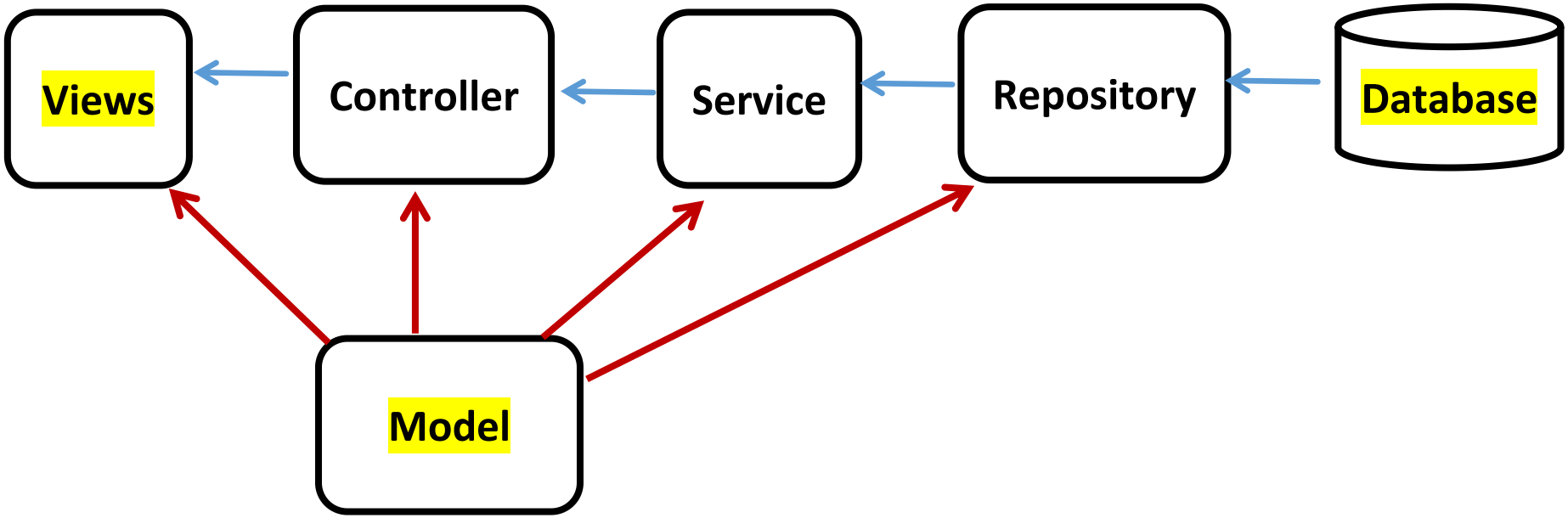
SEN 207 Practical Project 2

1. Spring boot MVC Design:



2. Note:

Spring	Tools	Functions
Database	MYSQL	Store data
Repository	Interface	Access Database
Service	Class	Logic Design
Controller	Class	Route Design
View	HTML	User Interface
Model	Class	Object Design

3. CRUD Functionalities:

Student: Create, View All, Update and Delete(CRUD)

Book: Create, View All, Update and Delete(CRUD)

Car: Create, View All, Update and Delete(CRUD)

4. Object Definition (Fields and Attributes):

Student: Matric Number, Name, DOB, Department, level, email, phone

Book: Book Id, Title, Author name, ISBN, Publisher

Car: Car Id, Company, Car Model, cylinder size, Tyre size, Gear type

5. Database Properties

Unique Identifiers:fields that are unique in a table e.g. Matric Number, phone, email

Primary Key:field that are unique in a table used for record identification

Foreign key:Primary key in another table used

Field: Column in the table e.g. name, level, phone

Record:Individual record

id	created_date	dob	fname	gender	is_active	is_blocked	lname	mname	password	phone	private_email	user_type
1	2024-12-26 14:43:58.000000	NULL	Mary	female	0	0	Kama	NULL		5780	mary@gmail.com	NULL
2	2024-12-26 14:48:11.000000	NULL	ikouwem	male	0	0	usoh	NULL	etinan	806	ikouwem2013@gmail.com	NULL
3	2024-12-26 14:49:02.000000	NULL	Chidimma	female	0	0	Agubata	NULL	chidimma	3467	chidimma@gmail.com	NULL
4	2024-12-26 14:50:13.000000	NULL	Dickson	male	0	0	Dako	NULL	dako	456	dickson@gmail.com	NULL
6	2024-12-26 15:00:56.000000	NULL	Tonyede	female	0	0	Briggs	NULL	grtuyoio	899	tonyebriggs@gmail.com	NULL
7	2024-12-26 15:05:18.000000	NULL	Tony	male	0	0	Briggs	NULL	ertyu	4321	tony@gmail.com	NULL
8	2024-12-26 15:27:59.000000	NULL	Tosin	male	0	0	Akin	NULL	tosin	87321	tosin@gmail.com	NULL

Fields:password, fname, lname, email

Record:”2 Usoh ikouwem male ikouwem2013@gmail” is one record

6. JPA(Java Persistence API)

@Entity=Create table

@Id=Primary Key

@GeneratedValue(strategy=Identity)=Automatic Numbering of each record

@Column(unique=true)=Make field a unique identifer

7. Serivce Methods

findAll():Displays all record in the Database

getById():Display only the record with the given id

Save(): creates a new record in the database and can also Update an existing record

deleteById():Delete individual record

8. Relationships

@OneToOne

@ManyToOne

@OneToMany

@ManyToMany

9. Thymeleaf

```
<!DOCTYPE html>

<html xmlns:th="http://www.thymeleaf.org">

<head>
```

```
<title>Students</title>
<link rel="stylesheet" href="/css/styles.css">
</head>
<body>
<h1>Students</h1>
<!-- Add New Student Form -->
<form th:action="@{/students}" method="post" th:object="${student}">
<label>Name: <input type="text" th:field="*{name}" required></label><br>
<label>Email: <input type="email" th:field="*{email}" required></label><br>
<label>Department:
        <select th:field="*{department.id}">
        <option th:each="dept : ${departments}" th:value="${dept.id}" th:text="${dept.name}"></option>
        </select>
```

</label>

<button type="submit">Add Student</button> </form>

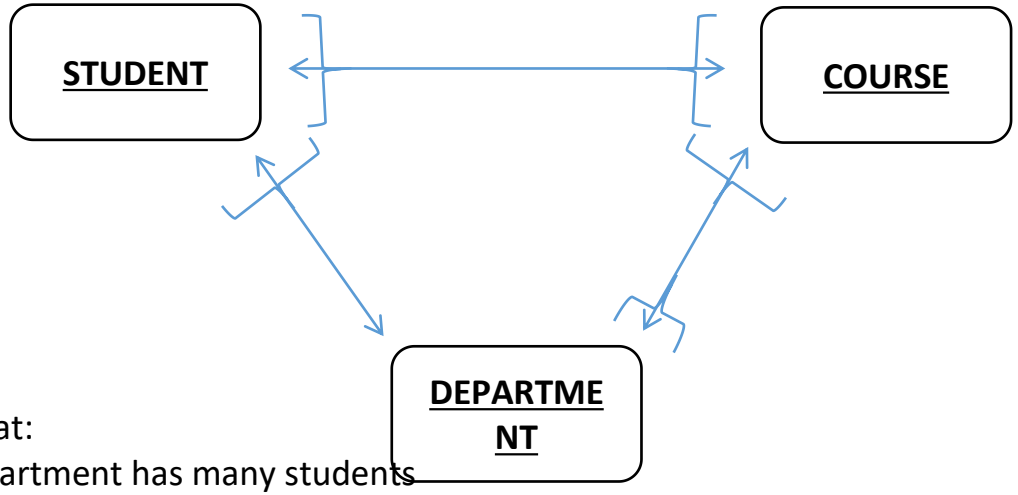
</body>

<html>

10.

SEN 207 Practical Project 3

Spring boot project for student, department and course management.



Note that:
1. a department has many students
2. a department has many courses
3. some courses can be offered by many departments
4. a student belongs to one department
5. a student can offer many courses
6. a course can be offered by many students

Student (M) ---------- (M) Course
Student (M) ---------- (1) Department
Department (M) ---------- (M) Course

Full project including models, repository, services, controllers, thymeleaf, etc

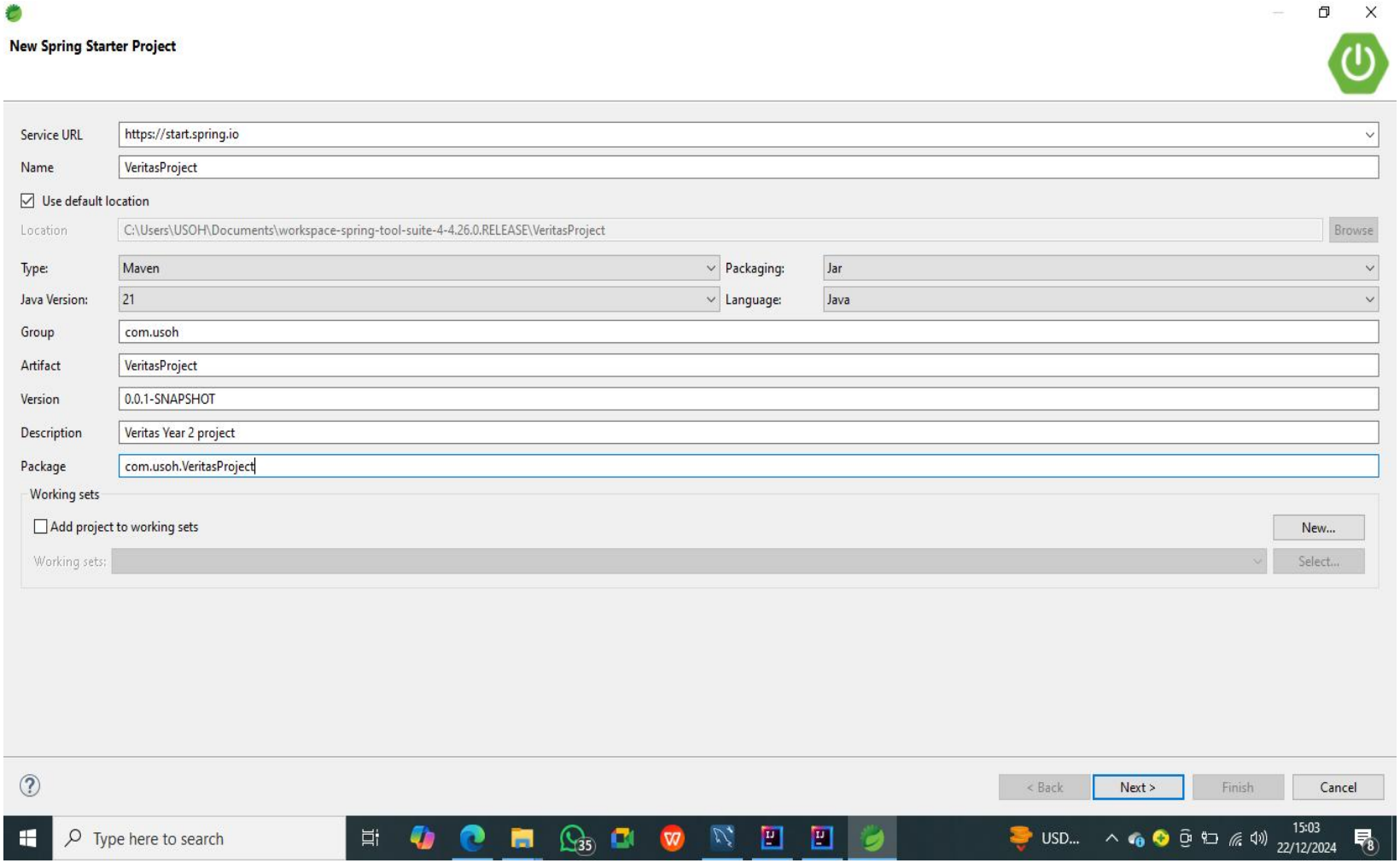
creating new students, updating student records, deleting student, view all students
creating new courses, updating course records, deleting courses, view all courses
creating new department, updating department records, deleting department, view all departments

users should be able to choose department for students, choose courses for students to offer

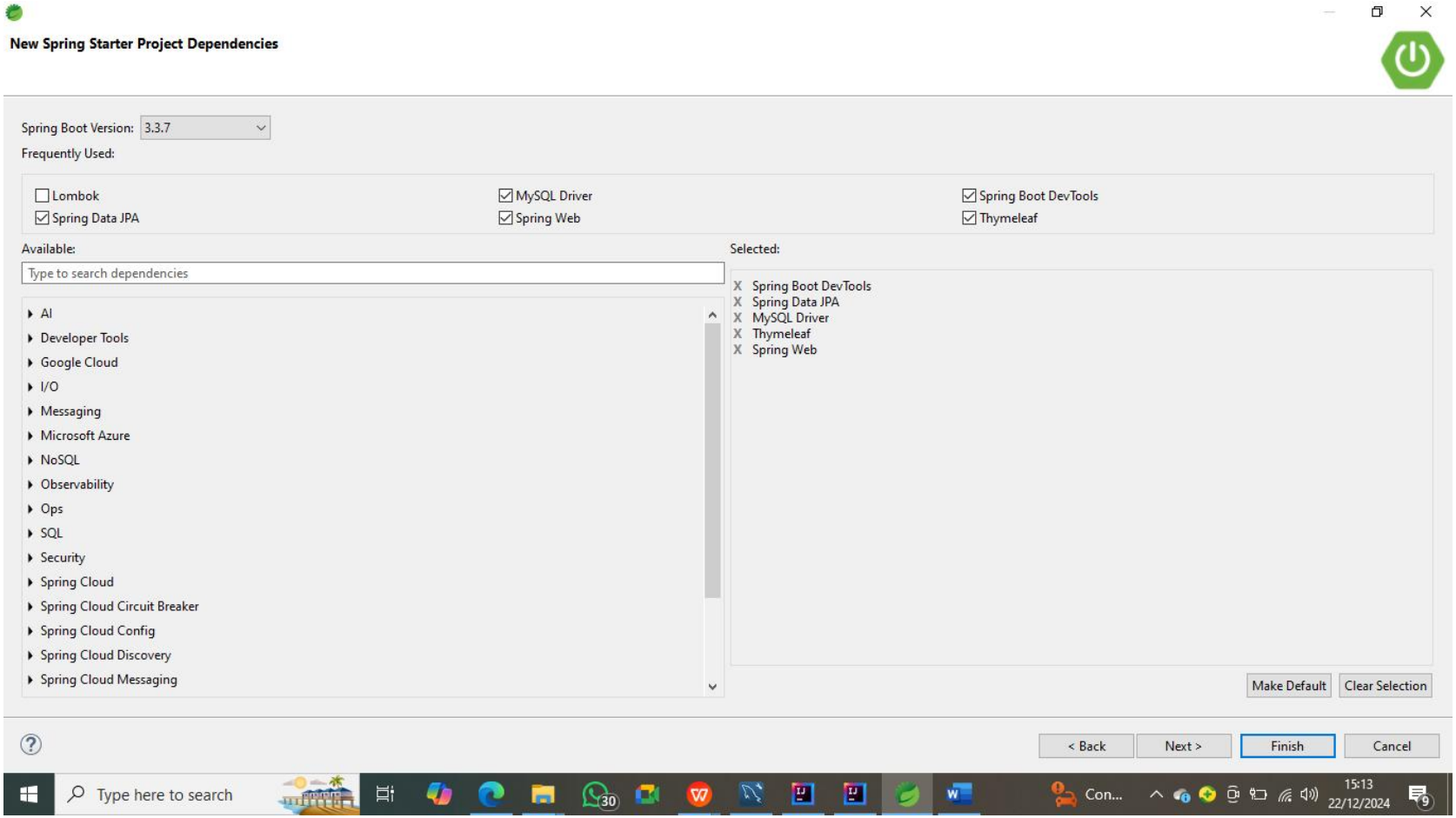
Project Requirements Recap

1. **Department**
    1. Has many **students**.
    2. Has many **courses**.
    3. Some courses can belong to **multiple departments.**
2. **Student**
    1. Belongs to one **department**.
    2. Can enroll in **many courses**.
3. **Course**
    1. Can be offered by **many students**.

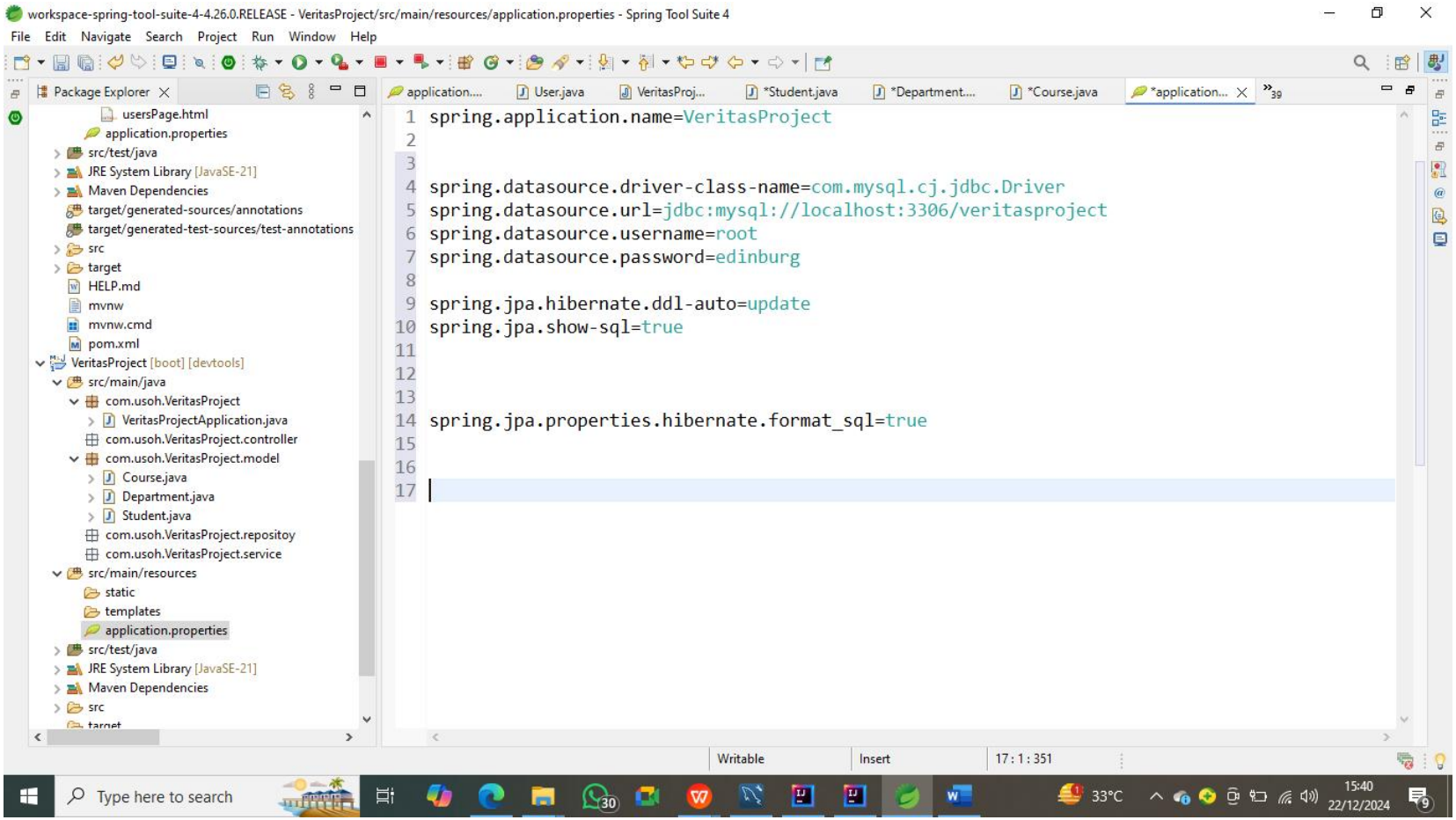
    2. Can belong to **many departments**.
4. **CRUD Functionalities:**
    1. **Student:** Create, Update, Delete, View All.
    2. **Course:** Create, Update, Delete, View All.
    3. **Department:** Create, Update, Delete, View All.
5. **User Interactions:**
    1. Assign a department to a student.
    2. Assign courses to students



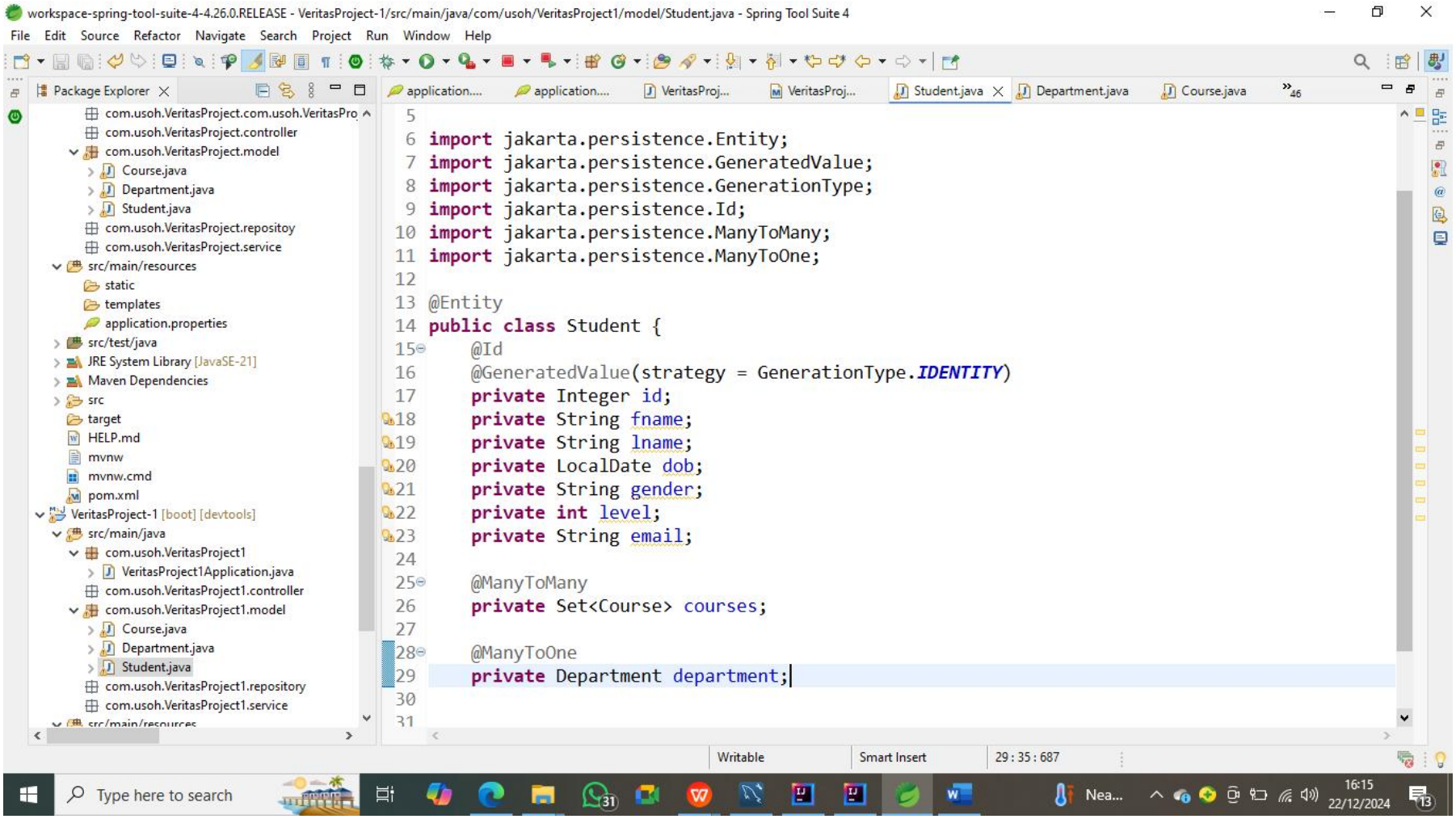
Project Setup



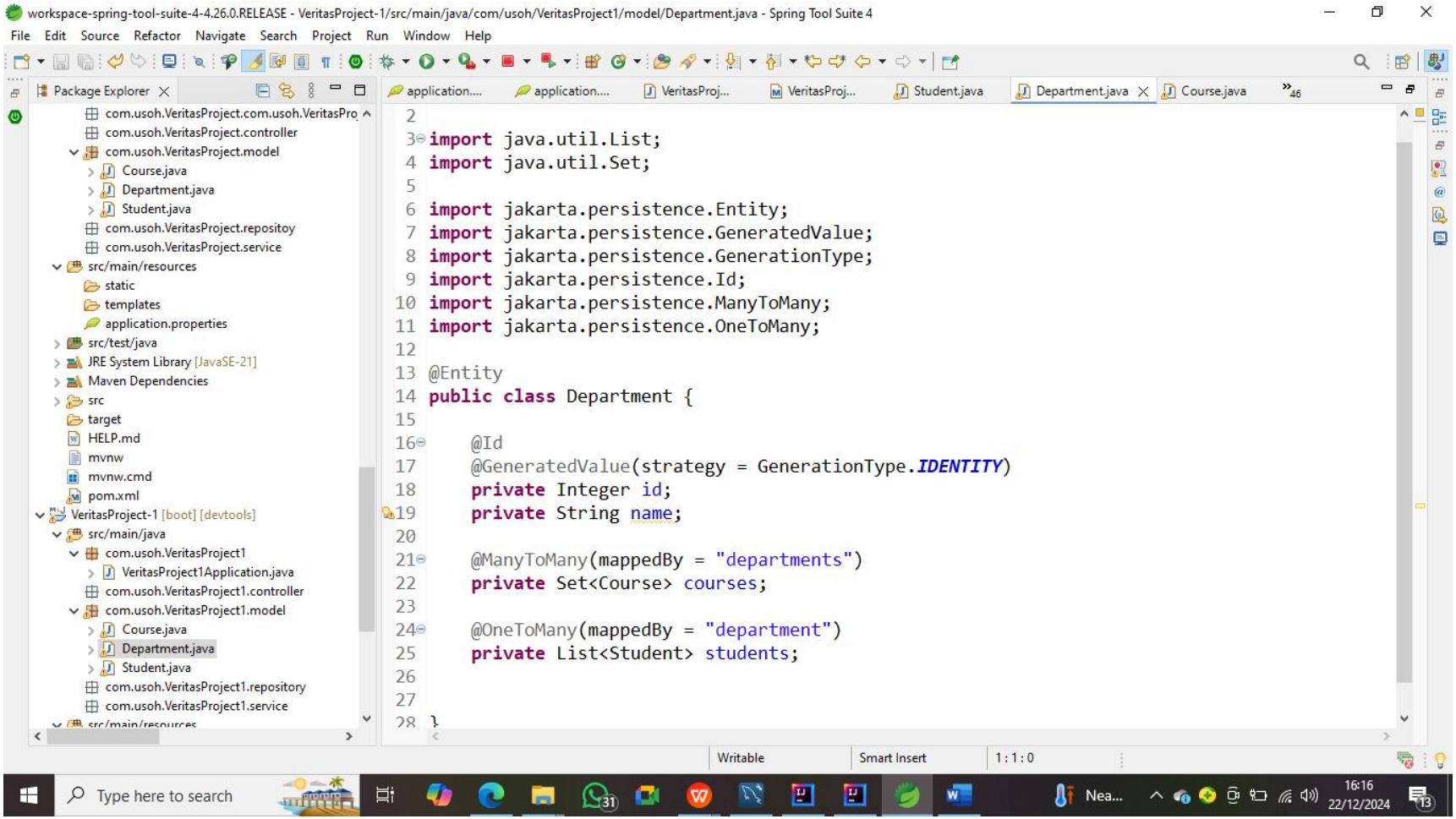
Project Dependencies



Application Properties



Student Model with JPA for Database Connection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Package Explorer
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com.usoh.VeritasProject.model
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Department.java
Student.java
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com.usoh.VeritasProject.service
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application.properties
src/test/java
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Maven Dependencies
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target
HELP.md
mvnw
mvnw.cmd
pom.xml
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Student.java
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2
3 import java.util.List;
4 import java.util.Set;
5
6 import jakarta.persistence.Entity;
7 import jakarta.persistence.GeneratedValue;
8 import jakarta.persistence.GenerationType;
9 import jakarta.persistence.Id;
10 import jakarta.persistence.ManyToMany;
11 import jakarta.persistence.OneToMany;
12
13 @Entity
14 public class Department {
15
16 @Id
17 @GeneratedValue(strategy = GenerationType.IDENTITY)
18 private Integer id;
19 private String name;
20
21 @ManyToMany(mappedBy = "departments")
22 private Set<Course> courses;
23
24 @OneToMany(mappedBy = "department")
25 private List<Student> students;
26
27
28 }
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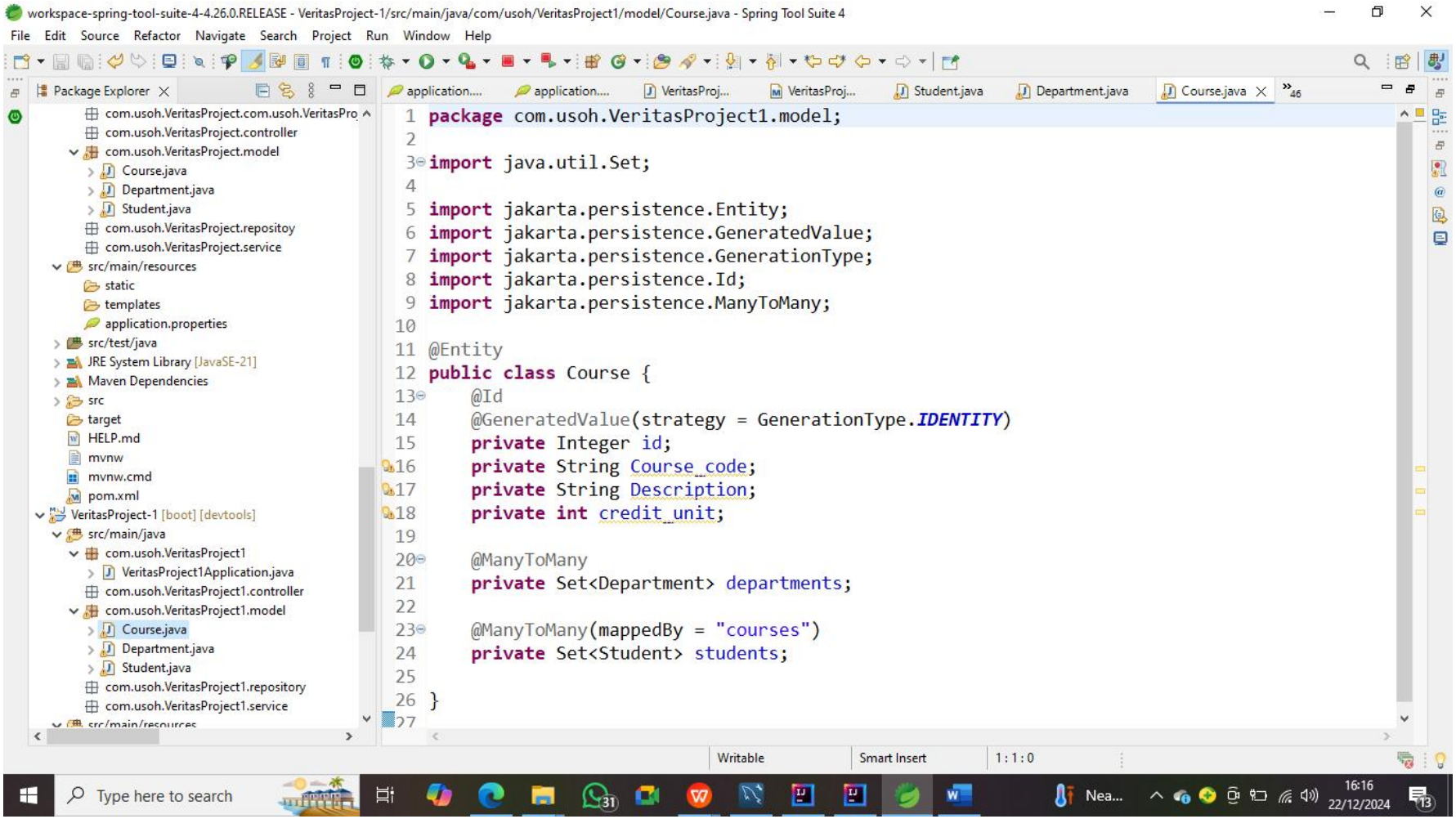
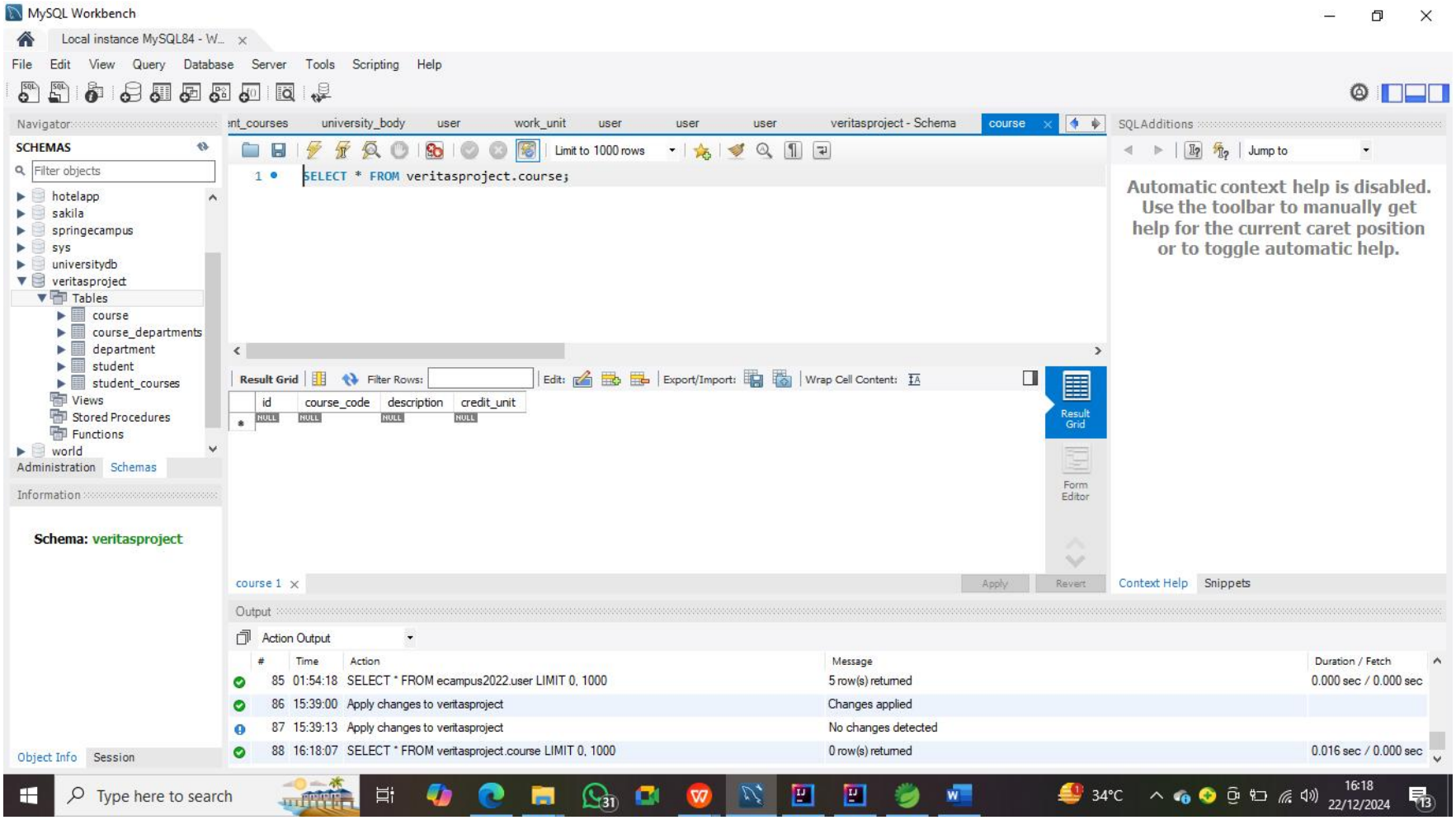
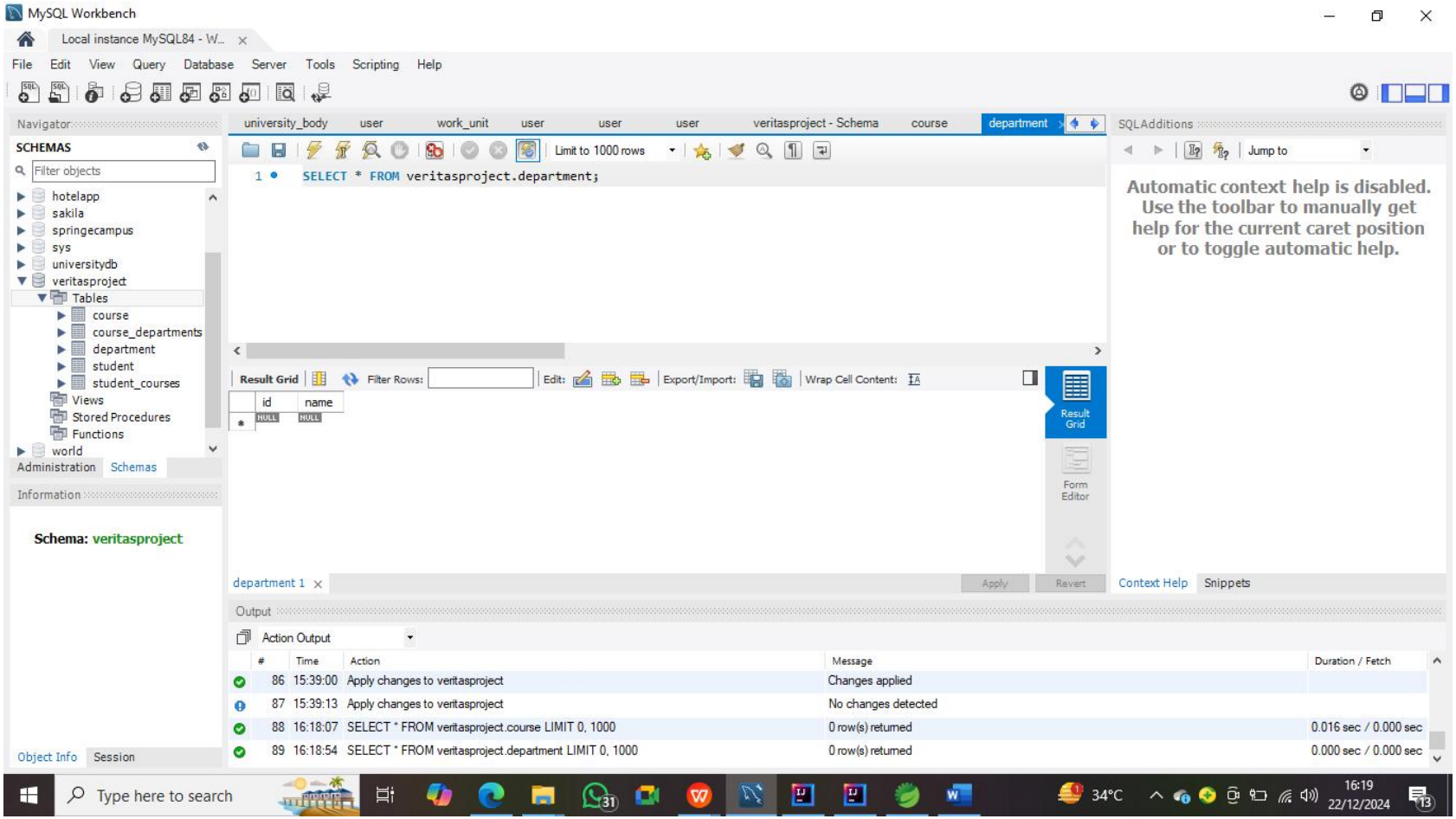
Department Model with JPA for Database Connection



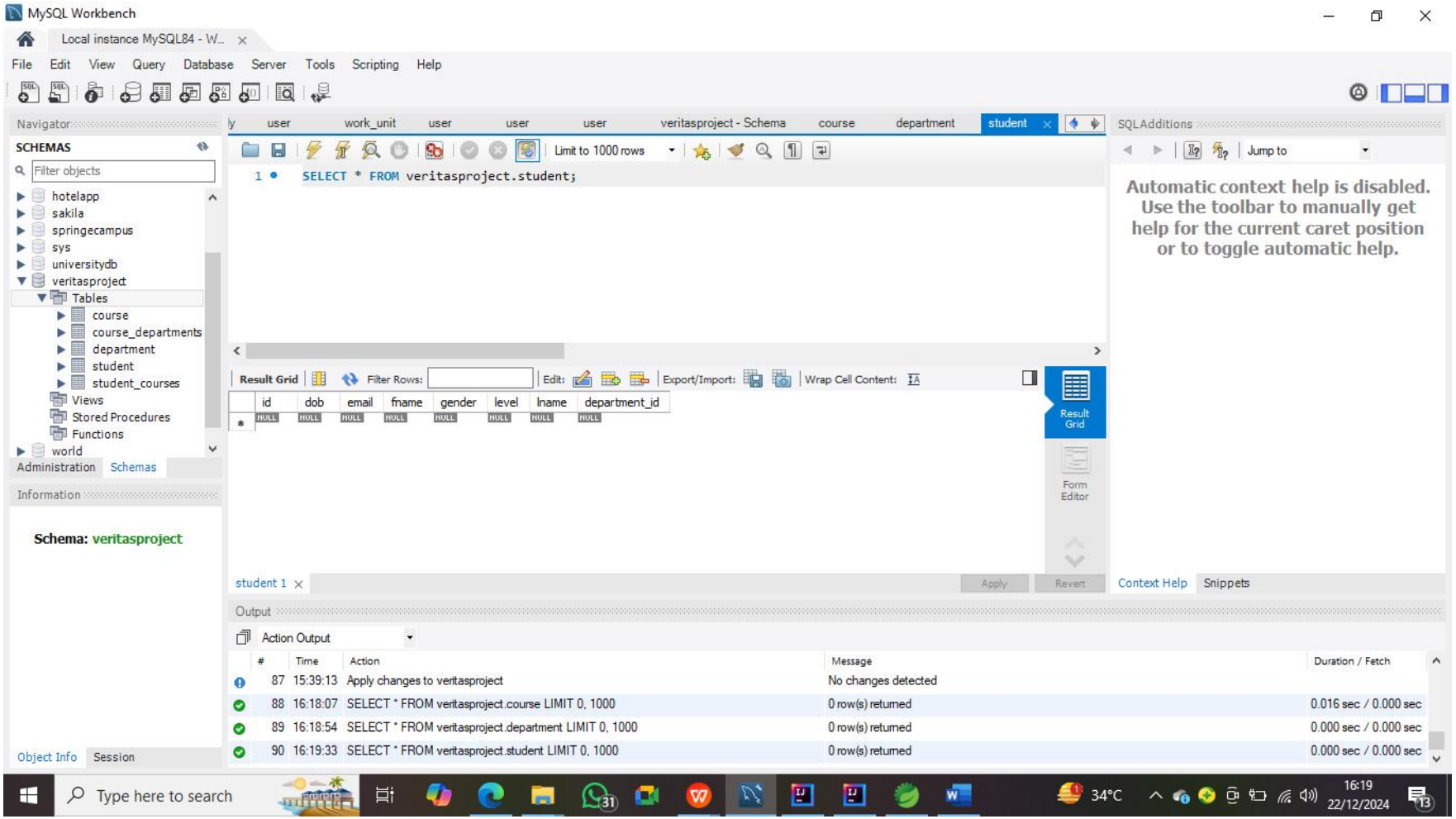
Course Model with JPA for Database Connection



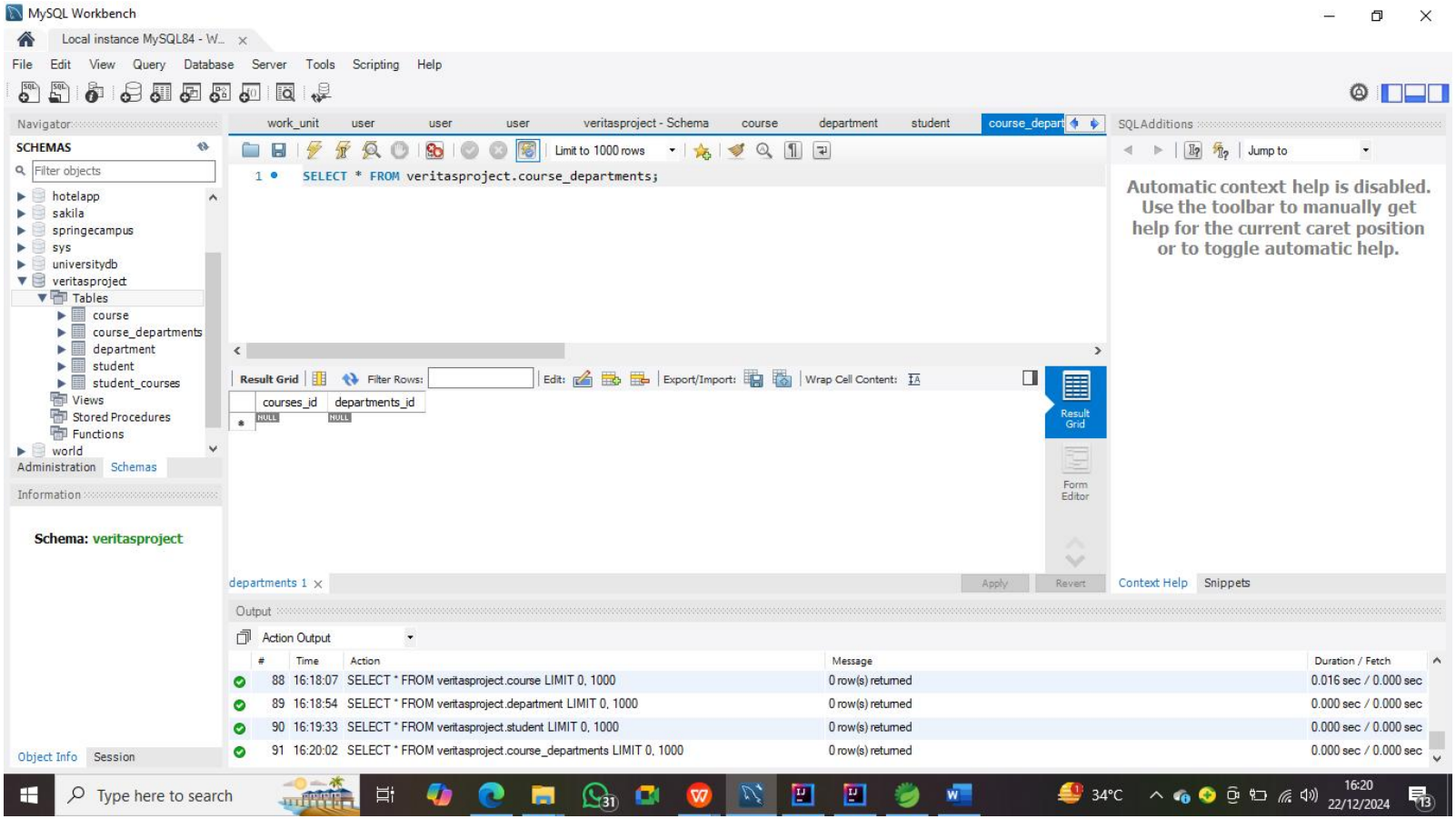
Course Table created with JPA



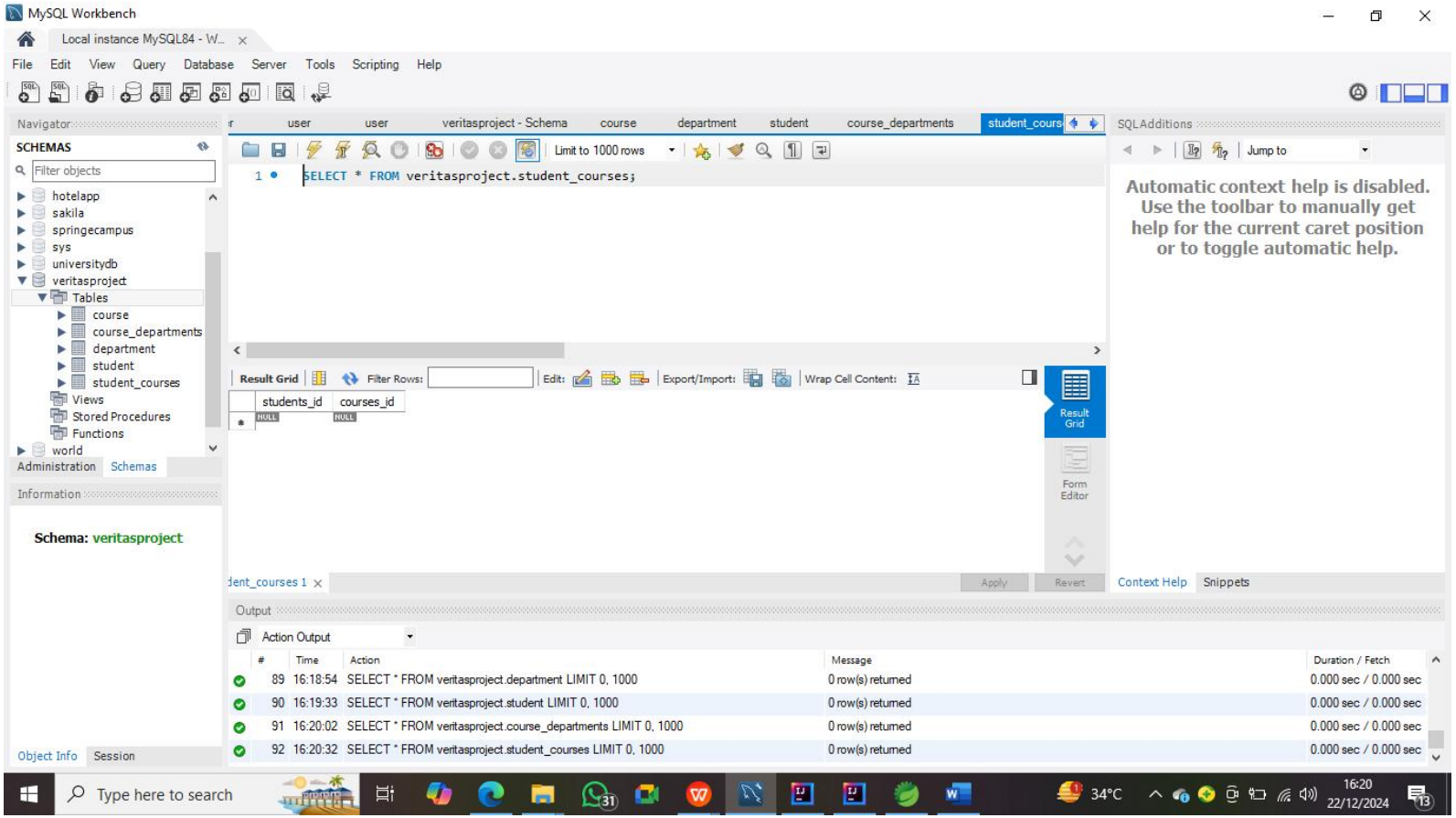
Department Table created with JPA



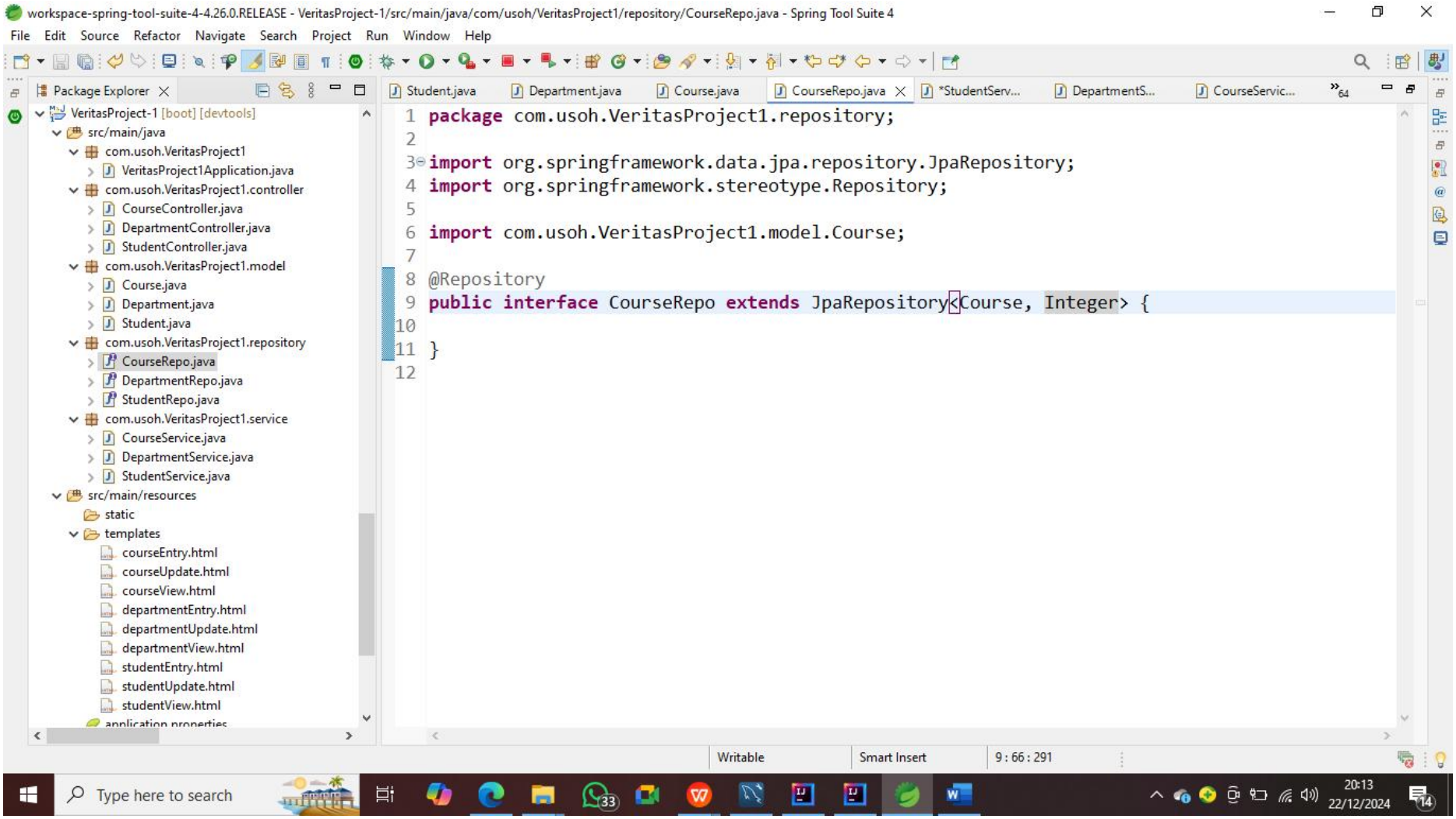
Student Table created with JPA



Course_Department Table created with JPA



Student_Courses Table created with JPA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1 package com.usoh.VeritasProject1.repository;
2
3 import org.springframework.data.jpa.repository.JpaRepository;
4 import org.springframework.stereotype.Repository;
5
6 import com.usoh.VeritasProject1.model.Course;
7
8 @Repository
9 public interface CourseRepo extends JpaRepository<Course, Integer> {
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11 }
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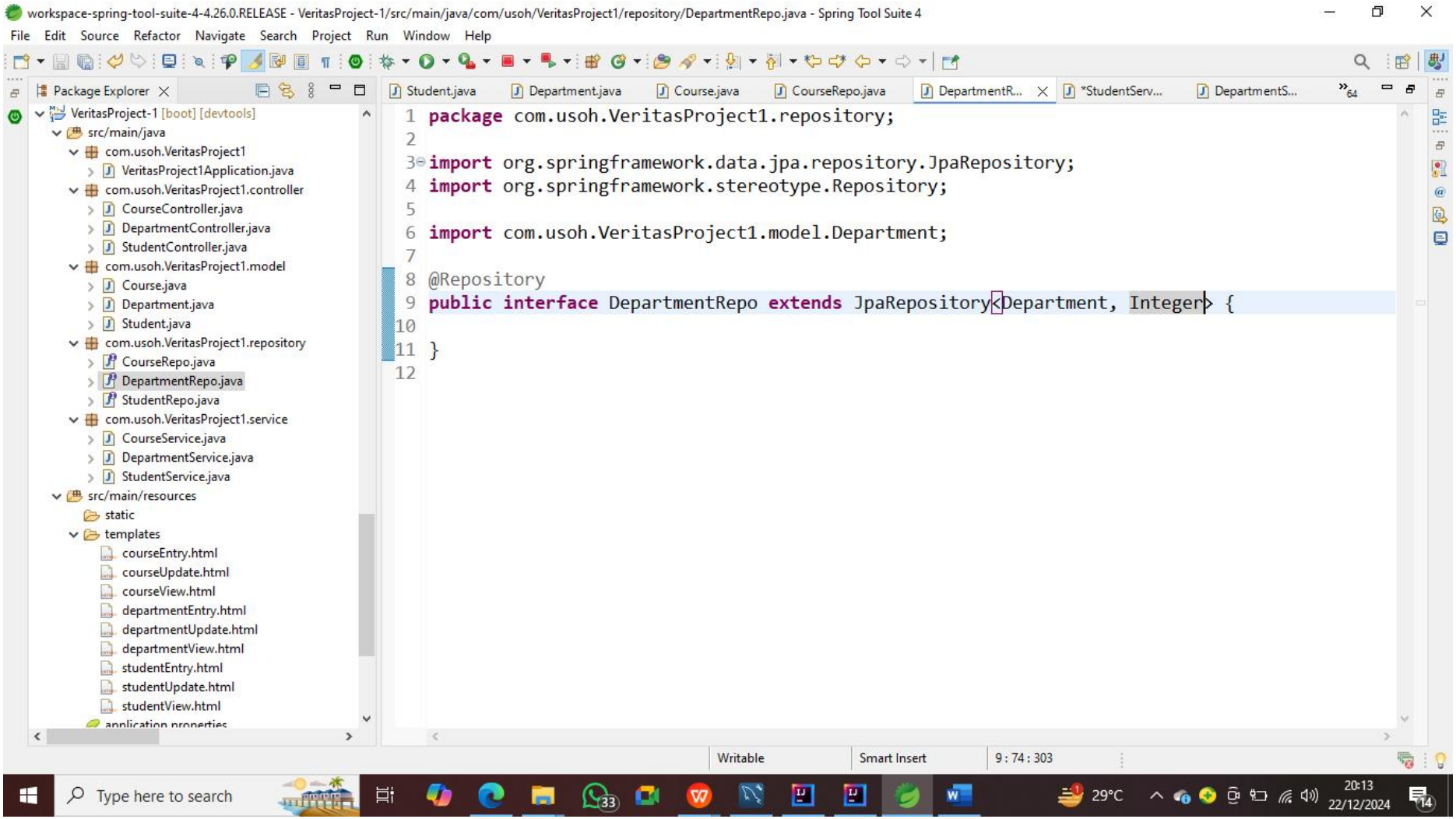
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1 package com.usoh.VeritasProject1.repository;
2
3 import org.springframework.data.jpa.repository.JpaRepository;
4 import org.springframework.stereotype.Repository;
5
6 import com.usoh.VeritasProject1.model.Department;
7
8 @Repository
9 public interface DepartmentRepo extends JpaRepository<Department, Integer> {
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11 }
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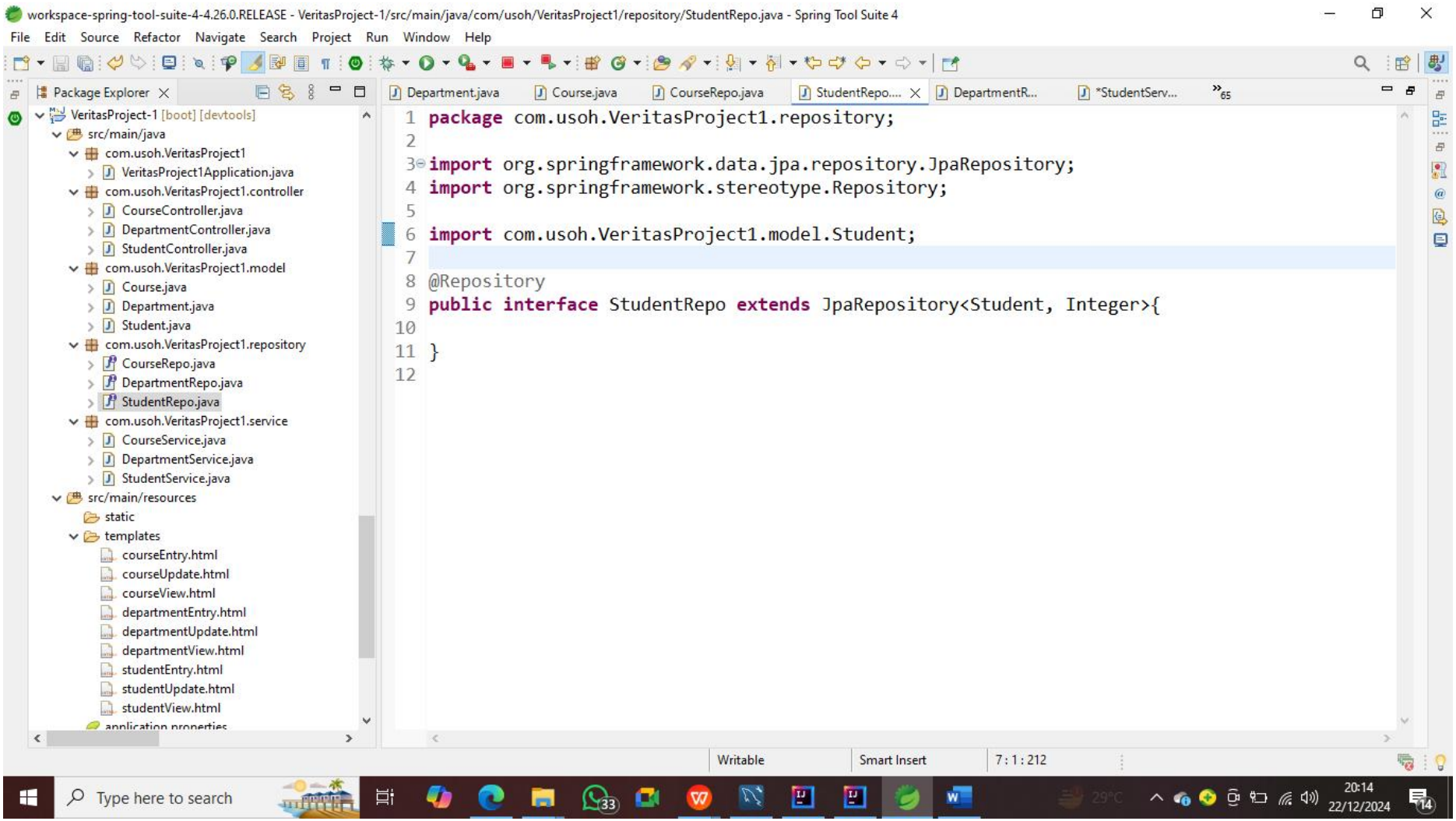
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3 import org.springframework.data.jpa.repository.JpaRepository;
4 import org.springframework.stereotype.Repository;
5
6 import com.usoh.VeritasProject1.model.Student;
7
8 @Repository
9 public interface StudentRepo extends JpaRepository<Student, Integer>{
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11 }
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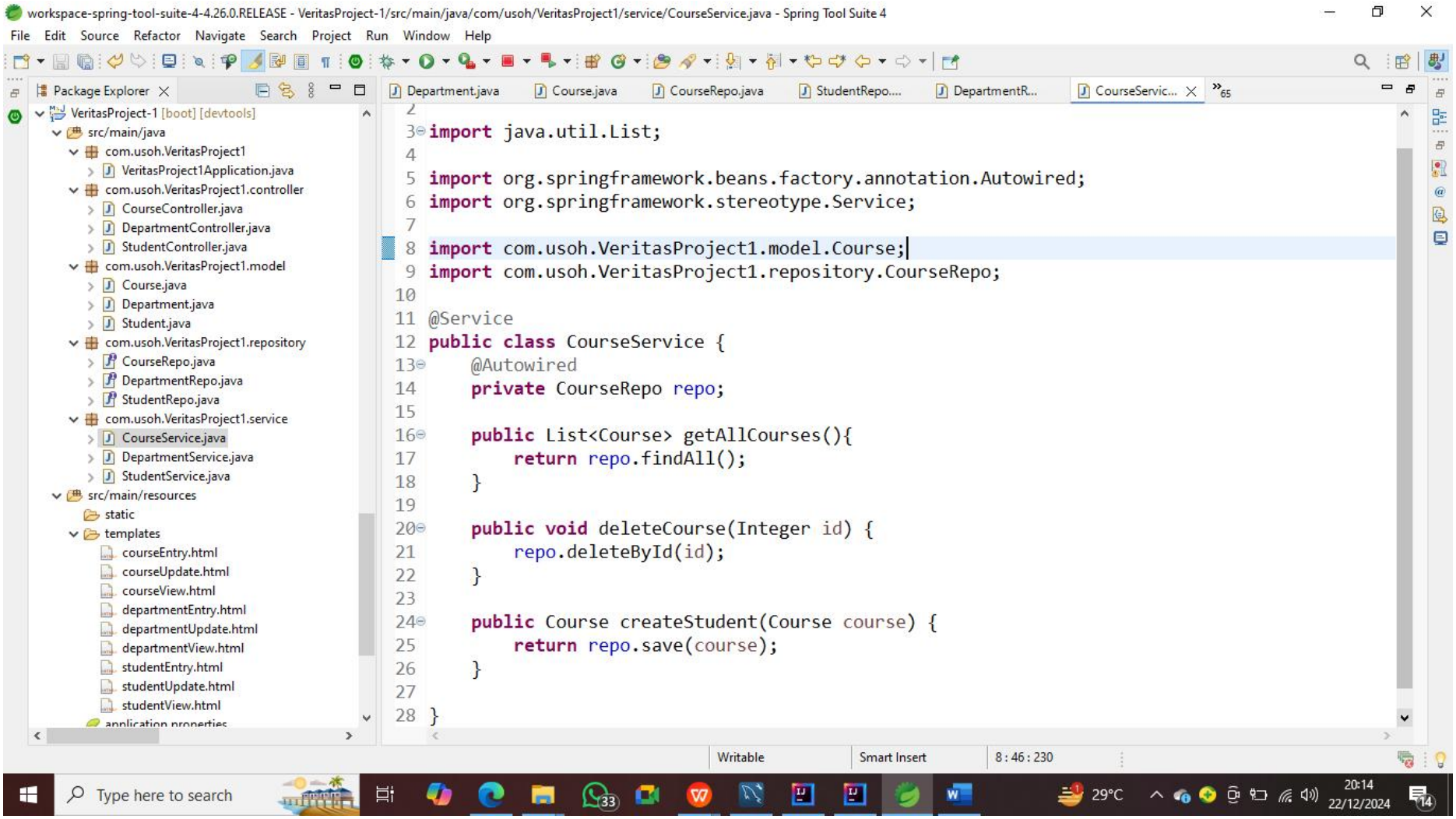
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import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import com.usoh.VeritasProject1.model.Course;
import com.usoh.VeritasProject1.repository.CourseRepo;
@Service
public class CourseService {
@Autowired
private CourseRepo repo;
public List<Course> getAllCourses(){
return repo.findAll();
}
public void deleteCourse(Integer id) {
repo.deleteById(id);
}
public Course createStudent(Course course) {
return repo.save(course);
}
}
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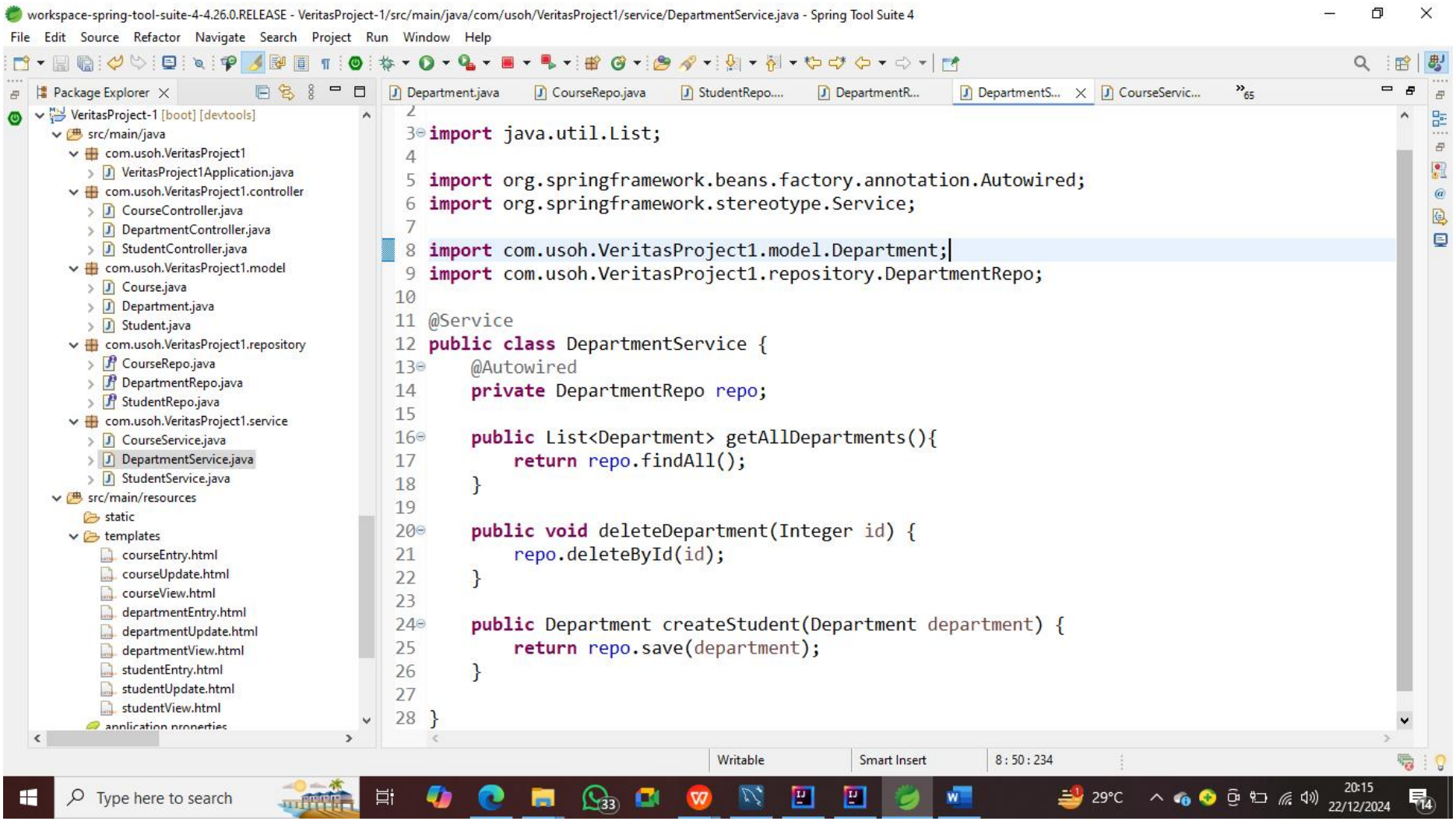
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import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import com.usoh.VeritasProject1.model.Department;
import com.usoh.VeritasProject1.repository.DepartmentRepo;
@Service
public class DepartmentService {
@Autowired
private DepartmentRepo repo;
public List<Department> getAllDepartments(){
return repo.findAll();
}
public void deleteDepartment(Integer id) {
repo.deleteById(id);
}
public Department createStudent(Department department) {
return repo.save(department);
}
}
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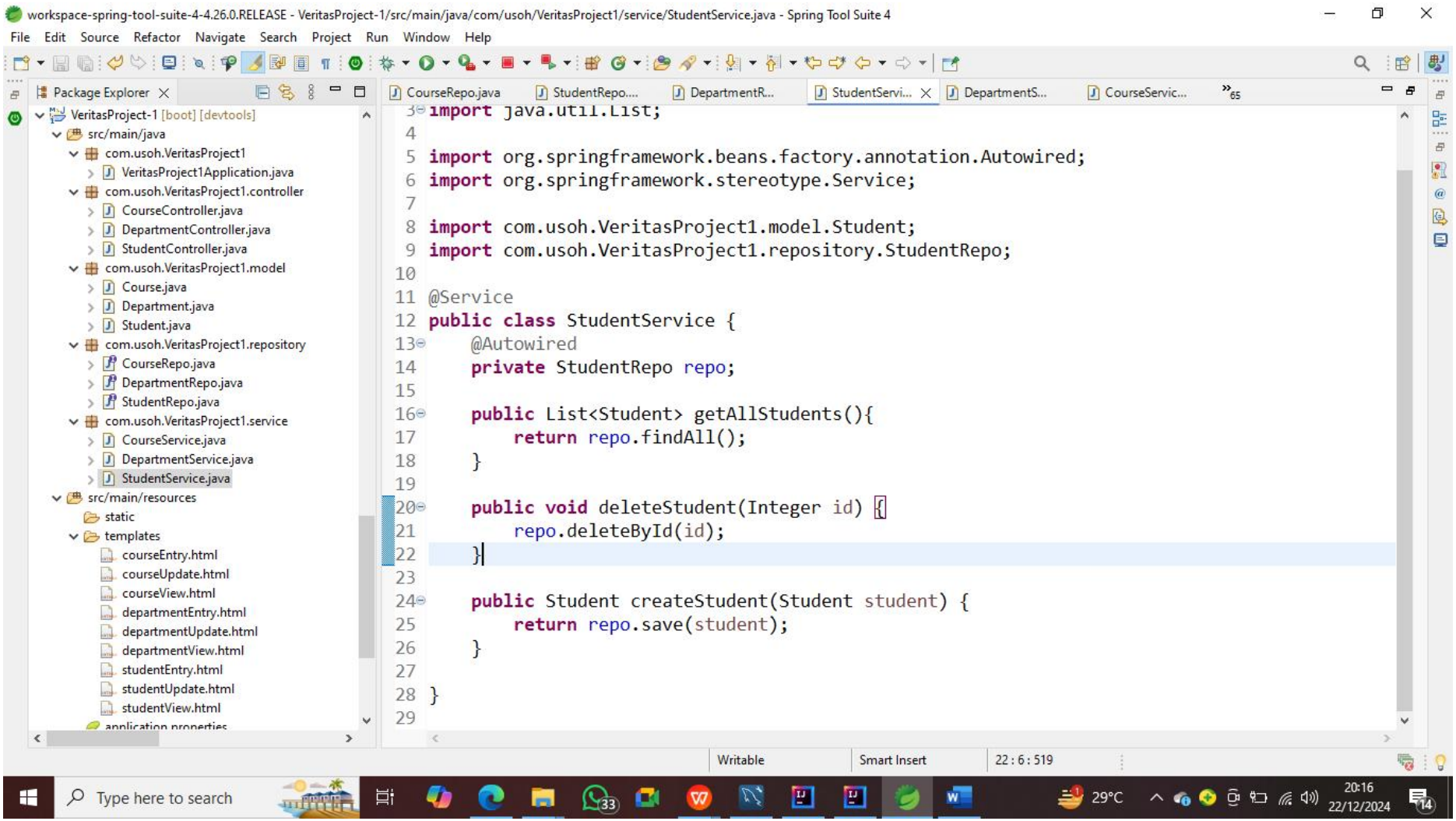
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StudentServi...
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CourseServic...
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3 import java.util.List;
4
5 import org.springframework.beans.factory.annotation.Autowired;
6 import org.springframework.stereotype.Service;
7
8 import com.usoh.VeritasProject1.model.Student;
9 import com.usoh.VeritasProject1.repository.StudentRepo;
10
11 @Service
12 public class StudentService {
13 @Autowired
14 private StudentRepo repo;
15
16 public List<Student> getAllStudents(){
17 return repo.findAll();
18 }
19
20 public void deleteStudent(Integer id) {
21 repo.deleteById(id);
22 }
23
24 public Student createStudent(Student student) {
25 return repo.save(student);
26 }
27
28 }
29
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