Spring Tutorial Notes

xml should be placed outside the com packages

notes:

- **3 ways of config:**
  - **full xml**
  - **xml component**
    - **<context: component - scan base-package=“name of the package” />**
  - **java config**

Annotation: (no need to use xml to define an object)

1. @Component — on top of object class
2. In client code, use lowercased version of the object class name

or

1. @Component(“name”)
2. In client code, specify the object using “name”

Autowiring: (use method without specifying, but look for it in components)

(constructor injection, setter injection, field injection)

- **Constructor injection:**

1. @Component — on top of the object class where method desired is defined
2. @Autowired — on top of the constructor where we use unspecified method

- **Setter injection: (inject dependencies by calling setter methods on class)**

1. same but in setter

as a matter of fact, any method can use tech

- **Field injection: (injection dependencies by setting field values on your class directly)**

1. same but on top of field

- **autowiring and qualifiers**

1. @Qualifier(class name with lowercase) under @Autowired

Bean scope with annotations

- @Scope(“desired_scope”) — on top of the object class. (singleton,

prototype, etc.)

Bean life cycle

- @PostConstruct (will execute after constructor is called)

and

- @PreDestroy (will execute before bean is destroy)

on methods

Spring config using Java code (no xml)

- **General define process**

1. Create a java class and annotated as @Configuration
2. Add component scanning support: @ComponentScan(“package_name”)
3. Read spring java configuration class **(AnnotationConfigApplicationContext context = new AnnotationConfigApplicationContext(SportConfig.class);**
4. Retrieve bean from spring container **(same as xml version)**

- **Define beans in spring**

1. Define method to expose bean (@Bean — **on top of method**)
2. Inject bean dependencies
3. Read spring java config class
4. Retrieve bean from spring container

- **Java config props**

1. Create properties file
2. Load properties file in spring config [e.g. @PropertySource("classpath:sport.properties”)]
3. Reference values from properties file [e.g. @Value("${foo.email}”)]

Spring MVC

framework for developing web application

- **configuration**:

1. Add config to file: WEB-INF/web.xml
    1. Configure spring MVC dispatcher servlet
    2. Set up URL mappings to spring mvc dispatcher servlet
2. Add config to file: WEB-INF/spring-mvc-demo-servlet.xml
    1. Add support for spring component scanning
    2. Add support for conversion, formatting and validation
    3. Configure spring mvc view resolver

- **Controller**

1. @Controller — on controller class
2. @Requestmapping(“/url_section”) — on controller method

- **HTML hyperlink**

e.g. Hello World form

- **MVC Model (container for application data)**
  In controller, can put anything in the model (string, database, object, etc.)
  JSP can access data from the model

1. Two params for controller method: HttpServletRequest and Model
2. HttpServletRequest.getParameter(“param_name”)
3. Model.addAttribute(“param_name”, param_value)

- **Binding request param (bind value of “studentName” to theName)**

e.g. public String processFormVersionThree(
@RequestParam("studentName") String theName,
Model model) {...}

- **Request Mapping for Controller**
  Serves as parent mapping for controller
  All request mapping on methods in the controller are relative
  Similar to folder directory structures
  @RequestMapping(“/root”) — on object
  @RequestMapping(“/branch”) — on methods

Form tags (generate HTML)

make use of data binding
automatically setting / retrieving data from a java object / bean

- **Test-Field:**
  <form:input.../>
  add model attribute
  in controller:

```
@RequestMapping("/showForm")
public String showForm(Model theModel) {

    // create a student object
    Student theStudent = new Student();

    //add student object to the model
    theModel.addAttribute("student", theStudent);

    return "student-form";
}

@RequestMapping("/processForm")
public String processForm(@ModelAttribute("student") Student theStudent) {

    // log the input data
    System.out.println("theStudent: " + theStudent.getFirstName() + " " +
```

```
theStudent.getLastName());

    return "student-confirmation";
}
```

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in jsp:

```
<%@ taglib prefix="form" uri="http://www.springframework.org/tags/form" %>
<form:form action="processForm" modelAttribute="student">

    First name: <form:input path="firstName" />

    <br><br>

    Last name: <form:input path="lastName" />

    <br><br>

    <input type="submit" value="Submit" />

</form:form>
```

```
The student is confirmed: ${student.firstName} ${student.lastName}
```

- **Drop down list:**
  <form:select .../>

  in jsp

```
<form:select path="country">
    <form:option value="China" label="China" />
    <form:option value="USA" label="USA" />
    <form:option value="Russia" label="Russia" />
    <form:option value="UK" label="UK" />
    <form:option value="France" label="France" />
</form:select>
```

OR

in object

LinkedHashMap

---

in jsp

```
<form:options items="${student.countryOptions}" />
```

- **Radio Buttons (multiple choice)**
  <form:radiobutons.../>

Java <**form:radiobutton** path="favoriteLanguage" value="Java" />
C# <**form:radiobutton** path="favoriteLanguage" value="C" />
PHP <**form:radiobutton** path="favoriteLanguage" value="PHP" />
Ruby <**form:radiobutton** path="favoriteLanguage" value="Ruby" />

- **Check boxes (choose multiple items)**
  <form:checkbox.../>
  in jsp

Linux <**form:checkbox** path="operatingSystems" value="Linux" />
Mac OS <**form:checkbox** path="operatingSystems" value="Mac OS" />

Spring and Validation

@NotNull — checks that the annotation value is not null
@Min — must be a number >= value
@Max — must be a number <= value
@Size — size must match the given size
@Pattern — must match the given size
@Future/@Past — data must be in future or past of given data
...

- **Validation required**

1. **Add validation rule to Customer class**
2. **Display error messages on HTML form**
3. **Perform validation in the Controller class**

```
@RequestMapping("/processForm")
public String processForm(
        @Valid @ModelAttribute("customer") Customer theCustomer,
        BindingResult theBindingResult) {

    System.out.println("last name: |" + theCustomer.getLastName() + "|");
    if (theBindingResult.hasErrors()) {
        return "customer-form";
    } else {
        return "customer-confirmation";
    }
```

```
}
```

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4. **Update confirmation page**

- **Validation initBinder (deal with white space i.e. make it invalid)**

1. **register custom editor in controller**
   @InitBinder

```
@InitBinder
public void initBinder(WebDataBinder dataBinder) {
    // true: if all whitespaces trim to null
    StringTrimmerEditor stringTrimmerEditor = new StringTrimmerEditor(true);
    dataBinder.registerCustomEditor(String.class, stringTrimmerEditor);
}
```

- **Validation number range (string length limitation)**

1. adding validation rule to object class on field

```
@Min(value = 0, message = "must be greater than or equal to 0")
@Max(value = 10, message = "must be less than or equal to 10")
private int freePasses;
```

- **Validation RegExp (match patterns)**

1. **add validation rule to object**

```
@Pattern(regexp = "^[a-zA-Z0-9]{5}", message = "only 5 chars/digits")
```

- **Validation Custom (e.g. must start with “...”)**

1. **create a custom java annotation**
   @CourseCode
2. **Create CourseCodeConstraintValidator**
   code: springmvc-demo/.../validation