Part 1

Steps

- 1. I created class structures for both the book and the category
- 2. I created a bean file to create instances of category using book beans. Some books were created as books and passed as reference to the category bean, and others were created in-line.
- 3. I created three different instances to show off the three different structures: Map, List, and Set.

Tests

```
16:32:42.259 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Finished creating instance of beam 'com.rseg.assignment1.JDBC.Models.Book# 16:32:42.251 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Finished creating instance of beam 'com.rseg.assignment1.JDBC.Models.Book# 16:32:42.252 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Finished creating instance of beam 'History' 16:32:42.252 [main] DEBUG org.springframework.context.support.DefaultListableBeanFactory - Returning cached instance of singleton beam 'lifecycleProcessor': using defa 16:32:42.253 [main] DEBUG org.springframework.context.support.DefaultListableBeanFactory - Returning cached instance of singleton beam 'lifecycleProcessor' 16:32:42.259 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning cached instance of singleton beam 'Java' 16:32:42.259 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning cached instance of singleton beam 'Fiction' 16:32:42.259 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning cached instance of singleton beam 'History' - Books Set Output Start - Books Map Output Start - Books Map
```

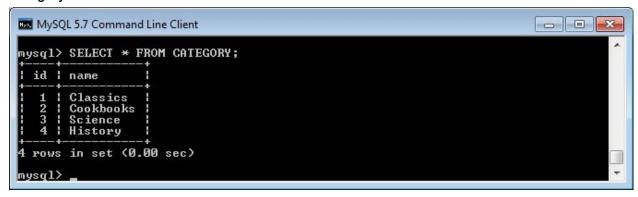
Part 2

Steps

1. I built a database with category and book tables. They looks like this: *Book:*

```
- - X
MySQL 5.7 Command Line Client
mysql> SELECT * FROM BOOK;
 id
      category_id | isbn
                                 ! title
                                                                                 \mathbf{p}
                 3 | 0374715718 | The Zoomable Universe
                 3 | 1426218648 | View From Above
                 3 | 0545947197 | Rocks, Minerals & Gems
                 1 | 0743273567 | The Great Gatsby
                 1 | 0060935464 | To Kill a Mockingbird
                 2 | 0393081087 | The Food Lab
                 4 | 1494861992 | The Egyptian Origins of Western Philosophy |
 rows in set (0.00 sec)
mysql>
```

Category:



- 2. I then created a Model interface and two extensions pertaining to each table.
- 3. I created a DAO class and a bean to create the data source.
- 4. Using the beans, I injected the data source into the DAO and created a jdbcTemplate and a NamedParameterdjbcTemplate (for use with some queries later).
- 5. I then created CRUD classes to wrap around the DAO and access the database along with row mappers for both the Category and Book tables.
- 6. Packaging it all together, I created methods to Get All Books and Categories, Get Book by a Category name (I took "name" to imply the name of the category *not* the id), and Update, Insert and Delete a Book. With the exception of the "Get All" actions, I used the NamedParameterjdbcTemplate to access all data.
- 7. I then wrapped all of that to create my Main function which tests these drivers.

Tests

Get All Books

```
08:56:41.353 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing SQL query [select category_id 08:56:41.356 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection from 08:56:41.356 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Driv Tue Oct 31 08:56:41 EDT 2017 WARN: Establishing SSL connection without server's identity verification is not of 08:56:41.598 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Description of Debug org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Description of Debug org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Description of Debug org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Debug org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Debug org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to Debug org.springframework.context.support.DataSourceUtils - Returning SQL query ID: 1)

(ID: 1, ISBN: 0374715718, Title: 'The Zoomable Universe', Price: 18.5, Category ID: 1)

(ID: 2, ISBN: 1426218648, Title: 'View From Above', Price: 27.19, Category ID: 3)

(ID: 3, ISBN: 0545947197, Title: 'Rocks, Minerals & Gems', Price: 13.99, Category ID: 3)

(ID: 4, ISBN: 0743273567, Title: 'The Great Gatsby', Price: 12.0, Category ID: 1)

(ID: 5, ISBN: 0960935464, Title: 'To Kill a Mockingbird', Price: 5.89, Category ID: 1)

(ID: 6, ISBN: 0393081087, Title: 'The Food Lab', Price: 30.97, Category ID: 2)

(ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9.95, Category ID: 4)

08:56:41.600 [main] INFO org.springframework.context.support.GenericXmlApplicationContext - Closing org.spring 08:56:41.601 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning category ID: 10.000 [main] DEBUG org.springframework.beans.factory.support.D
```

```
- - X
MySQL 5.7 Command Line Client
: id
       category_id | isbn
                                 ! title
                                                                               H
                                                                                p
rice
                 1 | 0374715718 | The Zoomable Universe
                 3 | 1426218648 | View From Above
                 3 | 0545947197 | Rocks, Minerals & Gems
                                                                                1
                 1 | 0743273567 | The Great Gatsby
                                                                                1
                 1 | 0060935464 | To Kill a Mockingbird
                 2 | 0393081087 | The Food Lab
                 4 | 1494861992 | The Egyptian Origins of Western Philosophy |
 rows in set (0.00 sec)
                                                                                  Ε
mysql>
```

Get All Categories

```
mysql> SELECT * FROM CATEGORY;

id | name |
| 1 | Classics |
| 2 | Cookbooks |
| 3 | Science |
| 4 | History |
| 4 rows in set (0.00 sec)
```

Update Book (Updating ID 1 to \$20.00 and adjusting title)

```
private static void TestUpdateBook()
         GenericXmlApplicationContext ctx = new GenericXmlApplicationContext();
         ctx.load("classpath:META-INF/JDBC.xml");
         ctx.refresh();
         Book b = new Book();
         b.setCategoryid(1);
         b.setId((long)1);
         b.setIsbn("0374715718");
         b.setPrice((float)20.00);
         b.setTitle("The Zoomable Universe: Sequel");
         BookCRUD BookOperations = ctx.getBean("BookCRUD", BookCRUD.class);
         BookOperations.Print(BookOperations.GetAll(), true, "------
         BookOperations.Update((long)1, b);
         BookOperations.Print(BookOperations.GetAll(), true, "--------
         ctx.close();
  }
08:42:31.463 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing SQL query [select category 08:42:31.468 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection fr
08:42:31.469 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Dri
08:42:31 727 [main] DEBUG org springframework idbo datasource DataSourceUtils - Returning IDBC Connection to
         ------Getting Books Before Update------
 (ID: 1, ISBN: 0374715718, Title: 'The Zoomable Universe', Price: 18.3, Category ID: 3)
(ID: 2, ISBN: 1426218648, Title: 'View From Above', Price: 27.19, Category ID: 3)
(ID: 3, ISBN: 0545947197, Title: 'Rocks, Minerals & Gems', Price: 13.99, Category ID: 3)
(ID: 4, ISBN: 0743273567, Title: 'The Great Gatsby', Price: 12.0, Category ID: 1)
(ID: 5, ISBN: 0743273367, Title: The Great databy , Frice: 12.0, Category 10. 1)
(ID: 5, ISBN: 0060935464, Title: 'To Kill a Mockingbird', Price: 5.89, Category ID: 1)
(ID: 6, ISBN: 0393081087, Title: 'The Food Lab', Price: 30.97, Category ID: 2)
(ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9.95, Category ID: 4)
08:42:31.739 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing prepared SQL update
08:42:31.741 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing prepared SQL statement [upda 08:42:31.741 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection from
08:42:31.741 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Dri
08:42:31.877 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - SQL update affected 1 rows
08:42:31.879 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to
08:42:31.880 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing SQL query [select category i
08:42:31.880 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection from 08:42:31.880 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Dri
                             BEBUG org.springrrumework.jube.ducasearde
(ID: 1, ISBN: 0374715718, Title: 'The Zoomable Universe: Sequel', Price: 20.0, Category ID: 1)
(ID: 2, ISBN: 1426218648, Title: 'View From Above', Price: 27.19, Category ID: 3)
(ID: 3, ISBN: 0545947197, Title: 'Rocks, Minerals & Gems', Price: 13.99, Category ID: 3)
(ID: 4, ISBN: 0743273567, Title: 'The Great Gatsby', Price: 12.0, Category ID: 1)
(ID: 5, ISBN: 0060935464, Title: 'To Kill a Mockingbird', Price: 5.89, Category ID: 1)
(ID: 6, ISBN: 0393081087, Title: 'The Food Lab', Price: 30.97, Category ID: 2)
(ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9 95 Category ID: 2)
 (ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9.95, Category ID: 4)
```

```
MySQL 5.7 Command Line Client
                                                                      l p
      category_id | isbn
                                | title
rice
                 1 | 0374715718 | The Zoomable Universe: Sequel
                                                                             1 2
                 3 | 1426218648 | View From Above
                                                                             1 2
                 3 | 0545947197 | Rocks, Minerals & Gems
                 1 | 0743273567 | The Great Gatsby
                                                                             1 1
                 1 | 0060935464 | To Kill a Mockingbird
                 2 | 0393081087 | The Food Lab
                                                                             1 3
                 4 | 1494861992 | The Egyptian Origins of Western Philosophy |
 rows in set (0.00 sec)
                                                                                111 +
mysq1>
```

```
Delete Book (Deleted ID 1):
 private static void TestDeleteBook()
       GenericXmlApplicationContext ctx = new GenericXmlApplicationContext();
       ctx.load("classpath:META-INF/JDBC.xml");
       ctx.refresh();
       BookCRUD BookOperations = ctx.getBean("BookCRUD", BookCRUD.class);
       BookOperations.Print(BookOperations.GetAll(), true, "------
       BookOperations.Delete((long)1);
       BookOperations.Print(BookOperations.GetAll(), true, "------
       ctx.close();
08:49:23.782 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning co
08:49:23.784 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing SQL query [select category
08:49:23.789 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection fro
08:49:23.789 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Dr
  -----Getting Books Before Deletion-----
 (ID: 1, ISBN: 0374715718, Title: 'The Zoomable Universe: Sequel', Price: 20.0, Category ID: 1)
(ID: 2, ISBN: 1426218648, Title: 'View From Above', Price: 27.19, Category ID: 3)
(ID: 3, ISBN: 0545947197, Title: 'Rocks, Minerals & Gems', Price: 13.99, Category ID: 3)
(ID: 4, ISBN: 0743273567, Title: 'The Great Gatsby', Price: 12.0, Category ID: 1)
(ID: 5, ISBN: 0060935464, Title: 'To Kill a Mockingbird', Price: 5.89, Category ID: 1)
(ID: 6, ISBN: 0393081087, Title: 'The Food Lab', Price: 30.97, Category ID: 2)
(ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9.95, Category ID: 4)
08:49:24.033 [main] DEBUG org.springtramework.jdbc.core.JdbcTemplate - Executing prepared SQL update
08:49:24.035 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing prepared SQL statement [DEL
08:49:24.035 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection from
08:49:24.035 [main] DEBUG org.springframework.jdbc.datasource.DriverManagerDataSource - Creating new JDBC Dr
08:49:24.113 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - SQL update affected 1 rows
08:49:24.114 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to
08:49:24.114 [main] DEBUG org.springframework.jdbc.core.JdbcTemplate - Executing SQL query [select category_ 08:49:24.115 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Fetching JDBC Connection fro
 38:49:24.158 [main] DEBUG org.springframework.jdbc.datasource.DataSourceUtils - Returning JDBC Connection to
  -----Getting Books After Deletion------
 (ID: 2, ISBN: 1426218648, Title: 'View From Above', Price: 27.19, Category ID: 3)
(ID: 3, ISBN: 0545947197, Title: 'Rocks, Minerals & Gems', Price: 13.99, Category ID: 3)
 (ID: 4, ISBN: 0743273567, Title: 'The Great Gatsby', Price: 12.0, Category ID: 1)
(ID: 5, ISBN: 0060935464, Title: 'To Kill a Mockingbird', Price: 5.89, Category ID: 1)
(ID: 6, ISBN: 0393081087, Title: 'The Food Lab', Price: 30.97, Category ID: 2)
 (ID: 7, ISBN: 1494861992, Title: 'The Egyptian Origins of Western Philosophy', Price: 9.95, Category ID: 4)
08:49:24.159 [main] INFO org.springframework.context.support.GenericXmlApplicationContext - Closing org.spri
08:49:24.159 [main] DEBUG org.springframework.core.env.PropertySourcesPropertyResolver - Found key 'spring.l
08:49:24.159 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning co
08:49:24.159 [main]
                        DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Destroying
```

```
MySQL 5.7 Command Line Client
                                                                        - - X
mysq1 > SELECT * FROM BOOK;
l id
rice
     | category_id | isbn
                                 ! title
                                                                               ÷
                 3 | 1426218648 | View From Above
                 3 | 0545947197 | Rocks, Minerals & Gems
                 1 | 0743273567 | The Great Gatsby
                 1 | 0060935464 | To Kill a Mockingbird
                 2 | 0393081087 | The Food Lab
                 4 | 1494861992 | The Egyptian Origins of Western Philosophy |
 rows in set (0.00 sec)
                                                                                   Ε
mysq1>
```

Insert Book (Inserting the original ID 1 book)

```
88:53:23.133 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Returning cached 88:53:23.134 [main] DEBUG org.springframework.jdbc.datasource.DataSourcetting SQL query [select category_id, id 88:53:23.139 [main] DEBUG org.springframework.jdbc.datasource.DataSourcetting SQL query [select category_id, id 88:53:23.139 [main] DEBUG org.springframework.jdbc.datasource.DriverNanagerDataSource - Creating new JDBC DriverNanagerDataSource - Creating new JDBC DriverNanagerDataSourcetting SQL connection without server's identity verification is not recomposition of the control of
```

```
MySQL 5.7 Command Line Client
                                                                       .
| id | category_id | isbn
                                ! title
                                                                              H
                                                                               p
rice !
                 1 | 0374715718 | The Zoomable Universe
                3 | 1426218648 | View From Above
                                                                              H
                                                                               2
                3 | 0545947197 | Rocks, Minerals & Gems
                                                                               1
                1 | 0743273567 | The Great Gatsby
                                                                               1
                                                                              .
                1 | 0060935464 | To Kill a Mockingbird
                2 | 0393081087 | The Food Lab
                                                                              1 3
                4 | 1494861992 | The Egyptian Origins of Western Philosophy |
 rows in set (0.00 sec)
                                                                                 Ε
mysq1>
```