Library DAO Tutorial

Step 4: Creating the Database

SOFTWARE GUILD

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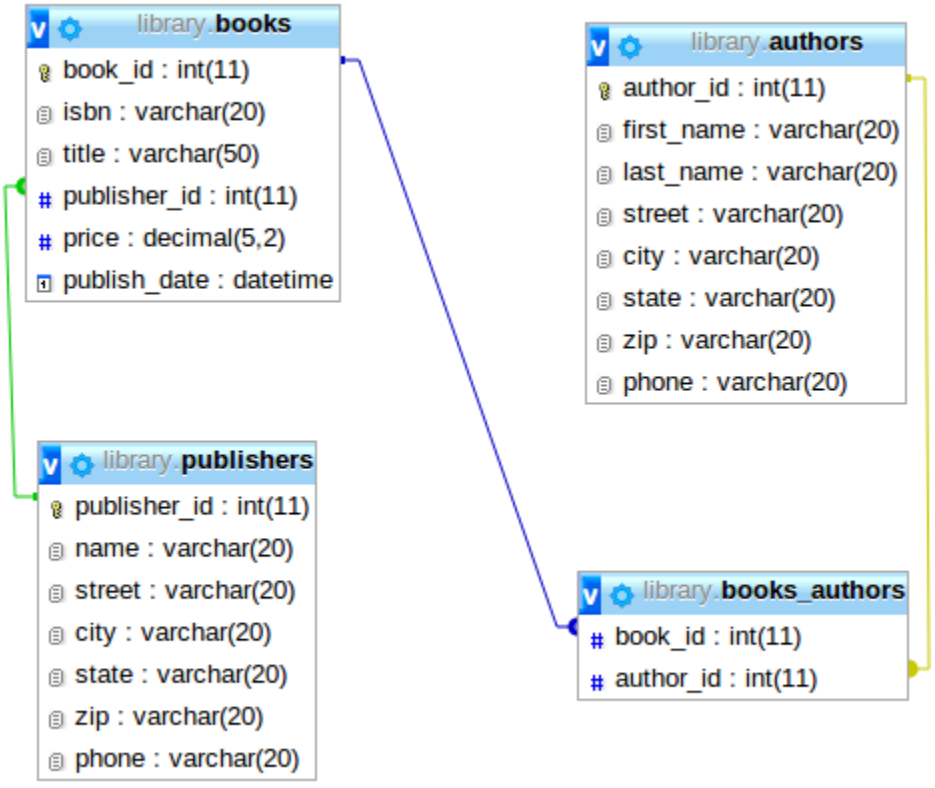
Step 4: Creating the Database

Overview

In this step, we will create the database for our library. Our database will consist of four tables as in the following diagram:



Note the FK constraints in books.publisher_id back to publishers.publisher_id, books_authors.book_id back to books.book_id, and books_authors.author_id back to authors.author_id.

The books.publisher_id column and FK constraint represents the many-to-one relationship between Publishers and Books (publishers may publish many books but a book can have only one publisher). The books_authors table and related FK constraints represent the many-to-many relationship between Books and Authors (books can have many authors and authors can write many books).

SQL Script

Run the following SQL script to create your database:

```
-- phpMyAdmin SQL Dump
-- version 4.0.6deb1
-- http://www.phpmyadmin.net
--
-- Host: localhost
-- Generation Time: Jun 17, 2014 at 02:54 PM
-- Server version: 5.5.37-0ubuntu0.13.10.1
-- PHP Version: 5.5.3-1ubuntu2.3

SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
SET time_zone = "+00:00";


/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8 */;

--
-- Database: `library`
--

-- --------------------------------------------------------

--
-- Table structure for table `authors`
--

CREATE TABLE IF NOT EXISTS `authors` (
  `author_id` int(11) NOT NULL AUTO_INCREMENT,
  `first_name` varchar(20) NOT NULL,
  `last_name` varchar(20) NOT NULL,
  `street` varchar(20) NOT NULL,
  `city` varchar(20) NOT NULL,
  `state` varchar(20) NOT NULL,
  `zip` varchar(20) NOT NULL,
  `phone` varchar(20) NOT NULL,
  PRIMARY KEY (`author_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=1 ;

-- --------------------------------------------------------
```

```
--
-- Table structure for table `books`
--

CREATE TABLE IF NOT EXISTS `books` (
  `book_id` int(11) NOT NULL AUTO_INCREMENT,
  `isbn` varchar(20) NOT NULL,
  `title` varchar(50) NOT NULL,
  `publisher_id` int(11) NOT NULL,
  `price` decimal(5,2) NOT NULL,
  `publish_date` datetime NOT NULL,
  PRIMARY KEY (`book_id`),
  KEY `publisher_id` (`publisher_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=1 ;

-- --------------------------------------------------------

--
-- Table structure for table `books_authors`
--

CREATE TABLE IF NOT EXISTS `books_authors` (
  `book_id` int(11) NOT NULL,
  `author_id` int(11) NOT NULL,
  KEY `book_id` (`book_id`),
  KEY `author_id` (`author_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

-- --------------------------------------------------------

--
-- Table structure for table `publishers`
--

CREATE TABLE IF NOT EXISTS `publishers` (
  `publisher_id` int(11) NOT NULL AUTO_INCREMENT,
  `name` varchar(20) NOT NULL,
  `street` varchar(20) NOT NULL,
  `city` varchar(20) NOT NULL,
  `state` varchar(20) NOT NULL,
  `zip` varchar(20) NOT NULL,
  `phone` varchar(20) NOT NULL,
  PRIMARY KEY (`publisher_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=1 ;
```

```
--
-- Constraints for dumped tables
--

--
-- Constraints for table `books`
--
ALTER TABLE `books`
  ADD CONSTRAINT `books_ibfk_1` FOREIGN KEY (`publisher_id`) REFERENCES `publishers`
(`publisher_id`) ON DELETE NO ACTION;

--
-- Constraints for table `books_authors`
--
ALTER TABLE `books_authors`
  ADD CONSTRAINT `books_authors_ibfk_1` FOREIGN KEY (`book_id`) REFERENCES `books`
(`book_id`) ON DELETE NO ACTION,
  ADD CONSTRAINT `books_authors_ibfk_2` FOREIGN KEY (`author_id`) REFERENCES `authors`
(`author_id`) ON DELETE NO ACTION;

/*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
/*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
/*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;
```

Wrap-up

In this step, we did the following:

1. Created the database.
2. Reviewed the many-to-one relationship between Publishers and Books.
3. Reviewed the many-to-many relationship between Books and Authors.

In the next step, we will implement the JdbcTemplate version of our DAO.