Basic Spring 4.0

Document Revision History

Date	Revision No.	Author	Summary of Changes
Aug-2012	2.0	Mohan C	Lab book exercises are revamped
June-2013	3.0	Mohan C	Lab book exercises are revamped
June-2015	4.0	Rathnajothi.P	Upgraded from spring version 3 to 4
May-2016	5.0	Vinod Satpute	Revamped as per the integrated ELT TOC
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Table of Contents

Table of Contents 3
Getting Started 4
Overview 4
Setup Checklist for Spring Framework 4
Minimum System Requirements 4
Creating the first Spring application: 4
Lab 1. Injecting dependencies into a Spring application 5
Lab 2. Spring MVC with JPA ..... ***Error! Bookmark not defined.***
Lab 3. Injecting cross-cutting concerns 9
Appendices 15
Appendix A: Class Diagrams 15

Getting Started

Overview

This lab book is a guided tour for learning Basic Spring 4.0. It comprises solved examples and 'To Do' assignments. Follow the steps provided in the solved examples and work out the 'To Do' assignments given.

Setup Checklist for Spring Framework

Here is what is expected on your machine in order for the lab assignments to work.

Minimum System Requirements

- Intel Pentium IV or higher
- Microsoft Windows (NT 4.0/XP/2K)
- Memory: 256MB of RAM (512 recommended)
- 500MB hard disk space
- JDK version 1.8 + with help, Netscape or IE
- MS-Access/Connectivity to Oracle database
- Wildfly
- Eclipse Luna
- Spring4.0 API from https://spring.io/docs. Download spring-framework-4.0.3.RELEASE-with-docs.zip, which contains the documentation alsoand unzip it.

Creating the first Spring application:

- ✓ Ensure that Java 8 is installed and Eclipse Luna is available.
- ✓ You will need Wildfly server to work with.
- ✓ Unzip the spring-framework-4.0.3.RELEASE-with-docs.zip into any folder.
- ✓ Create a new project in eclipse and name it.

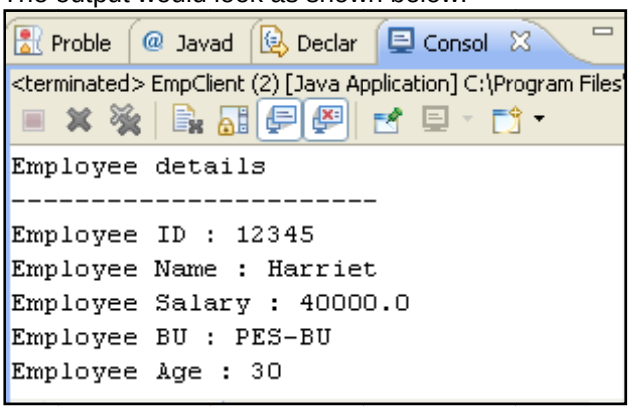
Lab 1. Injecting dependencies into a Spring application

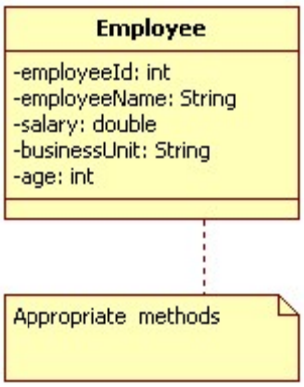
Goals	• Using IoC to integrate disparate systems in a loosely coupled manner.
Time	180 minutes

Problem statement-1.1: Injecting dependencies

Write an Employee bean. Inject values into bean using DI and display all values. Refer the class diagram below

The output would look as shown below:



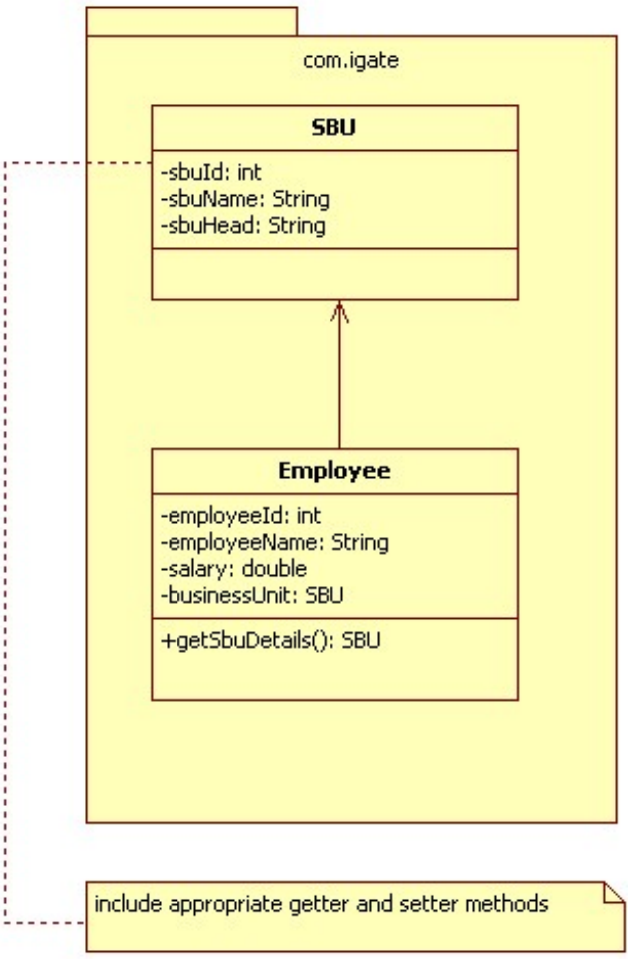


Class Diagram 1: Employee

Keep each of the lab solutions separate, preferably in different packages/source folders

Problem statement-1.2: Injecting dependencies

Code SBUbean.Revisit the Employee bean and provide a method to retrieve SBU details (getSBUDetails()) for the employee. You will need to inject the SBU bean to the Employee bean as shown in the Class diagram below:



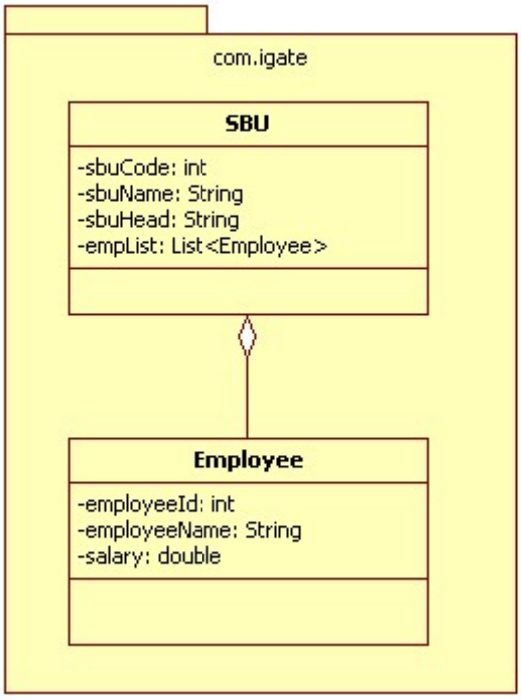
Class Diagram 2: **SBU and Employee**

The output would look as shown below:

```
Problems  Javadoc  Declaration  Console
<terminated> EmpClient (3) [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Feb 20, 2012 4:30:57 PM)
Employee details
------------------------
Employee [empAge=40, empId=12345, empName=Harriet, empSalary=40000.0
sbu details=SBU [sbuCode=PES-BU, sbuHead=Kiran Rao, sbuName=Product Engineering Services]]
```

Problem statement-1.3: Injecting dependencies

Revisit the SBU bean. Create a new property called empList which will contain a list of all employees in the PES BU. Display the SBU details, followed by a list of all employees in that BU. To inject employee objects into the SBU bean, use "List" collection. Allocate two employees to PES. Refer Class diagram below



Class Diagram 3: **SBU and Employee (Ver -2)**

The output would look as shown below:

```
Problems  Javadoc  Declaration  Console
<terminated> EmpClient (4) [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Feb 20, 2012 4:53:43 PM)
SBU details
-----------------------
sbuCode=PES-BU, sbuHead=Kiran Rao, sbuName=Product Engineering Services
 Employee details:---------------
[Employee [empAge=30, empId=12345, empName=Harriet, empSalary=40000.0], Employee [empAge=30, empId=12346
```

Problem statement-1.4: Injecting dependencies

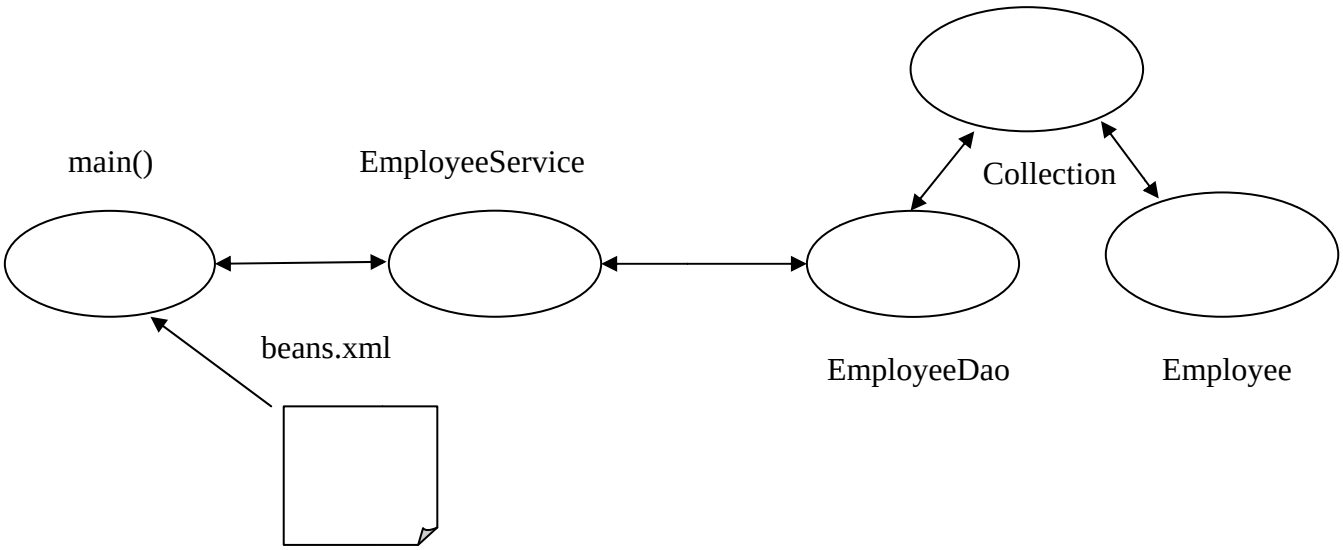
Develop a console based spring application where main method of client class will retrieve employee information from Employee collection and displays info in the console as shown:

Input:
Employee ID : 100

Output:
Employee Info:
Employee ID :100
Emplpoyee NAME :Rama

Employee SALARY :12345.67

Refer diagram below for implementation details:



Flow Diagram - 1

Note: implement above application using

- Setter Injection
- Constructor Injection (use index and type attribute with constructor arg tag)
- Use different bean wiring mechanism like..
  - By Name
  - By Type
  - Auto Wiring

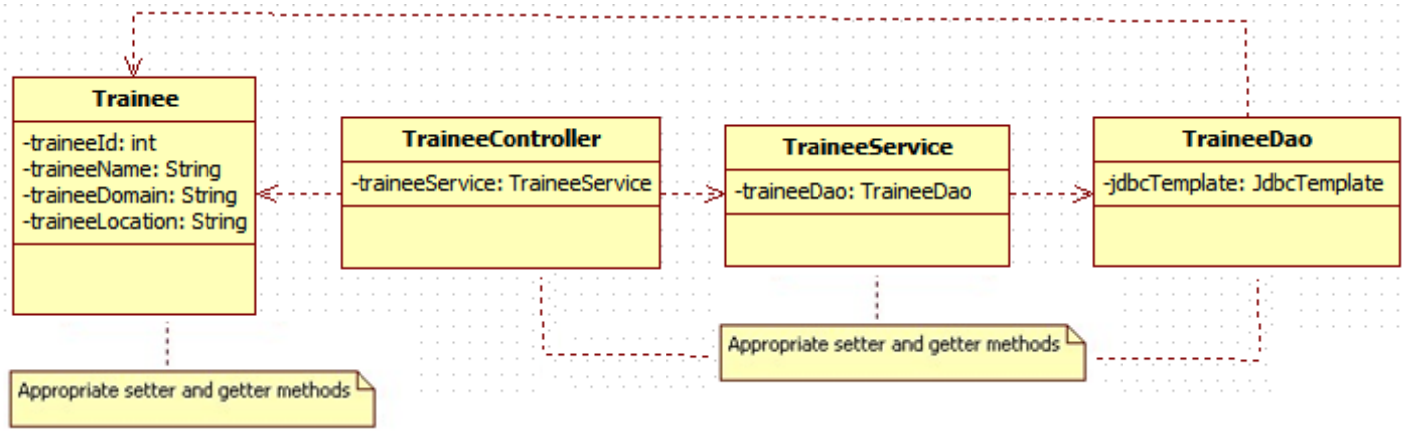
Change Request: Now Change the application so that all components are autowired and components are automatically scanned.Use Spring boot API.

Lab 2. Spring MVC and JPA

Goals	• Demonstrate Spring's MVC framework • Integrate Spring and JPA
Time	180 minutes

Version -1:

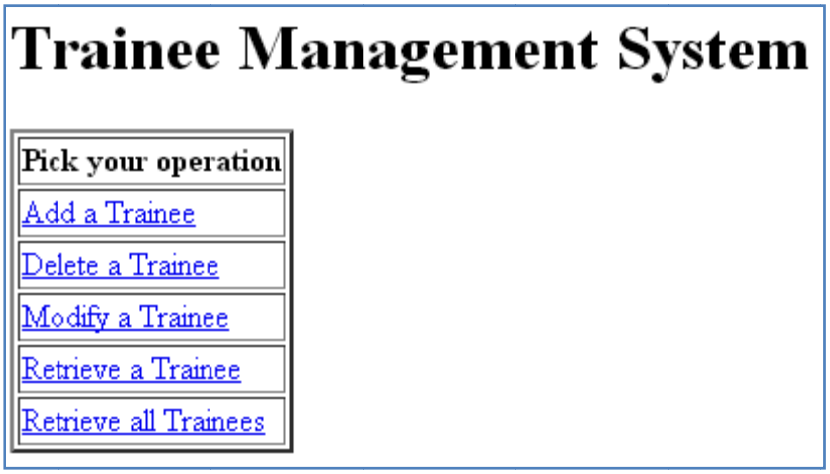
Develop a Spring MVC based application to manage list of trainees by an admin. Refer the class diagram below to develop required classes.



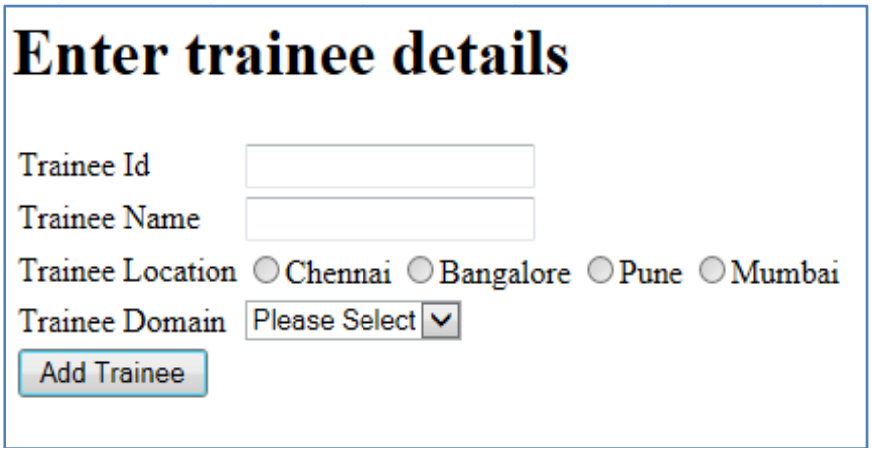
Class Diagram 4**: Trainee related Classes**

Initially when the application is deployed login page should come up as shown below.

Administrator will enter valid credentials to go to the page shown below.

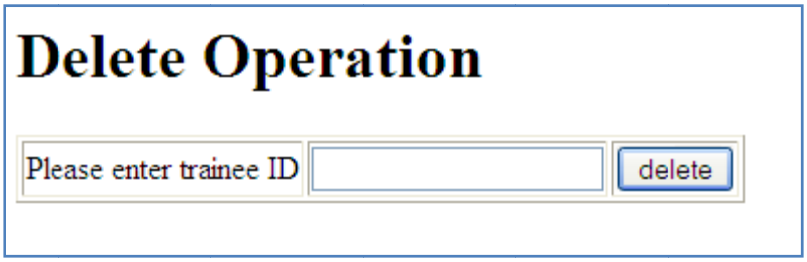


Admin select add hyperlink to add a new trainee. The following page shows up.

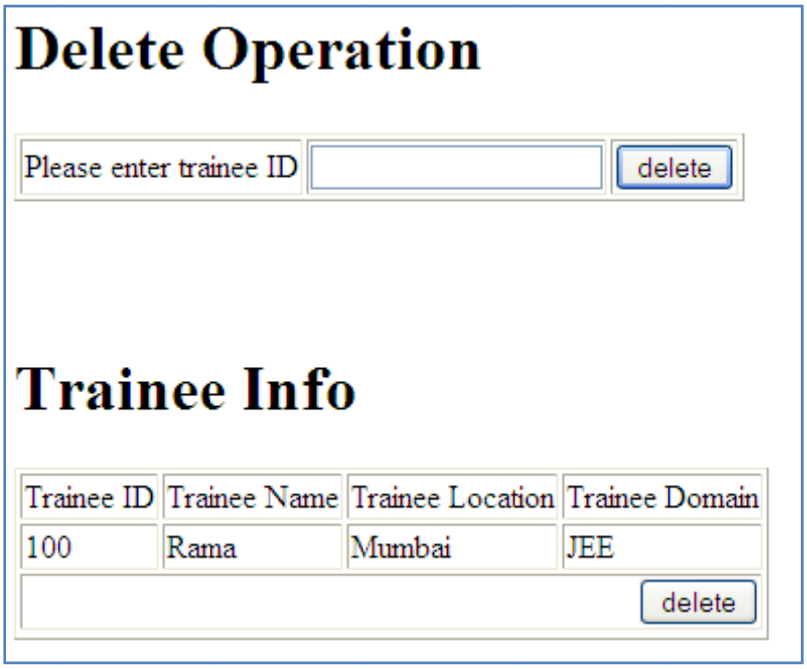


After entering trainee details admin will submit, to insert trainee info into database.

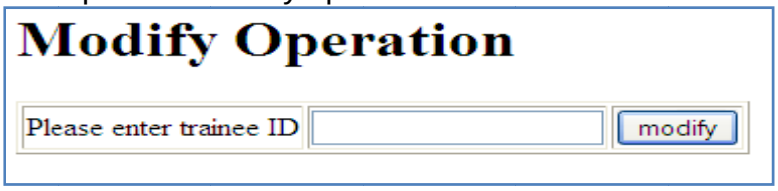
If admin selects delete operation refer the following screen shots to design your application.



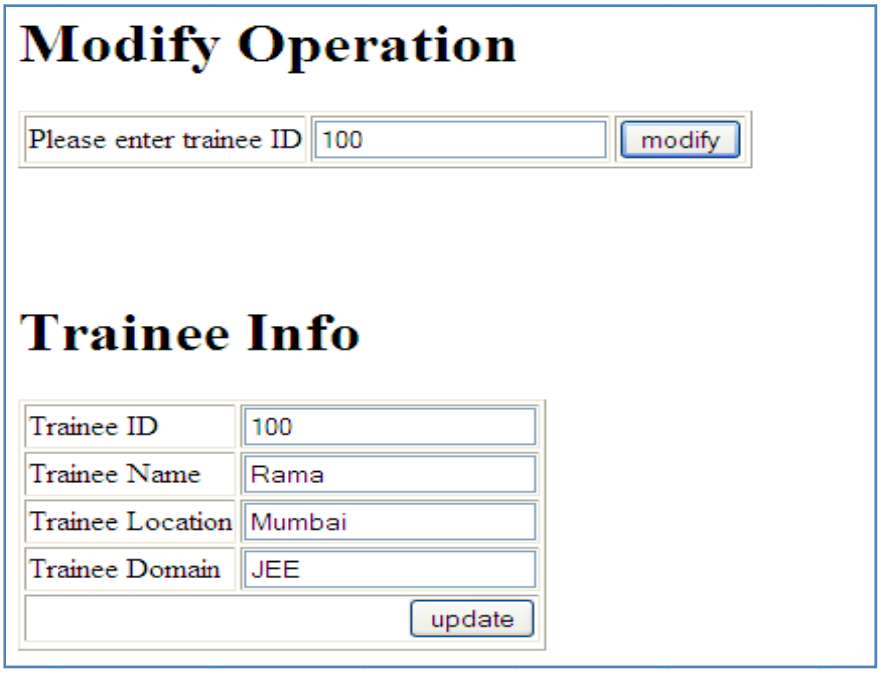
After entering trainee ID in the same page trainee info will be displayed as shown below



To implement modify operation on trainee info refer the following list of screen shots.

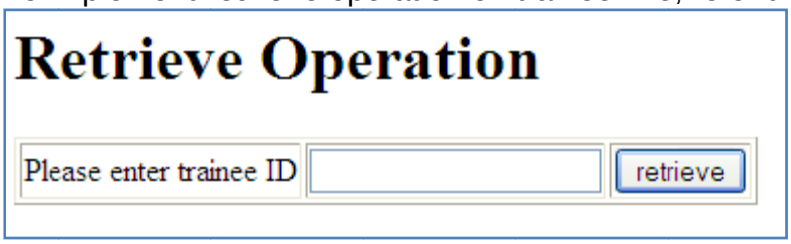


When admin enters trainee id, in the same page trainee info will be retrieved for modification as shown below in the screen shot



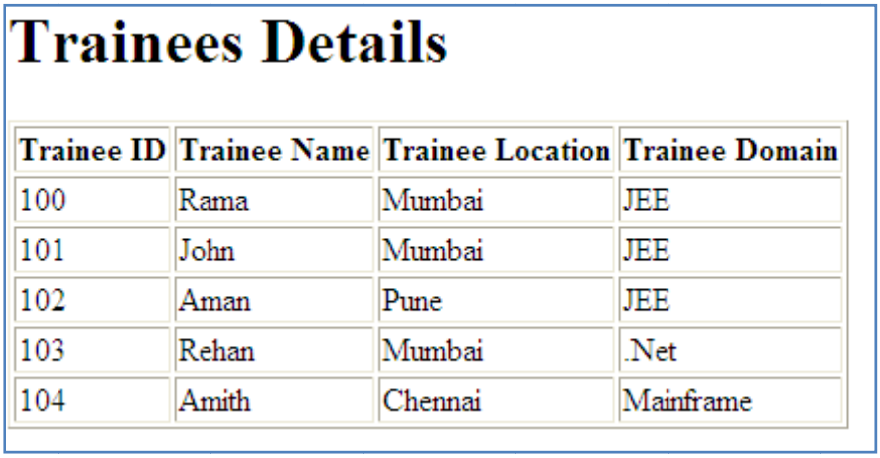
After making appropriate entry admin will click update button to reflect changes in Trainee table.

To implement **retrieve** operation on trainee info, refer the following list of screen shots.



When admin enters trainee id, trainee info will be displayed in the same page as shown below in the screen shot.

Admin selects *'retrieve all'* link to retrieve all trainee info as shown below in the screen shot



Note:

1. Perform appropriate validations on each field for all admin operations including login page
2. If any operation fails admin should be redirected to appropriate error page

Lab 3. Injecting cross-cutting concerns

Goals	• Using AOP
Time	30 minutes

Using spring and AOP

Refer to Trainee Management System created in the previous lab, implement logging using spring AOP. Logging should take care recording all the admin operations with the timestamp.

Ex: If admin executes inserting new trainee record into database, the logging should log that info in a file called adminoperations.log as shown below:

2013-05-28 09:04:39 INFO Admin executed Add Trainee operation.

Appendices

Appendix A: Class Diagrams

Class Diagram 1: Employee 5
Class Diagram 2: **SBU and Employee** 6
Class Diagram 3: **SBU and Employee (Ver -2)** 7
Class Diagram 4**: Trainee related Classes** 9

