

Spring Data JPA - Quick Example

Code :

application.properties :

```
spring.application.name=orm-learn
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=Aathira@14
spring.jpa.hibernate.ddl-auto=update
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect
```

Country.java :

```
package com.cognizant.orm_learn.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 + "'}";

}

}

CountryRepository.java :

```
package com.cognizant.orm_learn.repository;

import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

import com.cognizant.orm_learn.model.Country;

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

CountryService.java :

```
package com.cognizant.orm_learn.service;

import java.util.List;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import com.cognizant.orm_learn.model.Country;
import com.cognizant.orm_learn.repository.CountryRepository;

import jakarta.transaction.Transactional;

@Service
public class CountryService {

    @Autowired
    private CountryRepository countryRepository;
```

```

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

```

OrmLearnApplication.java :

```

package com.cognizant.orm_learn;

```

```

import java.util.List;

```

```

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 com.cognizant.orm_learn.model.Country;

```

```

import com.cognizant.orm_learn.service.CountryService;

```

```

@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);

```

```

countryService = context.getBean(CountryService.class);

LOGGER.info("Inside main");

testGetAllCountries();

}

private static void testGetAllCountries() {
    LOGGER.info("Start");

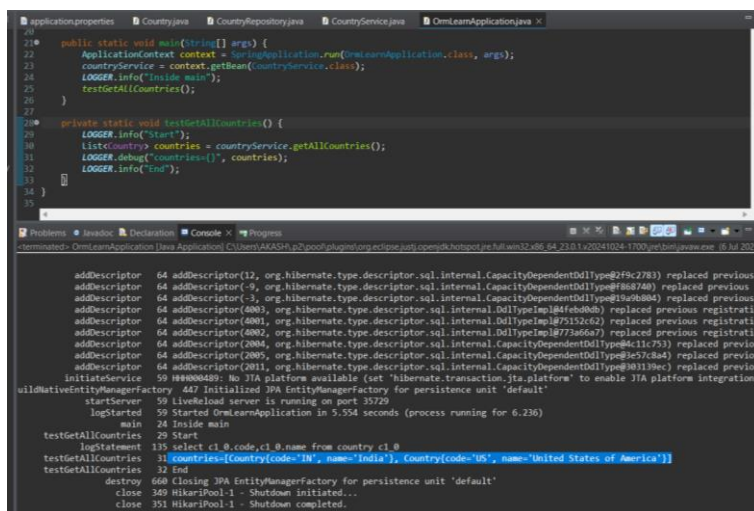
    List<Country> countries = countryService.getAllCountries();

    LOGGER.debug("countries={}", countries);

    LOGGER.info("End");
}
}

```

Output :

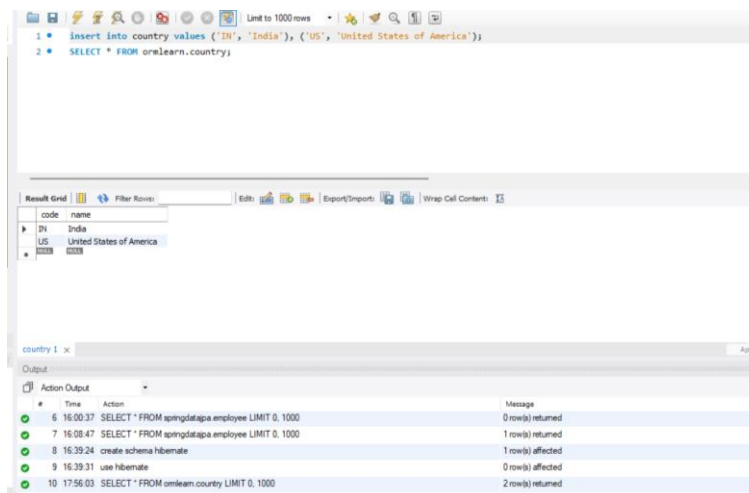


The screenshot shows an IDE with a Java file named `OmLearnApplication.java`. The code defines a `main` method and a `testGetAllCountries` method. The `main` method calls `testGetAllCountries`. The `testGetAllCountries` method logs "Start", calls `countryService.getAllCountries()`, logs the result, and logs "End". The console output shows the execution of the application, including the initialization of the Spring context, the logging of "Start", the execution of the `testGetAllCountries` method, and the logging of "End". The output also shows the initialization of the database and the execution of the `testGetAllCountries` method.

```

addDescriptor(64 addDescriptor(12, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@2f8c2783) replaced previous
addDescriptor(64 addDescriptor(9, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@868740) replaced previous
addDescriptor(64 addDescriptor(3, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@19a98804) replaced previous
addDescriptor(64 addDescriptor(4003, org.hibernate.type.descriptor.sql.internal.DdlTypeImpl@d4feb0db) replaced previous registrati
addDescriptor(64 addDescriptor(4001, org.hibernate.type.descriptor.sql.internal.DdlTypeImpl@d512c42) replaced previous registrati
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addDescriptor(64 addDescriptor(2008, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@411c753) replaced previous
addDescriptor(64 addDescriptor(2009, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@57c8a4) replaced previous
addDescriptor(64 addDescriptor(2011, org.hibernate.type.descriptor.sql.internal.CapacityDependentDdlType@803119ac) replaced previous
initiateService 59 HH000049: No JTA platform available (set 'hibernate.transaction.jta.platform' to enable JTA platform integration)
wildNativeEntityManagerFactory 447 Initialized JPA EntityManagerFactory for persistence unit 'default'
startServer 59 liveReload server is running on port 30220
logStarted 59 Started OmLearnApplication in 5.554 seconds (process running for 6.236)
main 24 Inside main
testGetAllCountries 29 Start
logStatement 135 select c1.0,code,c1.0.name from country c1.0
testGetAllCountries 31 countries=[Country(code='IN', name='India'), Country(code='US', name='United States of America')]
testGetAllCountries 32 End
destroy 660 Closing JPA EntityManagerFactory for persistence unit 'default'
close 349 HikariPool-1 - Shutdown initiated...
close 351 HikariPool-1 - Shutdown completed.

```



The screenshot shows a database client with two SQL queries and their results. The first query is an insert statement that inserts two rows into the `country` table. The second query is a select statement that retrieves all rows from the `country` table. The results show two rows: one for India and one for the United States of America.

```

1 • insert into country values ('IN', 'India'), ('US', 'United States of America');
2 • SELECT * FROM omlearn.country;

```

code	name
IN	India
US	United States of America

country 1 x

Output

#	Time	Action	Message
6	16:00:37	SELECT * FROM springdata.employee LIMIT 0, 1000	0 row(s) returned
7	16:00:47	SELECT * FROM springdata.employee LIMIT 0, 1000	1 row(s) returned
8	16:39:24	create schema hibernate	1 row(s) affected
9	16:39:31	use hibernate	0 row(s) affected
10	17:56:03	SELECT * FROM omlearn.country LIMIT 0, 1000	2 row(s) returned

Difference between JPA, Hibernate and Spring Data JPA

For Hibernate :

Code :

application.properties :

```
spring.application.name=hibernate
spring.datasource.url=jdbc:mysql://localhost:3306/hibernate
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
spring.datasource.username=root
spring.datasource.password=Aathira@14
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect
spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
debug=true
```

AssetVendor.java :

```
package com.hibernate.hibernate.entity;

import jakarta.persistence.Column;
import jakarta.persistence.Entity;
import jakarta.persistence.GeneratedValue;
import jakarta.persistence.GenerationType;
import jakarta.persistence.Id;
import jakarta.persistence.Table;
import jakarta.validation.constraints.Size;

@Entity
```

```
@Table(name = "assetvendor")
public class AssetVendor {

    @Id
    @GeneratedValue(strategy = GenerationType.UUID)
    @Column(name = "vendor_Id", nullable = false, updatable = false)
    private java.util.UUID id;

    @Column(name = "vendor_Name")
    private String vendorName;

    @Column(name = "vendor_Number")
    @Size(min = 10, max = 10)
    private String vendorNumber;

    @Column(name = "vendor_Brand")
    private String vendorBrand;

    @Column(name = "vendor_Address")
    private String vendorAddress;

    public AssetVendor() {
    }

    public java.util.UUID getId() {
        return id;
    }

    public void setId(java.util.UUID id) {
        this.id = id;
    }
}
```

```
}
```

```
public String getVendorName() {  
    return vendorName;  
}
```

```
public void setVendorName(String vendorName) {  
    this.vendorName = vendorName;  
}
```

```
public String getVendorNumber() {  
    return vendorNumber;  
}
```

```
public void setVendorNumber(String vendorNumber) {  
    this.vendorNumber = vendorNumber;  
}
```

```
public String getVendorBrand() {  
    return vendorBrand;  
}
```

```
public void setVendorBrand(String vendorBrand) {  
    this.vendorBrand = vendorBrand;  
}
```

```
public String getVendorAddress() {  
    return vendorAddress;  
}
```



```

        public void setVendorAddress(String vendorAddress) {
            this.vendorAddress = vendorAddress;
        }
    }
}

```

AssetVendorConfig.java :

```

package com.hibernate.hibernate.config;

```

```

import java.util.Properties;

```

```

import javax.sql.DataSource;

```

```

import org.hibernate.SessionFactory;

```

```

import org.springframework.beans.factory.annotation.Autowired;

```

```

import org.springframework.context.annotation.*;

```

```

import org.springframework.core.env.Environment;

```

```

import org.springframework.jdbc.datasource.DriverManagerDataSource;

```

```

import org.springframework.orm.hibernate5.HibernateTransactionManager;

```

```

import org.springframework.orm.hibernate5.LocalSessionFactoryBean;

```

```

import org.springframework.transaction.annotation.EnableTransactionManagement;

```

```

@Configuration

```

```

@EnableTransactionManagement

```

```

@PropertySource("classpath:application.properties")

```

```

public class AssetVendorConfig {

```

```

    @Autowired

```

```

    private Environment env;

```

```

    @Bean

```

```

    public DataSource dataSource() {

```

```

    DriverManagerDataSource ds = new DriverManagerDataSource();
    ds.setDriverClassName(env.getRequiredProperty("spring.datasource.driver-class-name"));
    ds.setUrl(env.getRequiredProperty("spring.datasource.url"));
    ds.setUsername(env.getRequiredProperty("spring.datasource.username"));
    ds.setPassword(env.getRequiredProperty("spring.datasource.password"));
    return ds;
}

```

@Bean

```

public LocalSessionFactoryBean sessionFactory() {
    LocalSessionFactoryBean factoryBean = new LocalSessionFactoryBean();
    factoryBean.setDataSource(dataSource());
    factoryBean.setPackagesToScan("com.hibernate.hibernate.entity");
    factoryBean.setHibernateProperties(hibernateProperties());
    return factoryBean;
}

```

```

private Properties hibernateProperties() {
    Properties props = new Properties();
    props.put("hibernate.dialect", "org.hibernate.dialect.PostgreSQLDialect");
    props.put("hibernate.hbm2ddl.auto", "update");
    props.put("hibernate.show_sql", "true");
    return props;
}

```

@Bean

```

public HibernateTransactionManager transactionManager(SessionFactory sessionFactory)
{
    HibernateTransactionManager txManager = new HibernateTransactionManager();
    txManager.setSessionFactory(sessionFactory);
}

```

```
        return txManager;
    }
}
```

AssetVendorDAOImpl :

```
package com.hibernate.hibernate.dao.daoimpl;

import java.util.List;
import java.util.UUID;

import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Repository;

import com.hibernate.hibernate.dao.AssetVendorDAO;
import com.hibernate.hibernate.entity.AssetVendor;

import jakarta.persistence.criteria.CriteriaBuilder;
import jakarta.persistence.criteria.CriteriaQuery;
import jakarta.persistence.criteria.Root;
import jakarta.transaction.Transactional;

@Repository
@Transactional
public class AssetVendorDAOImpl implements AssetVendorDAO {

    private static final Logger logger =
        LoggerFactory.getLogger(AssetVendorDAO.class);
```

@Autowired

```
private SessionFactory sessionFactory;
```

```
public Session getSession() {  
    return sessionFactory.getCurrentSession();  
}
```

@Override

```
public AssetVendor saveVendor(AssetVendor assetVendor) {  
    getSession().persist(assetVendor);  
    return assetVendor;  
}
```

@Override

```
public List<AssetVendor> getAllVendor(AssetVendor assetVendor) {  
    Session session = getSession();  
    CriteriaBuilder cb = session.getCriteriaBuilder();  
    CriteriaQuery<AssetVendor> cq = cb.createQuery(AssetVendor.class);  
    Root<AssetVendor> root = cq.from(AssetVendor.class);  
  
    cq.orderBy(cb.asc(root.get("vendorName")));  
  
    return session.createQuery(cq).getResultList();  
}
```

@Override

```
public void deleteAssetVendor(AssetVendor assetVendor, UUID vendorId) {  
    Session session = getSession();  
    AssetVendor vendor = session.get(AssetVendor.class, vendorId);
```

```
        if (vendor != null) {  
            getSession().remove(vendor);  
        }  
    }  
}
```

@Override

```
public AssetVendor updateVendor(AssetVendor assetVendor, UUID vendorId) {  
    Session session = getSession();  
    AssetVendor updateVendor = session.get(AssetVendor.class, vendorId);  
  
    if (updateVendor != null) {  
  
        if (assetVendor.getVendorName() != null) {  
  
updateVendor.setVendorName(assetVendor.getVendorName());  
        }  
  
        if (assetVendor.getVendorNumber() != null) {  
  
updateVendor.setVendorNumber(assetVendor.getVendorNumber());  
        }  
  
        if (assetVendor.getVendorBrand() != null) {  
  
updateVendor.setVendorBrand(assetVendor.getVendorBrand());  
        }  
  
        if (assetVendor.getVendorAddress() != null) {  
  
updateVendor.setVendorAddress(assetVendor.getVendorAddress());  
        }  
    }  
}
```

```

        session.merge(updateVendor);
        logger.info("Vendor Updated Successfully");
    } else {
        logger.warn("Vendor is not found");
    }
    return updateVendor;
}
}

```

AssetVendorController :

```

package com.hibernate.hibernate.controller;

import java.util.List;
import java.util.UUID;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.DeleteMapping;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.PutMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

import com.hibernate.hibernate.dao.AssetVendorDAO;
import com.hibernate.hibernate.entity.AssetVendor;
import com.hibernate.hibernate.service.AssetVendorService;

```

```

@RestController
@RequestMapping("/assetvendor")
public class AssetVendorController {

    private static final Logger logger =
LoggerFactory.getLogger(AssetVendorController.class);

    @Autowired
    private AssetVendorService assetVendorService;

    @Autowired
    private AssetVendorDAO assetVendorDAO;

    // @PostMapping("/savevendor")
    // public String saveVendor(@Valid AssetVendor vendor) {
    //     assetVendorService.saveVendor(vendor);
    //     return "Vendor Saved Successfully";
    // }

    @PostMapping("/persistvendor")
    public String saveVendor(@RequestBody AssetVendor assetVendor) {
        AssetVendor assetVendorObj = null;
        AssetVendor saveVendor = convertToEntity(assetVendor);
        try {
            logger.debug("Created Vendor Details");
            assetVendorObj = assetVendorDAO.saveVendor(assetVendor);
            logger.debug("Created Vendor Successfully");
        } catch (Exception e) {
            logger.debug("Error while creating Vendor : " + e.getMessage());
        }
        return "Vendor Successfully Created";
    }
}

```

```
}
```

```
private AssetVendor convertToEntity(AssetVendor assetVendor) {  
    AssetVendor entity = new AssetVendor();  
    entity.setVendorName(assetVendor.getVendorName());  
    entity.setVendorBrand(assetVendor.getVendorBrand());  
    entity.setVendorNumber(assetVendor.getVendorNumber());  
    entity.setVendorAddress(assetVendor.getVendorAddress());  
    return entity;  
}
```

```
@GetMapping("/getallvendor")
```

```
public List<AssetVendor> getAllVendor(AssetVendor assetVendor) {  
    List<AssetVendor> assetVendorList = null;  
    try {  
        logger.debug("Successfully got the Vendors");  
        assetVendorList = assetVendorDAO.getAllVendor(assetVendor);  
    } catch (Exception e) {  
        logger.debug("Error while getting All Vendor : " + e.getMessage());  
    }  
    return assetVendorList;  
}
```

```
@DeleteMapping("/deletevendor/{vendorId}")
```

```
public String deleteVendor(AssetVendor assetVendor, @PathVariable UUID  
vendorId) {  
    try {  
        assetVendorDAO.deleteAssetVendor(assetVendor, vendorId);  
        return "Vendor Deleted Successfully";  
    } catch (Exception e) {  
        logger.debug("Cannot find the Vendor : " + e.getMessage());  
    }  
}
```



```

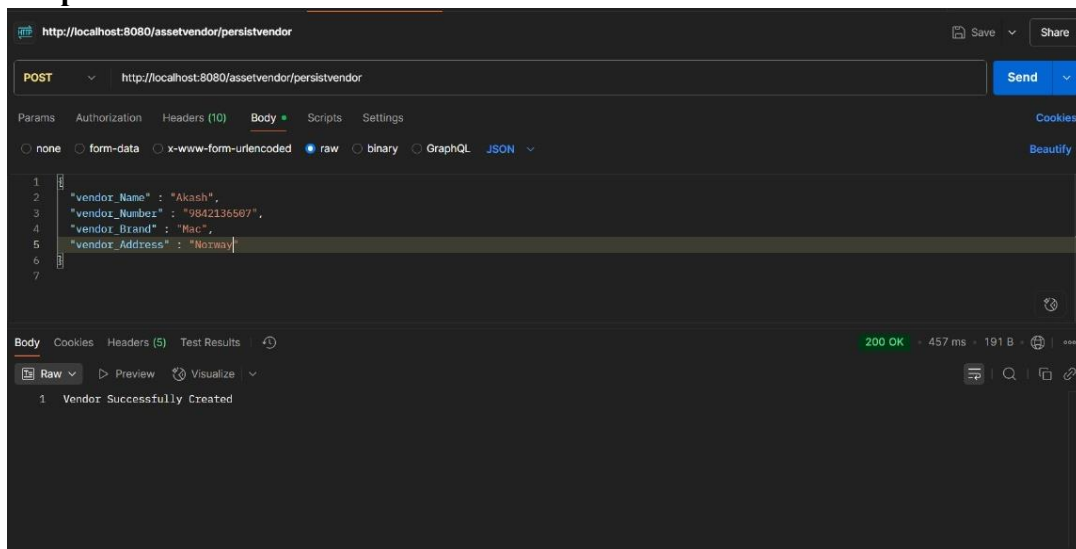
        return "Cannot Delete the Vendor";
    }
}

@PostMapping("/updatevendor/{vendorId}")
public AssetVendor updateVendor(@RequestBody AssetVendor assetVendor,
                                @PathVariable UUID vendorId) {
    try {
        AssetVendor updatedVendor =
assetVendorDAO.updateVendor(assetVendor, vendorId);

        return updatedVendor;
    } catch (Exception e) {
        logger.debug("Cannot Update the Vendor");
        return assetVendor;
    }
}
}
}

```

Output :



```

1 • SELECT * FROM hibernate.assetvendor;
2 • insert into assetvendor(vendor_id, vendor_name, vendor_number, vendor_brand, vendor_address)
3   values('3','akash','9842136507','Mac','Norway');

```

vendor_id	vendor_address	vendor_brand	vendor_name	vendor_number
1	Australia	Mac	Salha	9842136507
2	Norway	Mac	Akath	9842136507

#	Time	Action	Message
23	17:10:30	insert into assetvendor(vendor_id, vendor_name, vendor_number, vendor_brand, vendor_address) values(...)	1 row(s) affected
24	17:10:35	SELECT * FROM hibernate.assetvendor LIMIT 0, 1000	2 row(s) returned
25	17:12:53	insert into assetvendor(vendor_id, vendor_name, vendor_number, vendor_brand, vendor_address) values(...)	Error Code: 1062 Duplicate entry '2' for key 'assetvendor.PRIMARY'
26	17:12:57	SELECT * FROM hibernate.assetvendor LIMIT 0, 1000	2 row(s) returned
27	17:13:06	insert into assetvendor(vendor_id, vendor_name, vendor_number, vendor_brand, vendor_address) values(...)	1 row(s) affected
28	17:13:09	SELECT * FROM hibernate.assetvendor LIMIT 0, 1000	3 row(s) returned

For Spring Data JPA :

Code :

application.properties :

spring.application.name=SpringDataJPA

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

spring.datasource.username=root

spring.datasource.password=Aathira@14

spring.jpa.hibernate.ddl-auto=update

spring.jpa.show-sql=true

spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect

Employee.java :

```
package com.SpringDataJPA.SpringDataJPA.model;
```

```
import jakarta.persistence.*;
```

@Entity

@Table(name = "employee")

public class Employee {

@Id

@GeneratedValue(strategy = *GenerationType.IDENTITY*)

private Integer id;

private String name;

private String department;

public Integer getId() {

return id;

}

public void setId(Integer id) {

this.id = id;

}

public String getName() {

return name;

}

public void setName(String name) {

this.name = name;

}

public String getDepartment() {

return department;

}

public void setDepartment(String department) {

this.department = department;

}

}

EmployeeRepository.java :

```
package com.SpringDataJPA.SpringDataJPA.repository;

import org.springframework.data.jpa.repository.JpaRepository;

import com.SpringDataJPA.SpringDataJPA.model.Employee;

public interface EmployeeRepository extends JpaRepository<Employee, Integer>{

}
```

EmployeeService.java :

```
package com.SpringDataJPA.SpringDataJPA.service;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import com.SpringDataJPA.SpringDataJPA.model.Employee;
import com.SpringDataJPA.SpringDataJPA.repository.EmployeeRepository;

import jakarta.transaction.Transactional;

@Service
public class EmployeeService {

    @Autowired
    private EmployeeRepository employeeRepository;

    @Transactional
    public void addEmployee(Employee employee) {
```

```

        employeeRepository.save(employee);
    }

}

```

EmployeeController.java :

```

package com.SpringDataJPA.SpringDataJPA.controller;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

import com.SpringDataJPA.SpringDataJPA.model.Employee;
import com.SpringDataJPA.SpringDataJPA.service.EmployeeService;

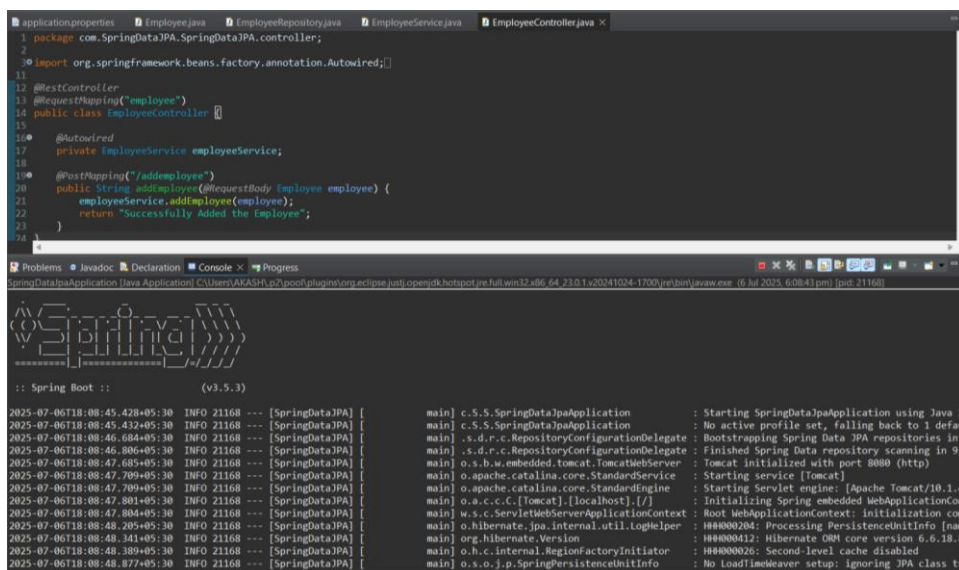
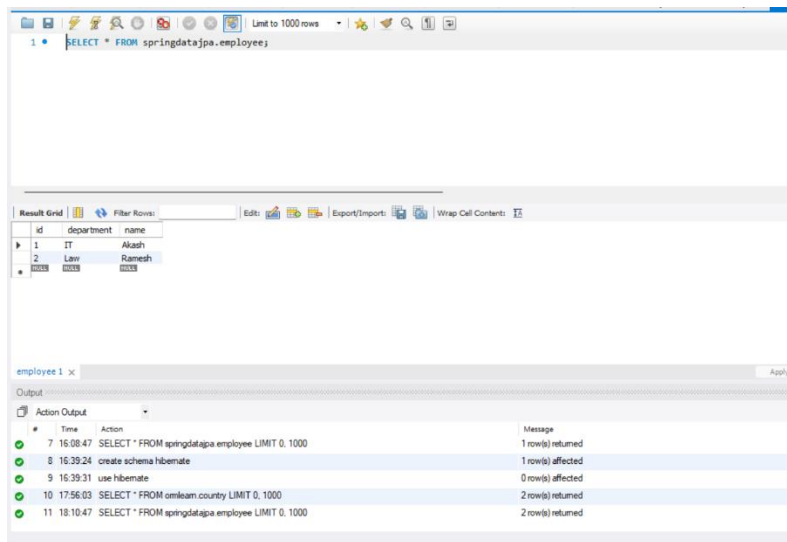
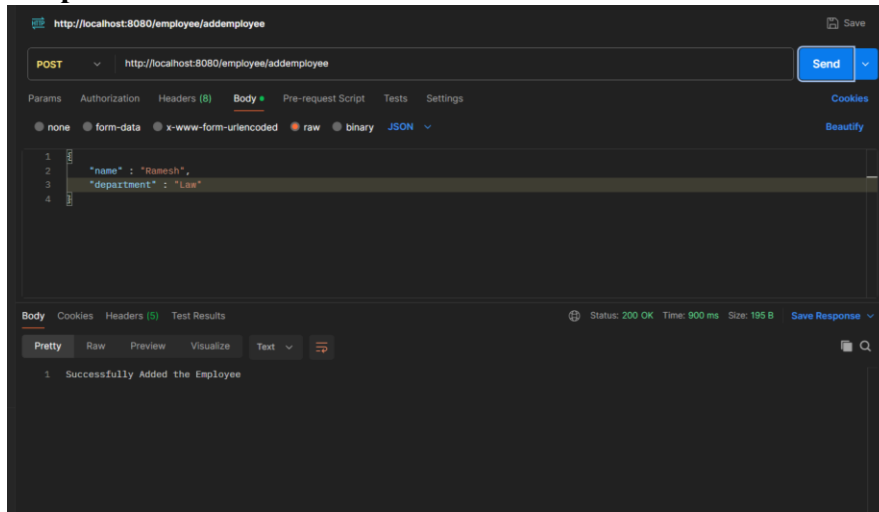
@RestController
@RequestMapping("employee")
public class EmployeeController {

    @Autowired
    private EmployeeService employeeService;

    @PostMapping("/addemployee")
    public String addEmployee(@RequestBody Employee employee) {
        employeeService.addEmployee(employee);
        return "Successfully Added the Employee";
    }
}

```

Output :



```
application.properties Employee.java EmployeeRepository.java EmployeeService.java EmployeeController.java
1 package com.SpringDataJPA.SpringDataJPA.controller;
2
3 import org.springframework.beans.factory.annotation.Autowired;
4
5 @RestController
6 @RequestMapping("/employee")
7 public class EmployeeController {
8
9     @Autowired
10     private EmployeeService employeeService;
11
12     @PostMapping("/addEmployee")
13     public String addEmployee(@RequestBody Employee employee) {
14         employeeService.addEmployee(employee);
15         return "Successfully Added the Employee";
16     }
17 }
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