Pre-Class Assignment

Hibernate

One of the tricky tasks that you may come across as a Software Engineer is how to store objects into a relational database (Like MySQL). Some objects that would be hard to store in a relational database might be objects that contain other objects, Maps, or Trees. Hibernate is an object-relational mapping (ORM) framework for Java that maps Java Objects to and from a relational database. We will use it in class to map a generic Java Object to and from a MySQL Database. Read the articles below to discover what Hibernate is, how it works, and how to set it up.

SQL vs NoSQL

The first step to understand why Hibernate is useful is to understand what a relational database is. Read the article from the link below and learn the difference between SQL and NoSQL Databases.

- https://www.upwork.com/hiring/data/sql-vs-nosql-databases-whats-the-difference/ (6 pages)
- https://blog.timescale.com/blog/why-sql-beating-nosql-what-this-means-for-future-of-data-time-series-database-348b777b847a/ (9 pages)

Hibernate Overview

Click the links below and read the following sections. This site will teach you a high-level overview of Hibernate and how it works. (8 pages)

- https://www.tutorialspoint.com/hibernate/hibernate_overview.htm
- https://www.tutorialspoint.com/hibernate/hibernate_architecture.htm
- https://www.tutorialspoint.com/hibernate/hibernate_configuration.htm
- https://www.tutorialspoint.com/hibernate/hibernate_persistent_classes.htm

Hibernate User Guide

Click the link below and read the following sections below. These will teach you the Hibernate architecture and show you an example of an annotated file. (5 pages)

- Preface
- 1. Architecture
- 4. Schema generation (stop at 4.1)

https://docs.jboss.org/hibernate/orm/5.4/userguide/html_single/Hibernate_User_Guide.html

Key Concepts

- What a relational database is.
- What an ORM is.
- Why an ORM is useful.
- What a Hibernate mapping file is.
- How to use Hibernate Annotations.
- What the architecture of Hibernate is.

Download MySQL

Click the link below and follow instructions to install MySQL on your device. MySQL is a SQL database that is easy to install for Windows, Mac, and Linux. Note that DB browser (which you may have installed from CS 240) will not work with Hibernate because Hibernate does not support SQLite. Follow the instructions for your operating system below. The general installation link for all systems is https://dev.mysql.com/doc/mysql-getting-started/en/. **Remember your username, password, and port for your MySQL server!**

For Windows

Click the link below and follow the instructions in the section called Installing and Starting MySQL under the For Windows bullet point.

- https://dev.mysql.com/doc/mysql-getting-started/en/
- **You only need to install the MySQL Server**

For Mac

Click the link below and follow the instructions to download MySQL for Mac.

- https://dev.mysql.com/doc/refman/8.0/en/osx-installation-pkg.html

To start up MySQL follow this link and look at Figure 2.18 and 2.19. Then once it is started, run this command in terminal: **/usr/local/mysql/bin/mysql -u root -p**

- https://dev.mysql.com/doc/refman/8.0/en/osx-installation-launchd.html

Follow the steps below to make sure MySQL is working before you start the in-class assignment.

1. Open MySQL Command Line Client on your computer
2. Type **create database hibernateDB;** (don't forget the semicolons)
3. Type **show databases;**

4. Make sure your terminal output lists a database called “hibernateDB”.