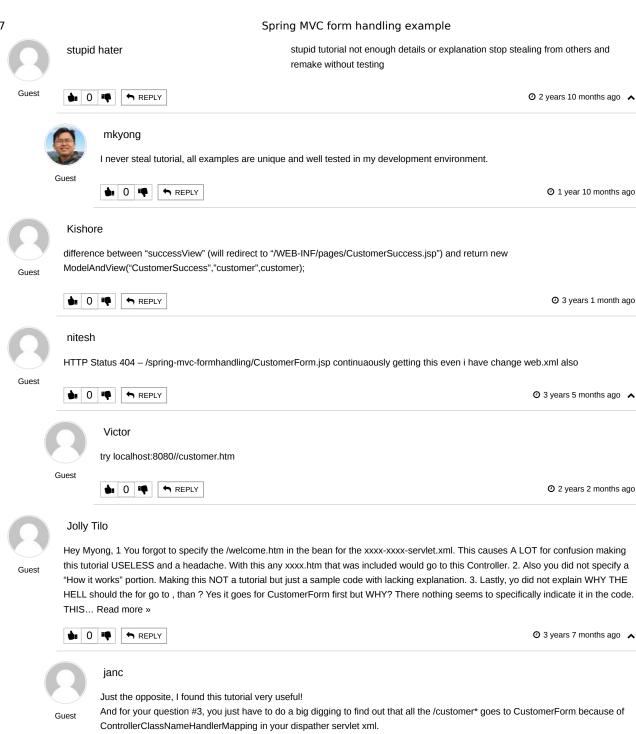




### NaN

I saw your question and thought... Yeah how was that again... Look in User.java





• 0 ♥ REPLY

② 3 years 2 months ago



## Tapanesh Dash

Please god shake don't tell useless............ If u found something then mention it .....Mkyong is doing good work. .....It will hurt to the person who is doing for our shake ......Give respect .......So that u will get respect .

But thanks for finding the reasons  $\ldots\ldots\ldots$  :) . It was typo mistake .

Same thing u can ask politely? .....



② 3 years 5 months ago



#### Ariel

Hi Yong, in mvc-dispatcher-servlet.xml, you have declared CustomerForm, CustomerSuccess,and CustomerValidator as the properties of CustomerController. I couldn't understand this. Can you help me in this regard.