Date : 18/01/2021
Spring Boot 9AM
Mr. RAGHU

Spring Data JPA : Database operations
[spring-boot-starter-data-jpa]

=> JDBC : Works based on SQL Query, given by Programmer
=> JPA (Specification given by Sun/Oracle), that generates all SQLs based on operations.
=> For a Specification we must follow one implementation ie Hibernate
=> Even Hibernate , programmer has to do code manually for operations, transactions and pooling..etc.

=> In Spring Data JPA, code is automated. It internally follows Hibernate with JPA concept.

------Properties ----------
Connection Propreties (DataSource)
driver-class, url, username, password.

JPA Properties
show-sql (true/false) : To Display Generated SQL on console
ddl-auto : create/update/validate/create-drop
dialect(database-platform): It generates SQL queries based on database.

SQL: It is database dependent.
If we write one SQL query for Oracle,
it may/may not work for SQLServer DB.

*)Dialect solves above problem by generating query at runtime.
So, dialect is different for every DB.

---

*) For your Module (Ex: Employee, Admin, Student ..etc)
You do not define Operations code. Just define interface,
that must implement one of below interfaces
i) CrudRepository<T, ID>
ii) PagingAndSortingRepository<T, ID>
iii) JpaRepository<T, ID>.

coding files:
1. Model class/Entity class
2. Repository Interface
3. Runner class for Testing opeations

----------Basic Application----------
** MySQL: https://dev.mysql.com/downloads/windows/installer/8.0.html
cmds
```
mysql> show databases;
mysql> create database boot9am;
mysql> use boot9am
mysql> show tables;
mysql> select * from emptab;
```

1. Create one Starter Project
Name : SpringBoot2DataJpaMySQLFirstApp
Dep : Data Jpa, Lombok, MySQL Driver

2. application.properties
```
#DataSource(Connection)
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
spring.datasource.url=jdbc:mysql://localhost:3306/boot9am
spring.datasource.username=root
spring.datasource.password=root

# Data JPA Properties
spring.jpa.show-sql=true
spring.jpa.hibernate.ddl-auto=create
spring.jpa.database-platform=org.hibernate.dialect.MySQL8Dialect
```

----application.yml-----------------
```
spring:
  datasource:
    driver-class-name: com.mysql.cj.jdbc.Driver
    password: root
    url: jdbc:mysql://localhost:3306/boot9am
    username: root
  jpa:
    database-platform: org.hibernate.dialect.MySQL8Dialect
    hibernate:
      ddl-auto: create
    show-sql: true
```
----
3. Model class

```
package in.nareshit.raghu.model;
//ctrl+shift+O
import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.Id;
import javax.persistence.Table;

import lombok.Data;

@Data
@Entity
@Table(name="emptab")
public class Employee {

        @Id
        @Column(name="eid")
        private Integer empId;

        @Column(name="ename")
        private String empName;

        @Column(name="esal")
        private Double empSal;
}
```

4.** Repository Interface
   T   = Model className   = Employee
   ID = DataType(of PrimaryKey) = Integer

5. Runner class

```
package in.nareshit.raghu.runner;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.CommandLineRunner;
import org.springframework.stereotype.Component;

import in.nareshit.raghu.model.Employee;
import in.nareshit.raghu.repo.EmployeeRepository;

@Component
public class EmployeeTestRunner implements CommandLineRunner {

        @Autowired
        private EmployeeRepository repo;

        @Override
        public void run(String... args) throws Exception {
                //find out impl class name
                //System.out.println(repo.getClass().getName());

                Employee emp = new Employee();
                emp.setEmpId(100);
                emp.setEmpName("ABC");
                emp.setEmpSal(200.0);

                repo.save(emp);

        }

}
```

---

*) ddl-auto: create , it will drop table if exist and create new one.

---Core Java---

Q) What is Reflection API?
Q) How to read members of a give class?
   print fields/methods/constructor details ...
Q) What is Proxy class and object?
Q) What is Dyanmic Proxy?
https://docs.oracle.com/javase/8/docs/technotes/guides/reflection/proxy.html
https://github.com/javabyraghu/DynamicProxyExample

Q) What are Generics?
Q) What is Generic class, method, field?
Q) What is wild card Char in Genrics?
Q) What is <S extends T> and <S super T> in generics?

Q) What is camelCase Rule in Java?
Q) Difference between camel case and kebab case?

---JDBC------------------------------
Q) JDBC-4 # What Auto-Loading/Auto-Detection/Auto-Register of Driver class?

-SQL-------------------------
Q) What is DDL, DML, TCL ...?

---Hibernate-------------------------------
Q) Which DataType can be used to create primaryKey variable in Hibernate/Jpa?

---Spring --------------------
Q) What is @Repository? Where can we add this?
Q) Can we write @Autowired on interface variable?