Case Study Lab

In this lab, you will write a complete JEE web application that uses most of the techniques you learned in the class. We do not expect you to finish this lab in the time allotted, but you should be able to architect the system and start working on it.

Here's the situation. You work in Information Technology for *Bike Trails Forever*, a large, non-profit organization that accepts donations from individuals. In the past, BTF has used a PC-based system to keep a record of donations, but in this day and age, the officers are demanding a new, Web-based solution. You have been given the job of creating such a system using JEE and a database.

Here are the specifications:

- For each donation, you must track the date and amount, as well as the donor's name and address information
- A single individual might make several donations over time -- your program needs to track each one separately
- Your database analyst has recommended using two database tables related by a *foreign key*. One table will hold the name information and the other will store the donation information. To relate the tables, the donation table should store a foreign key to the name table
- Your goal is to design a single-page Web application that uses Spring and RESTful services on the server side and a JavaScript library such as jQuery and Ajax on the client. The page should list all of the donors in a table and all of the donations for a given donor in a separate table. You should also provide an input form to enter a new donation and associate it with a donor.

Note to the instructor: it's useful to do the design part of this lab (Step One below) as a group activity. Divide the class into small groups (three or four students each) and have each group come up with a design. Then optionally have each group present their design in front of the class.

Objectives:

- To design and implement a JEE web application from scratch

Steps:

_1. Before you start banging out code, you should spend some up-front time on the design and architecture of your system. Here's what we recommend (not necessarily in this order):

   - Sketch out your HTML screens and storyboard the sequence of how they will work.
   - Sketch out what columns the database tables should have.
   - Do some object-oriented analysis and design to come up with the domain class(es) that you will need for the model. What will their attributes and methods look like?
   - Think about what Spring beans and DAOs that your program will need. What RESTful services will you need?
   - Think about how transactions should work.
   - Write some pseudo-code (or better yet, a UML interaction diagram) for each use of the system that you will implement. Think about what actions you will need to perform on the database for each use (e.g. insert versus update).

_2. Since the goal of this lab is to let you practice the techniques you learned in class, this lab guide will not give you step-by-step instructions as in earlier labs.

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_3. You will need to define a database table to hold the data. Use the SQL scripts from previous labs as inspiration. You will also need to create the database and a JNDI data source.

_4. Good luck!

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