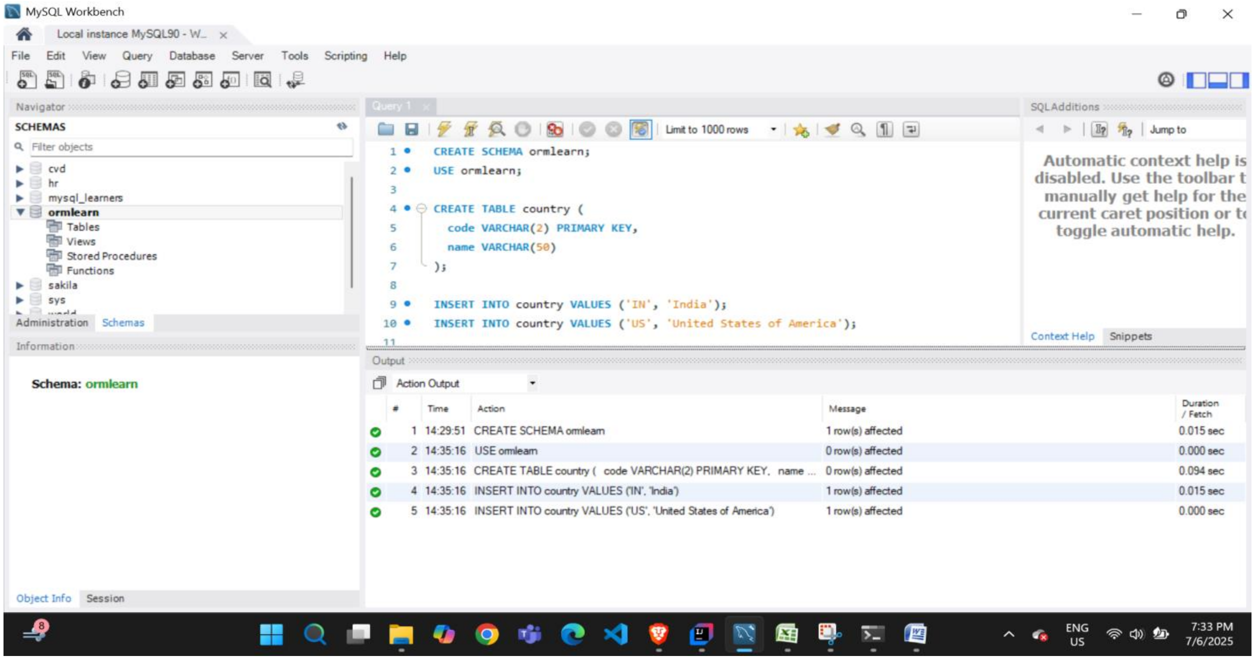
Spring Data JPA - Quick Example

MySQL Database

```
CREATE SCHEMA ormlearn;

USE ormlearn;

CREATE TABLE country (

   code VARCHAR(2) PRIMARY KEY,

   name VARCHAR(50)

);

INSERT INTO country VALUES ('IN', 'India');

INSERT INTO country VALUES ('US', 'United States of America');
```

Output:



```
CREATE SCHEMA ormlearn;
USE ormlearn;

CREATE TABLE country (
  code VARCHAR(2) PRIMARY KEY,
  name VARCHAR(50)
);

INSERT INTO country VALUES ('IN', 'India');
INSERT INTO country VALUES ('US', 'United States of America');
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

Schema: ormlearn

```
 #  Time      Action                                                       Message             Duration / Fetch
 1  14:29:51  CREATE SCHEMA ormlearn                                       1 row(s) affected   0.015 sec
 2  14:35:16  USE ormlearn                                                 0 row(s) affected   0.000 sec
 3  14:35:16  CREATE TABLE country (   code VARCHAR(2) PRIMARY KEY,   name ...  0 row(s) affected   0.094 sec
 4  14:35:16  INSERT INTO country VALUES ('IN', 'India')                   1 row(s) affected   0.015 sec
 5  14:35:16  INSERT INTO country VALUES ('US', 'United States of America')  1 row(s) affected   0.000 sec
```

Configure application.properties:

```
# Logging

logging.level.org.springframework=info

logging.level.com.cognizant=debug

logging.level.org.hibernate.SQL=trace

logging.level.org.hibernate.type.descriptor.sql=trace


logging.pattern.console=%d{dd-MM-yy} %d{HH:mm:ss.SSS} %-20.20thread %5p %-25.25logger{25} %25M %4L %m%n


spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver

spring.datasource.url=jdbc:mysql://localhost:3306/ormlearn

spring.datasource.username=root

spring.datasource.password=root

spring.jpa.hibernate.ddl-auto=validate

spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL5Dialect
```

Create Entity Class Country.java:

```
package com.cognizant.ormlearn.model;


import jakarta.persistence.Column;

import jakarta.persistence.Entity;

import jakarta.persistence.Id;
import jakarta.persistence.Table;

@Entity
@Table(name = "country")
public class Country {

    @Id
    @Column(name = "code")
    private String code;
    @Column(name = "name")
    private String name;
    public String getCode() {
        return code;
    }
    public void setCode(String code) {
        this.code = code;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    @Override
    public String toString() {
        return "Country [code=" + code + ", name=" + name + "]";
    }
}
```

Create Repository Interface:

```
package com.cognizant.ormlearn.repository;


import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;
import com.cognizant.ormlearn.model.Country;


@Repository
public interface CountryRepository extends JpaRepository<Country, String> {
}
```

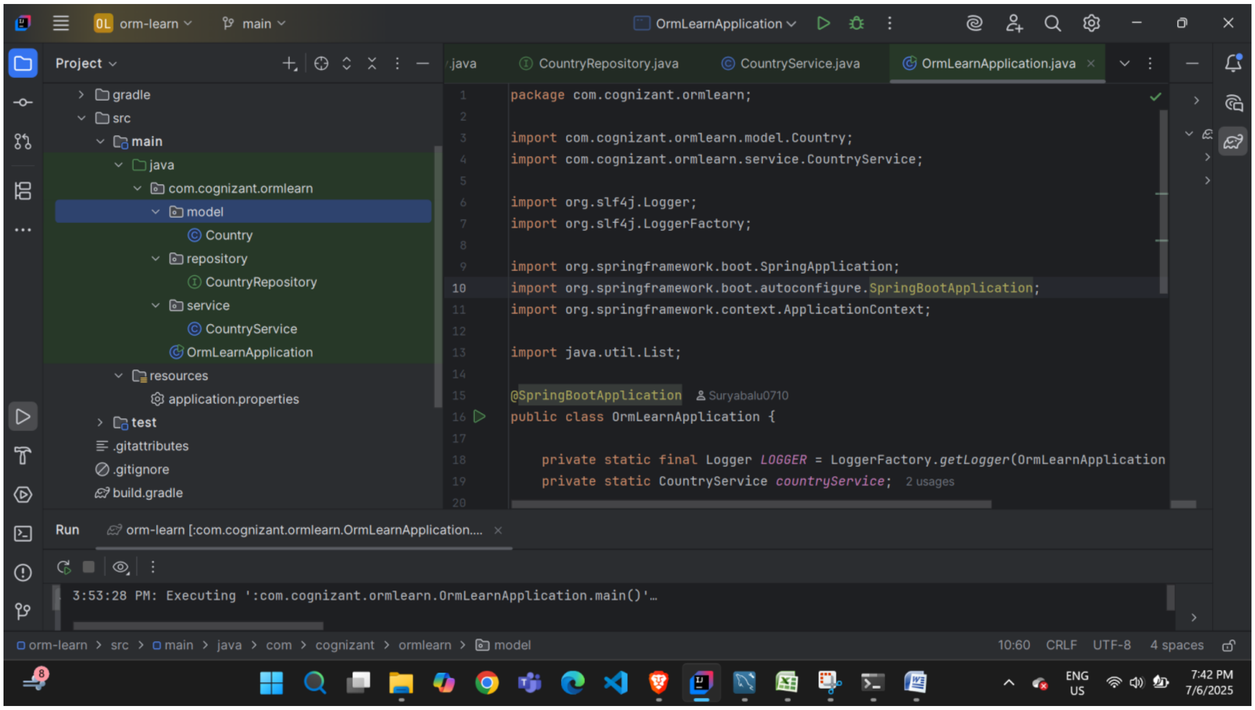
Create Service Class:

```
package com.cognizant.ormlearn.service;
import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import org.springframework.transaction.annotation.Transactional;
import com.cognizant.ormlearn.model.Country;
import com.cognizant.ormlearn.repository.CountryRepository;

@Service
public class CountryService {

    @Autowired
    private CountryRepository countryRepository;

    @Transactional
    public List<Country> getAllCountries() {
        return countryRepository.findAll();
    }
}
```

Modify Main Class:

```
package com.cognizant.ormlearn;

import com.cognizant.ormlearn.model.Country;
import com.cognizant.ormlearn.service.CountryService;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.ApplicationContext;

import java.util.List;

@SpringBootApplication
public class OrmLearnApplication {

    private static final Logger LOGGER = LoggerFactory.getLogger(OrmLearnApplication.class);
    private static CountryService countryService;

    public static void main(String[] args) {
        ApplicationContext context = SpringApplication.run(OrmLearnApplication.class, args);
        LOGGER.info("Inside main");

        countryService = context.getBean(CountryService.class);
        testGetAllCountries();
    }

    private static void testGetAllCountries() {
        LOGGER.info("Start");
        List<Country> countries = countryService.getAllCountries();
        LOGGER.debug("countries={}", countries);
        LOGGER.info("End");
    }
}
```

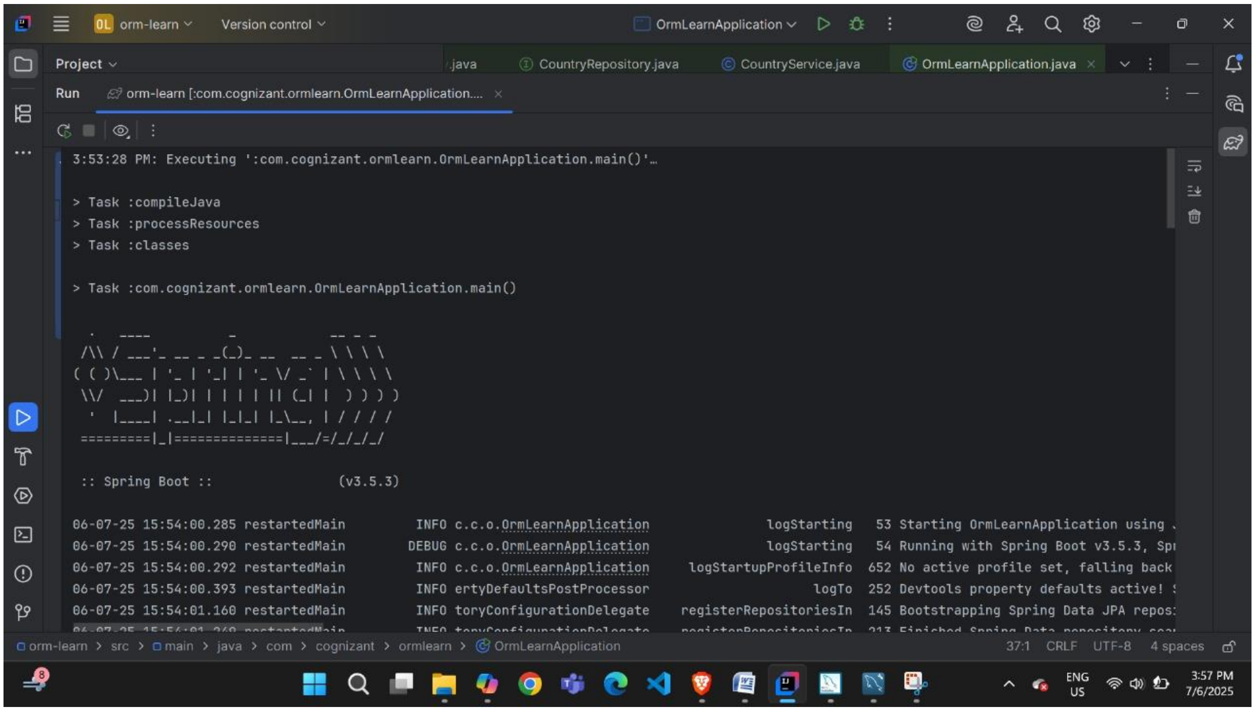
Execution:



```java
package com.cognizant.ormlearn;

import com.cognizant.ormlearn.model.Country;
import com.cognizant.ormlearn.service.CountryService;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.ApplicationContext;

import java.util.List;

@SpringBootApplication
public class OrmLearnApplication {

    private static final Logger LOGGER = LoggerFactory.getLogger(OrmLearnApplication
    private static CountryService countryService;
```

```
3:53:28 PM: Executing ':com.cognizant.ormlearn.OrmLearnApplication.main()'…
```

Output:



```
3:53:28 PM: Executing ':com.cognizant.ormlearn.OrmLearnApplication.main()'…

> Task :compileJava
> Task :processResources
> Task :classes

> Task :com.cognizant.ormlearn.OrmLearnApplication.main()

  .   ____          _            __ _ _
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( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/

 :: Spring Boot ::                (v3.5.3)

06-07-25 15:54:00.285 restartedMain        INFO c.c.o.OrmLearnApplication                logStarting   53 Starting OrmLearnApplication using .
06-07-25 15:54:00.290 restartedMain       DEBUG c.c.o.OrmLearnApplication                logStarting   54 Running with Spring Boot v3.5.3, Spı
06-07-25 15:54:00.292 restartedMain        INFO c.c.o.OrmLearnApplication         logStartupProfileInfo  652 No active profile set, falling back
06-07-25 15:54:00.393 restartedMain        INFO ertyDefaultsPostProcessor                      logTo  252 Devtools property defaults active! !
06-07-25 15:54:01.160 restartedMain        INFO toryConfigurationDelegate     registerRepositoriesIn  145 Bootstrapping Spring Data JPA repos:
```
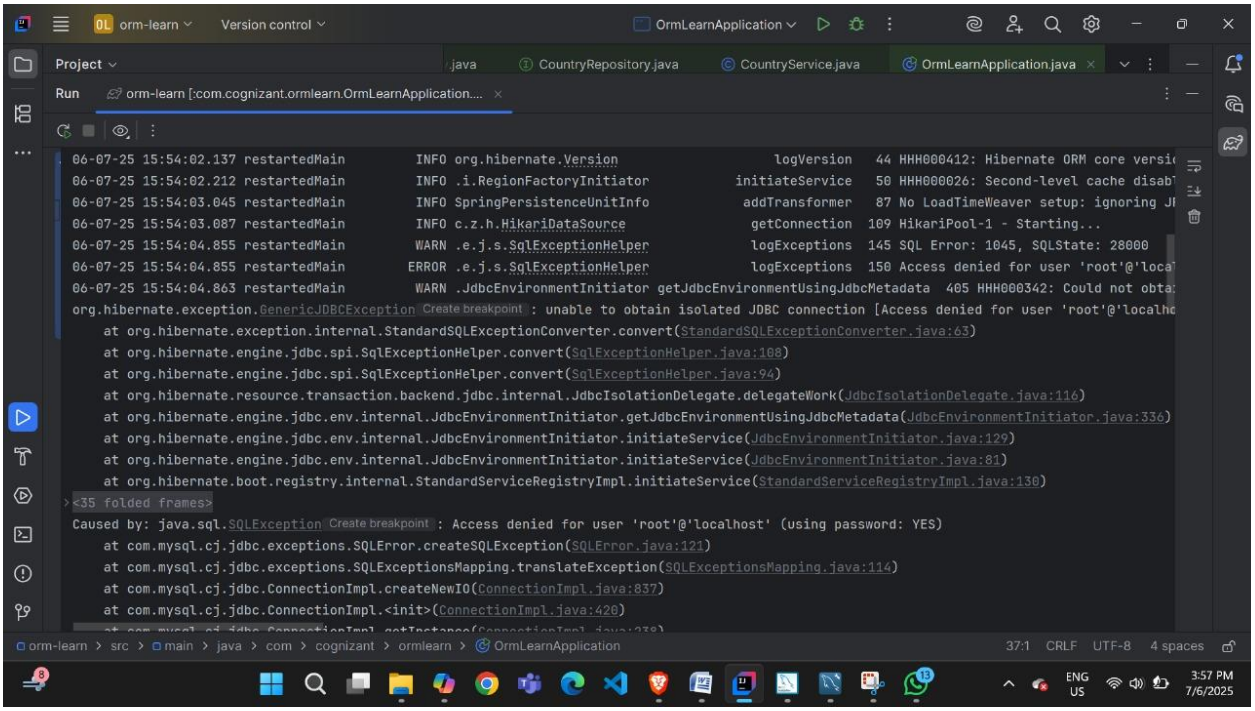
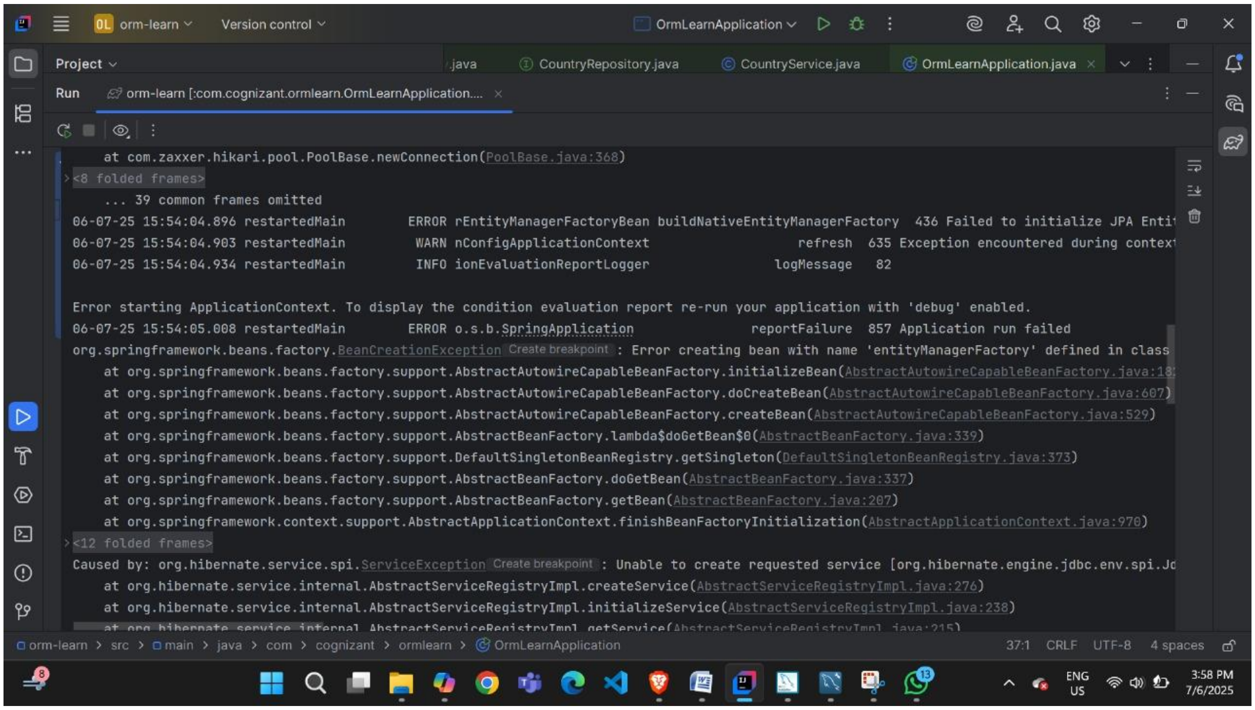
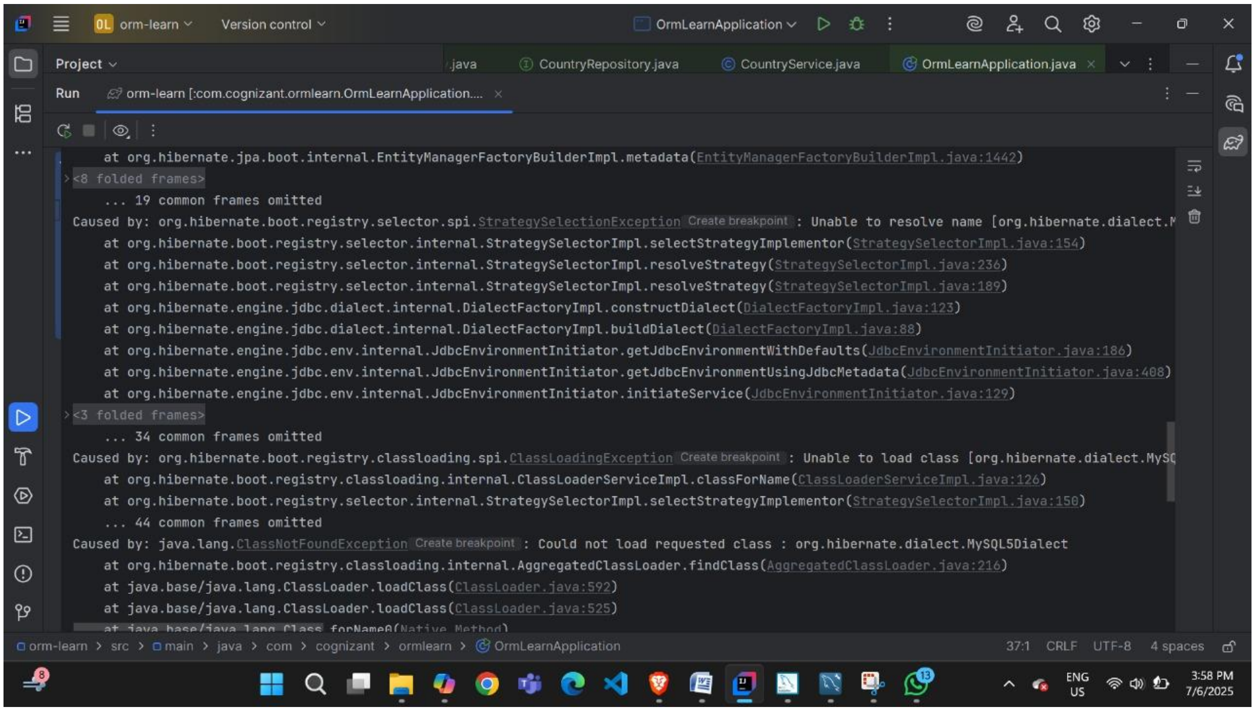



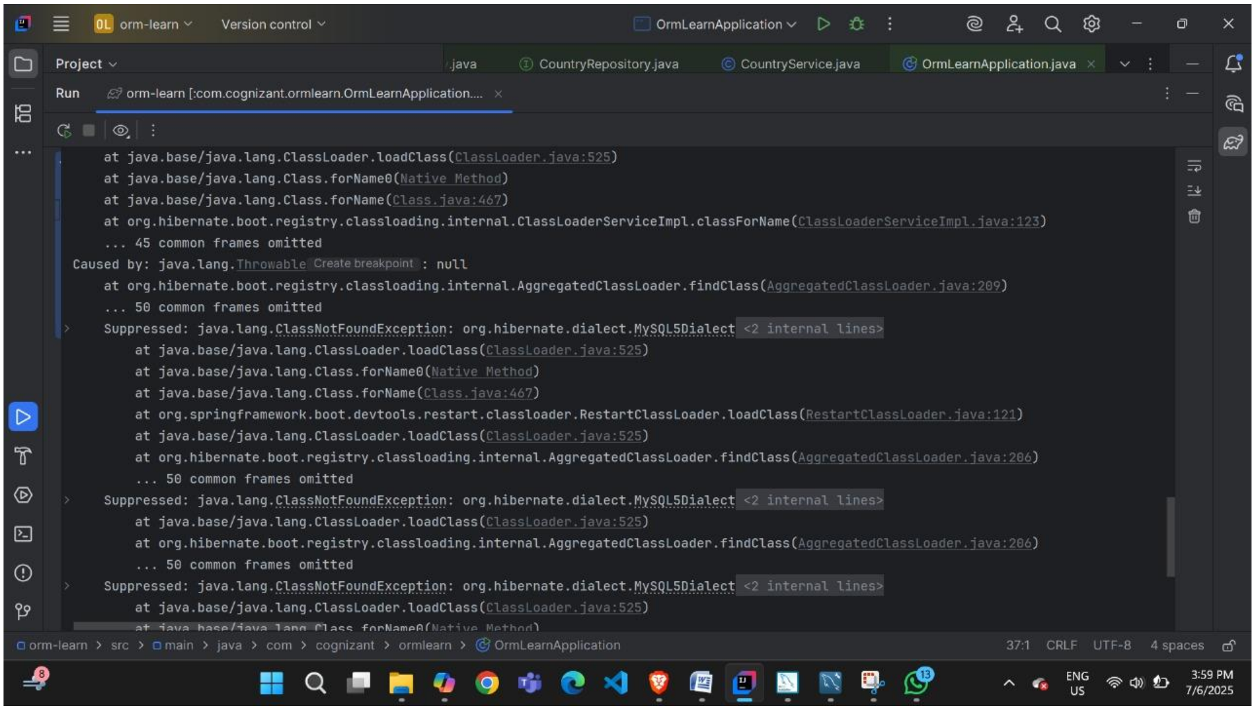
```
06-07-25 15:54:02.137 restartedMain        INFO org.hibernate.Version                     logVersion   44 HHH000412: Hibernate ORM core versi
06-07-25 15:54:02.212 restartedMain        INFO .i.RegionFactoryInitiator            initiateService   50 HHH000026: Second-level cache disab
06-07-25 15:54:03.045 restartedMain        INFO SpringPersistenceUnitInfo             addTransformer   87 No LoadTimeWeaver setup: ignoring JI
06-07-25 15:54:03.087 restartedMain        INFO c.z.h.HikariDataSource                 getConnection  109 HikariPool-1 - Starting...
06-07-25 15:54:04.855 restartedMain        WARN .e.j.s.SqlExceptionHelper              logExceptions  145 SQL Error: 1045, SQLState: 28000
06-07-25 15:54:04.855 restartedMain       ERROR .e.j.s.SqlExceptionHelper              logExceptions  150 Access denied for user 'root'@'loca
06-07-25 15:54:04.863 restartedMain        WARN .JdbcEnvironmentInitiator getJdbcEnvironmentUsingJdbcMetadata  405 HHH000342: Could not obta
org.hibernate.exception.GenericJDBCException : unable to obtain isolated JDBC connection [Access denied for user 'root'@'localho
    at org.hibernate.exception.internal.StandardSQLExceptionConverter.convert(StandardSQLExceptionConverter.java:63)
    at org.hibernate.engine.jdbc.spi.SqlExceptionHelper.convert(SqlExceptionHelper.java:108)
    at org.hibernate.engine.jdbc.spi.SqlExceptionHelper.convert(SqlExceptionHelper.java:94)
    at org.hibernate.resource.transaction.backend.jdbc.internal.JdbcIsolationDelegate.delegateWork(JdbcIsolationDelegate.java:116)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.getJdbcEnvironmentUsingJdbcMetadata(JdbcEnvironmentInitiator.java:336)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.initiateService(JdbcEnvironmentInitiator.java:129)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.initiateService(JdbcEnvironmentInitiator.java:81)
    at org.hibernate.boot.registry.internal.StandardServiceRegistryImpl.initiateService(StandardServiceRegistryImpl.java:130)
<35 folded frames>
Caused by: java.sql.SQLException : Access denied for user 'root'@'localhost' (using password: YES)
    at com.mysql.cj.jdbc.exceptions.SQLError.createSQLException(SQLError.java:121)
    at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:114)
    at com.mysql.cj.jdbc.ConnectionImpl.createNewIO(ConnectionImpl.java:837)
    at com.mysql.cj.jdbc.ConnectionImpl.<init>(ConnectionImpl.java:420)
```



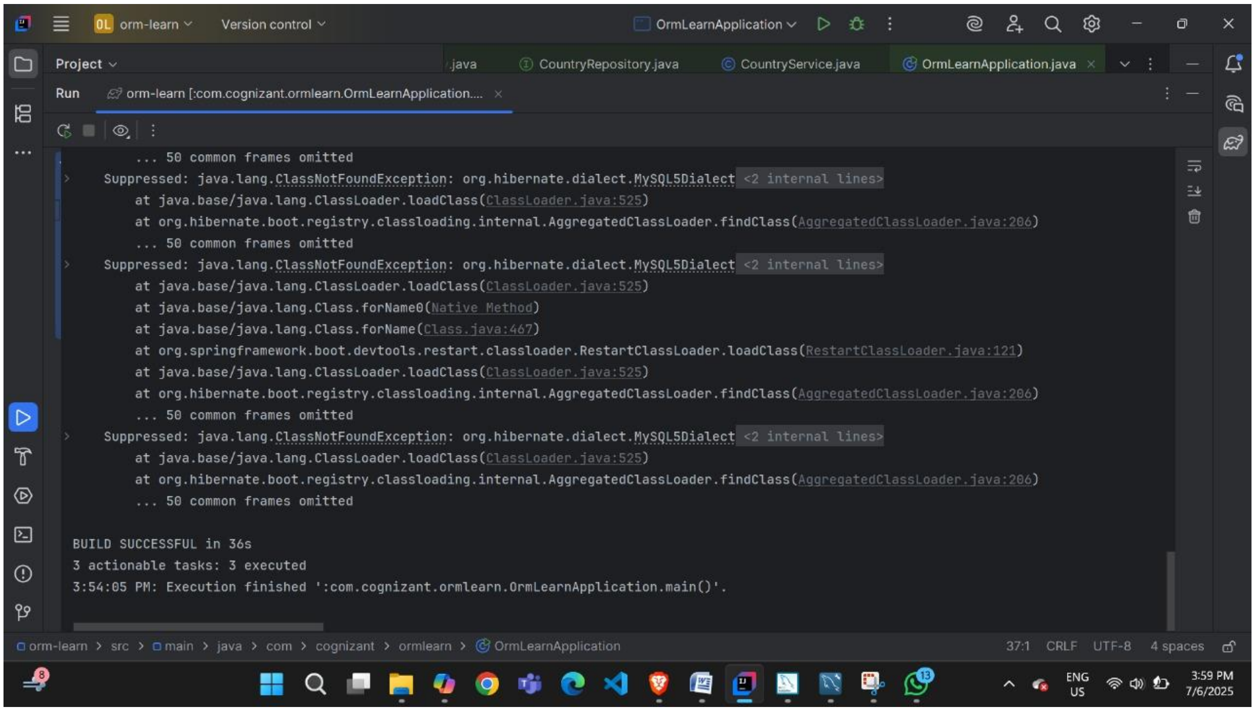
```
    at com.zaxxer.hikari.pool.PoolBase.newConnection(PoolBase.java:368)
<8 folded frames>
    ... 39 common frames omitted
06-07-25 15:54:04.896 restartedMain        ERROR rEntityManagerFactoryBean buildNativeEntityManagerFactory  436 Failed to initialize JPA Entit
06-07-25 15:54:04.903 restartedMain         WARN nConfigApplicationContext                   refresh  635 Exception encountered during context
06-07-25 15:54:04.934 restartedMain         INFO ionEvaluationReportLogger                logMessage   82

Error starting ApplicationContext. To display the condition evaluation report re-run your application with 'debug' enabled.
06-07-25 15:54:05.008 restartedMain        ERROR o.s.b.SpringApplication               reportFailure  857 Application run failed
org.springframework.beans.factory.BeanCreationException Create breakpoint : Error creating bean with name 'entityManagerFactory' defined in class
    at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.initializeBean(AbstractAutowireCapableBeanFactory.java:18
    at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:607)
    at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFactory.java:529)
    at org.springframework.beans.factory.support.AbstractBeanFactory.lambda$doGetBean$0(AbstractBeanFactory.java:339)
    at org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:373)
    at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:337)
    at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:207)
    at org.springframework.context.support.AbstractApplicationContext.finishBeanFactoryInitialization(AbstractApplicationContext.java:970)
<12 folded frames>
Caused by: org.hibernate.service.spi.ServiceException Create breakpoint : Unable to create requested service [org.hibernate.engine.jdbc.env.spi.Jd
    at org.hibernate.service.internal.AbstractServiceRegistryImpl.createService(AbstractServiceRegistryImpl.java:276)
    at org.hibernate.service.internal.AbstractServiceRegistryImpl.initializeService(AbstractServiceRegistryImpl.java:238)
    at org.hibernate.service.internal.AbstractServiceRegistryImpl.getService(AbstractServiceRegistryImpl.java:215)
```



```
    at org.hibernate.jpa.boot.internal.EntityManagerFactoryBuilderImpl.metadata(EntityManagerFactoryBuilderImpl.java:1442)
<8 folded frames>
    ... 19 common frames omitted
Caused by: org.hibernate.boot.registry.selector.spi.StrategySelectionException Create breakpoint : Unable to resolve name [org.hibernate.dialect.M
    at org.hibernate.boot.registry.selector.internal.StrategySelectorImpl.selectStrategyImplementor(StrategySelectorImpl.java:154)
    at org.hibernate.boot.registry.selector.internal.StrategySelectorImpl.resolveStrategy(StrategySelectorImpl.java:236)
    at org.hibernate.boot.registry.selector.internal.StrategySelectorImpl.resolveStrategy(StrategySelectorImpl.java:189)
    at org.hibernate.engine.jdbc.dialect.internal.DialectFactoryImpl.constructDialect(DialectFactoryImpl.java:123)
    at org.hibernate.engine.jdbc.dialect.internal.DialectFactoryImpl.buildDialect(DialectFactoryImpl.java:88)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.getJdbcEnvironmentWithDefaults(JdbcEnvironmentInitiator.java:186)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.getJdbcEnvironmentUsingJdbcMetadata(JdbcEnvironmentInitiator.java:408)
    at org.hibernate.engine.jdbc.env.internal.JdbcEnvironmentInitiator.initiateService(JdbcEnvironmentInitiator.java:129)
<3 folded frames>
    ... 34 common frames omitted
Caused by: org.hibernate.boot.registry.classloading.spi.ClassLoadingException Create breakpoint : Unable to load class [org.hibernate.dialect.MySQ
    at org.hibernate.boot.registry.classloading.internal.ClassLoaderServiceImpl.classForName(ClassLoaderServiceImpl.java:126)
    at org.hibernate.boot.registry.selector.internal.StrategySelectorImpl.selectStrategyImplementor(StrategySelectorImpl.java:150)
    ... 44 common frames omitted
Caused by: java.lang.ClassNotFoundException Create breakpoint : Could not load requested class : org.hibernate.dialect.MySQL5Dialect
    at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:216)
    at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:592)
    at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
    at java.base/java.lang.Class.forName0(Native Method)
```



```
    at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
    at java.base/java.lang.Class.forName0(Native Method)
    at java.base/java.lang.Class.forName(Class.java:467)
    at org.hibernate.boot.registry.classloading.internal.ClassLoaderServiceImpl.classForName(ClassLoaderServiceImpl.java:123)
    ... 45 common frames omitted
Caused by: java.lang.Throwable Create breakpoint : null
    at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:209)
    ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at java.base/java.lang.Class.forName0(Native Method)
        at java.base/java.lang.Class.forName(Class.java:467)
        at org.springframework.boot.devtools.restart.classloader.RestartClassLoader.loadClass(RestartClassLoader.java:121)
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:206)
        ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:206)
        ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at java.base/java.lang.Class.forName0(Native Method)
```



```
        ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:206)
        ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at java.base/java.lang.Class.forName0(Native Method)
        at java.base/java.lang.Class.forName(Class.java:467)
        at org.springframework.boot.devtools.restart.classloader.RestartClassLoader.loadClass(RestartClassLoader.java:121)
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:206)
        ... 50 common frames omitted
    Suppressed: java.lang.ClassNotFoundException: org.hibernate.dialect.MySQL5Dialect <2 internal lines>
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:525)
        at org.hibernate.boot.registry.classloading.internal.AggregatedClassLoader.findClass(AggregatedClassLoader.java:206)
        ... 50 common frames omitted

BUILD SUCCESSFUL in 36s
3 actionable tasks: 3 executed
3:54:05 PM: Execution finished ':com.cognizant.ormlearn.OrmLearnApplication.main()'.
```