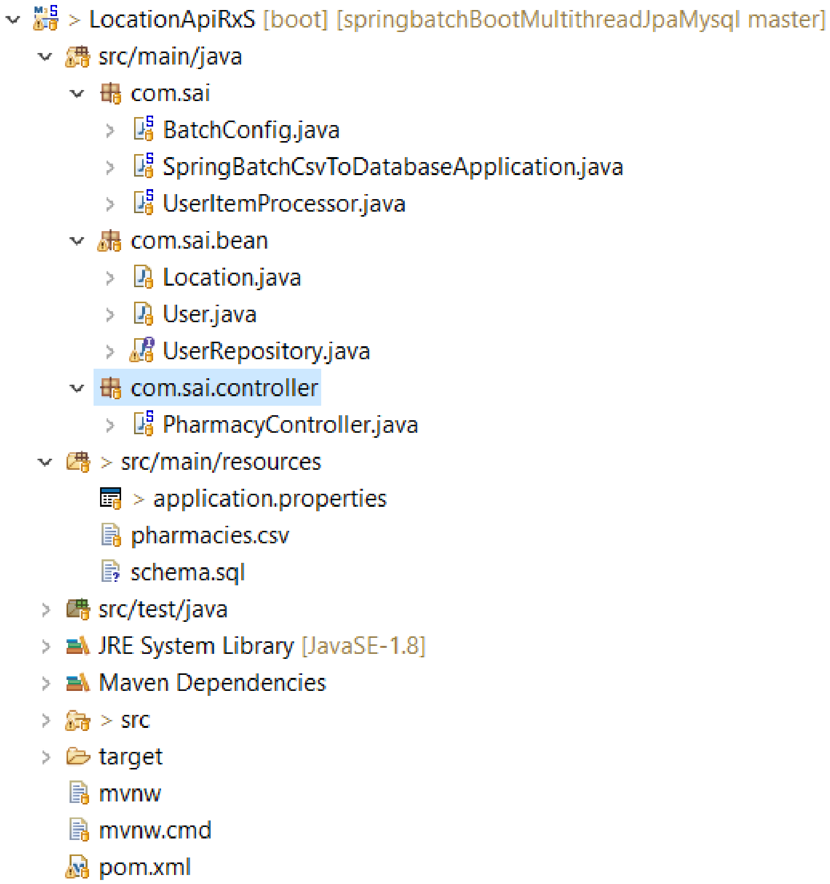
Name: Sai Krishna Reddy Mudhiganti

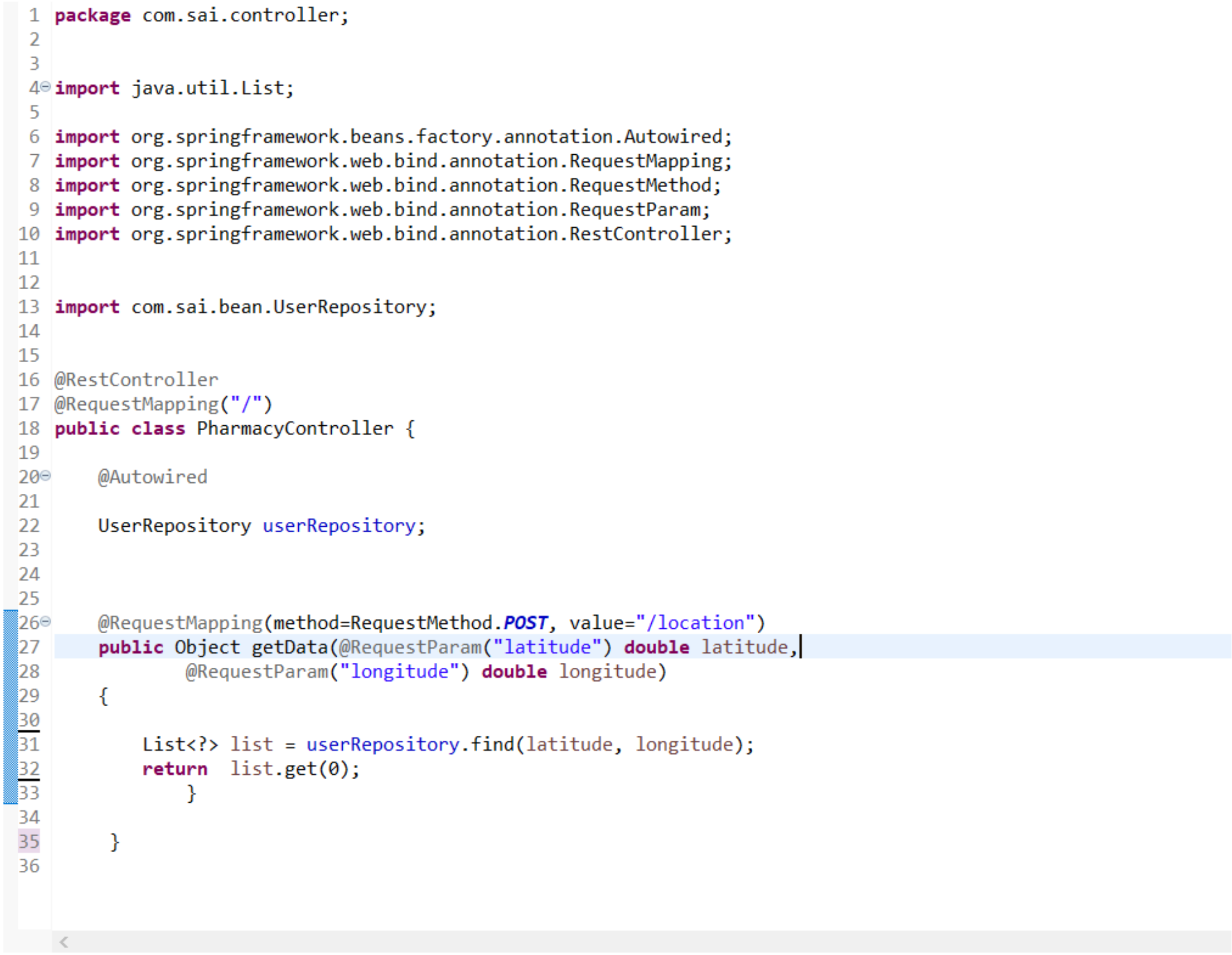
Documentation:

Folder Structure:



```
> LocationApiRxS [boot] [springbatchBootMultithreadJpaMysql master]
    src/main/java
        com.sai
            BatchConfig.java
            SpringBatchCsvToDatabaseApplication.java
            UserItemProcessor.java
        com.sai.bean
            Location.java
            User.java
            UserRepository.java
        com.sai.controller
            PharmacyController.java
    > src/main/resources
        > application.properties
        pharmacies.csv
        schema.sql
    src/test/java
    JRE System Library [JavaSE-1.8]
    Maven Dependencies
    > src
    target
    mvnw
    mvnw.cmd
    pom.xml
```

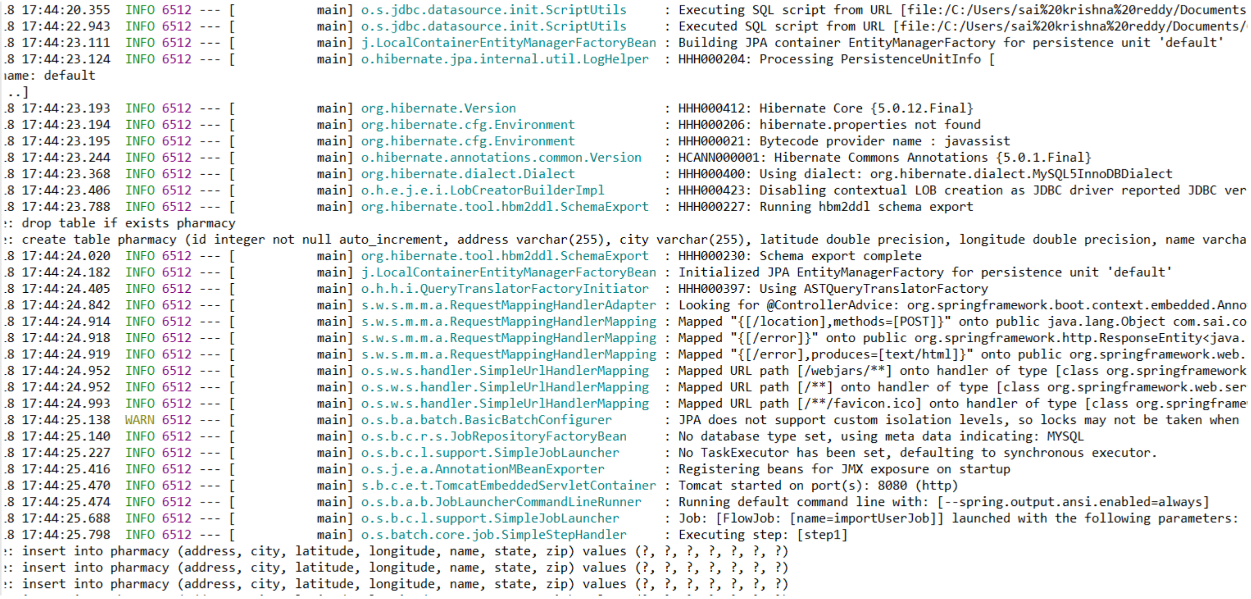
Controller:



```java
package com.sai.controller;


import java.util.List;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestMethod;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RestController;


import com.sai.bean.UserRepository;


@RestController
@RequestMapping("/")
public class PharmacyController {

    @Autowired

    UserRepository userRepository;



    @RequestMapping(method=RequestMethod.POST, value="/location")
    public Object getData(@RequestParam("latitude") double latitude,
            @RequestParam("longitude") double longitude)
    {

        List<?> list = userRepository.find(latitude, longitude);
        return  list.get(0);
            }

     }

```

RestController with single method returning the nearest pharmacy location and distance between user and pharmacy.

Console:



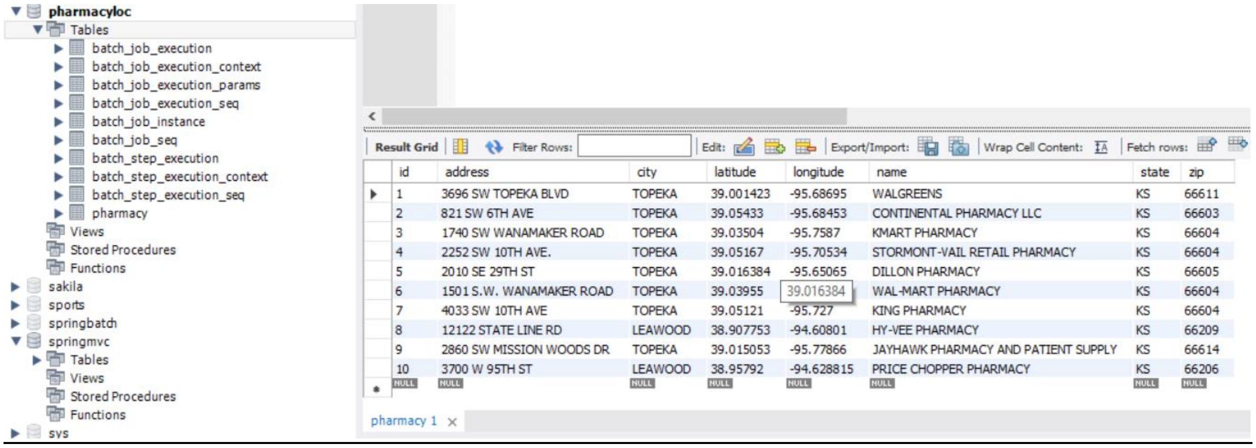
```
.8 17:44:20.355  INFO 6512 --- [           main] o.s.jdbc.datasource.init.ScriptUtils     : Executing SQL script from URL [file:/C:/Users/sai%20krishna%20reddy/Documents
.8 17:44:22.943  INFO 6512 --- [           main] o.s.jdbc.datasource.init.ScriptUtils     : Executed SQL script from URL [file:/C:/Users/sai%20krishna%20reddy/Documents/
.8 17:44:23.111  INFO 6512 --- [           main] j.LocalContainerEntityManagerFactoryBean : Building JPA container EntityManagerFactory for persistence unit 'default'
.8 17:44:23.124  INFO 6512 --- [           main] o.hibernate.jpa.internal.util.LogHelper  : HHH000204: Processing PersistenceUnitInfo [
ıame: default
 ..]
.8 17:44:23.193  INFO 6512 --- [           main] org.hibernate.Version                    : HHH000412: Hibernate Core {5.0.12.Final}
.8 17:44:23.194  INFO 6512 --- [           main] org.hibernate.cfg.Environment            : HHH000206: hibernate.properties not found
.8 17:44:23.195  INFO 6512 --- [           main] org.hibernate.cfg.Environment            : HHH000021: Bytecode provider name : javassist
.8 17:44:23.244  INFO 6512 --- [           main] o.hibernate.annotations.common.Version   : HCANN000001: Hibernate Commons Annotations {5.0.1.Final}
.8 17:44:23.368  INFO 6512 --- [           main] org.hibernate.dialect.Dialect            : HHH000400: Using dialect: org.hibernate.dialect.MySQL5InnoDBDialect
.8 17:44:23.406  INFO 6512 --- [           main] o.h.e.j.e.i.LobCreatorBuilderImpl        : HHH000423: Disabling contextual LOB creation as JDBC driver reported JDBC ver
.8 17:44:23.788  INFO 6512 --- [           main] org.hibernate.tool.hbm2ddl.SchemaExport  : HHH000227: Running hbm2ddl schema export
:: drop table if exists pharmacy
:: create table pharmacy (id integer not null auto_increment, address varchar(255), city varchar(255), latitude double precision, longitude double precision, name varcha
.8 17:44:24.020  INFO 6512 --- [           main] org.hibernate.tool.hbm2ddl.SchemaExport  : HHH000230: Schema export complete
.8 17:44:24.182  INFO 6512 --- [           main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
.8 17:44:24.405  INFO 6512 --- [           main] o.h.h.i.QueryTranslatorFactoryInitiator  : HHH000397: Using ASTQueryTranslatorFactory
.8 17:44:24.842  INFO 6512 --- [           main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.Anno
.8 17:44:24.914  INFO 6512 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/location],methods=[POST]}" onto public java.lang.Object com.sai.co
.8 17:44:24.918  INFO 6512 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.
.8 17:44:24.919  INFO 6512 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.
.8 17:44:24.952  INFO 6512 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/webjars/**] onto handler of type [class org.springframework
.8 17:44:24.952  INFO 6512 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**] onto handler of type [class org.springframework.web.ser
.8 17:44:24.993  INFO 6512 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframe
.8 17:44:25.138  WARN 6512 --- [           main] o.s.b.a.batch.BasicBatchConfigurer       : JPA does not support custom isolation levels, so locks may not be taken when
.8 17:44:25.140  INFO 6512 --- [           main] o.s.b.c.r.s.JobRepositoryFactoryBean     : No database type set, using meta data indicating: MYSQL
.8 17:44:25.227  INFO 6512 --- [           main] o.s.b.c.l.support.SimpleJobLauncher      : No TaskExecutor has been set, defaulting to synchronous executor.
.8 17:44:25.416  INFO 6512 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
.8 17:44:25.470  INFO 6512 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
.8 17:44:25.474  INFO 6512 --- [           main] o.s.b.a.b.JobLauncherCommandLineRunner   : Running default command line with: [--spring.output.ansi.enabled=always]
.8 17:44:25.688  INFO 6512 --- [           main] o.s.b.c.l.support.SimpleJobLauncher      : Job: [FlowJob: [name=importUserJob]] launched with the following parameters:
.8 17:44:25.798  INFO 6512 --- [           main] o.s.batch.core.job.SimpleStepHandler     : Executing step: [step1]
:: insert into pharmacy (address, city, latitude, longitude, name, state, zip) values (?, ?, ?, ?, ?, ?, ?)
:: insert into pharmacy (address, city, latitude, longitude, name, state, zip) values (?, ?, ?, ?, ?, ?, ?)
:: insert into pharmacy (address, city, latitude, longitude, name, state, zip) values (?, ?, ?, ?, ?, ?, ?)
```

In console we can see Tomcat server running on port 8080.

File schema.sql SQL script getting executed.

We can also see batch running and inserting data in to mysql database.

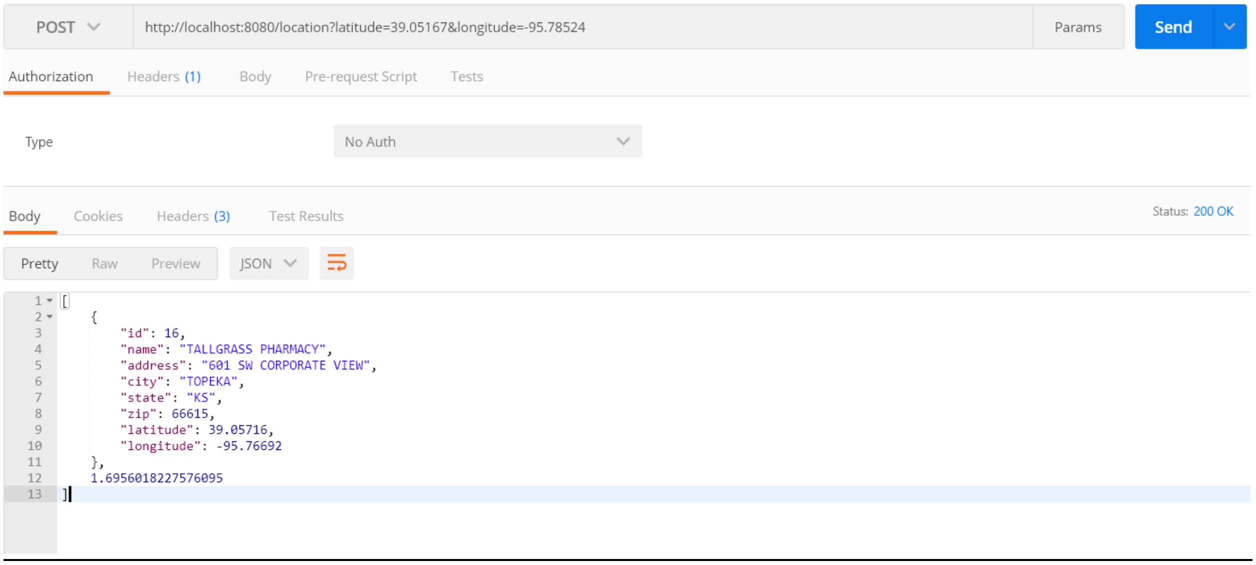
Mysql WorkBench:



id	address	city	latitude	longitude	name	state	zip
1	3696 SW TOPEKA BLVD	TOPEKA	39.001423	-95.68695	WALGREENS	KS	66611
2	821 SW 6TH AVE	TOPEKA	39.05433	-95.68453	CONTINENTAL PHARMACY LLC	KS	66603
3	1740 SW WANAMAKER ROAD	TOPEKA	39.03504	-95.7587	KMART PHARMACY	KS	66604
4	2252 SW 10TH AVE.	TOPEKA	39.05167	-95.70534	STORMONT-VAIL RETAIL PHARMACY	KS	66604
5	2010 SE 29TH ST	TOPEKA	39.016384	-95.65065	DILLON PHARMACY	KS	66605
6	1501 S.W. WANAMAKER ROAD	TOPEKA	39.03955	39.016384	WAL-MART PHARMACY	KS	66604
7	4033 SW 10TH AVE	TOPEKA	39.05121	-95.727	KING PHARMACY	KS	66604
8	12122 STATE LINE RD	LEAWOOD	38.907753	-94.60801	HY-VEE PHARMACY	KS	66209
9	2860 SW MISSION WOODS DR	TOPEKA	39.015053	-95.77866	JAYHAWK PHARMACY AND PATIENT SUPPLY	KS	66614
10	3700 W 95TH ST	LEAWOOD	38.95792	-94.628815	PRICE CHOPPER PHARMACY	KS	66206
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Tables and Data in pharmacyloc schema after running Spring Boot Application.

Response:



http://localhost:8080/location?latitude=39.05167&longitude=-95.78524

Type: No Auth

Status: 200 OK

```
[
    {
        "id": 16,
        "name": "TALLGRASS PHARMACY",
        "address": "601 SW CORPORATE VIEW",
        "city": "TOPEKA",
        "state": "KS",
        "zip": 66615,
        "latitude": 39.05716,
        "longitude": -95.76692
    },
    1.6956018227576095
]
```

Json Response with Nearest pharmacy from user & Distance in miles: 1.6956018227576095

Technologies Used:

Java 8 with Spring Boot,

JPA,

Spring Batch (for dumping excel sheet data in to mysql database).

Mysql Database,

Postman for testing.

Algorithm:

:::::Haversine formula:::::

R = earth’s radius (mean radius = 6,371km)

difflat = lat2 - lat1

difflong = long2 - long1

a = sin^2(difflat/2) + cos(lat1) x cos(lat2) x sin^2(diflong/2)

c = 2 x atan2(sqrt(a), sqrt(1-a))

d = R x c

:::::Spherical law of cosines:::::

d = acos(sin(lat1).sin(lat2)+cos(lat1).cos(lat2).cos(long2−long1)).R

Note: Please go through Readme.md file to follow the guidelines to run the application.