COURSE ENROLLEMENT MANAGEMENT SYSTEM

A MINI-PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report "**COURSE ENROLLEMENT MANAGEMENT SYSTEM**" is the Bonafide work of **"M.NITHYASHREE (230701221)"** who carried out the project work under my supervision.

Submitted for the Practical Examination held on _____

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

ABSTRACT

The **Course Enrollment Management System** is an application designed to streamline and automate the process of managing course enrollments in an educational or corporate training environment. The system allows administrators to create, update, and manage courses while enabling employees or students to enroll in these courses seamlessly. It provides a centralized platform to handle the complexities of course registration, ensuring accuracy, efficiency, and real-time tracking.

The system reduces manual efforts, minimizes errors, and provides an enhanced user experience for both administrators and users. Its modular design allows easy integration into existing educational or corporate infrastructure while ensuring flexibility for customization to meet specific needs.

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INTRODUCTION

The COURSE ENROLLMENT MANAGEMENT SYSTEM streamlines the process of managing the course and enrollments for educational or training purposes. It enables administrators to create, update, and manage courses while allowing users to enroll seamlessly . The system ensures data security, scalability, and operational efficiency through automated workflow and a robust database. Therefore it enhances the user experience.

SYSTEM SPECIFICATIONS

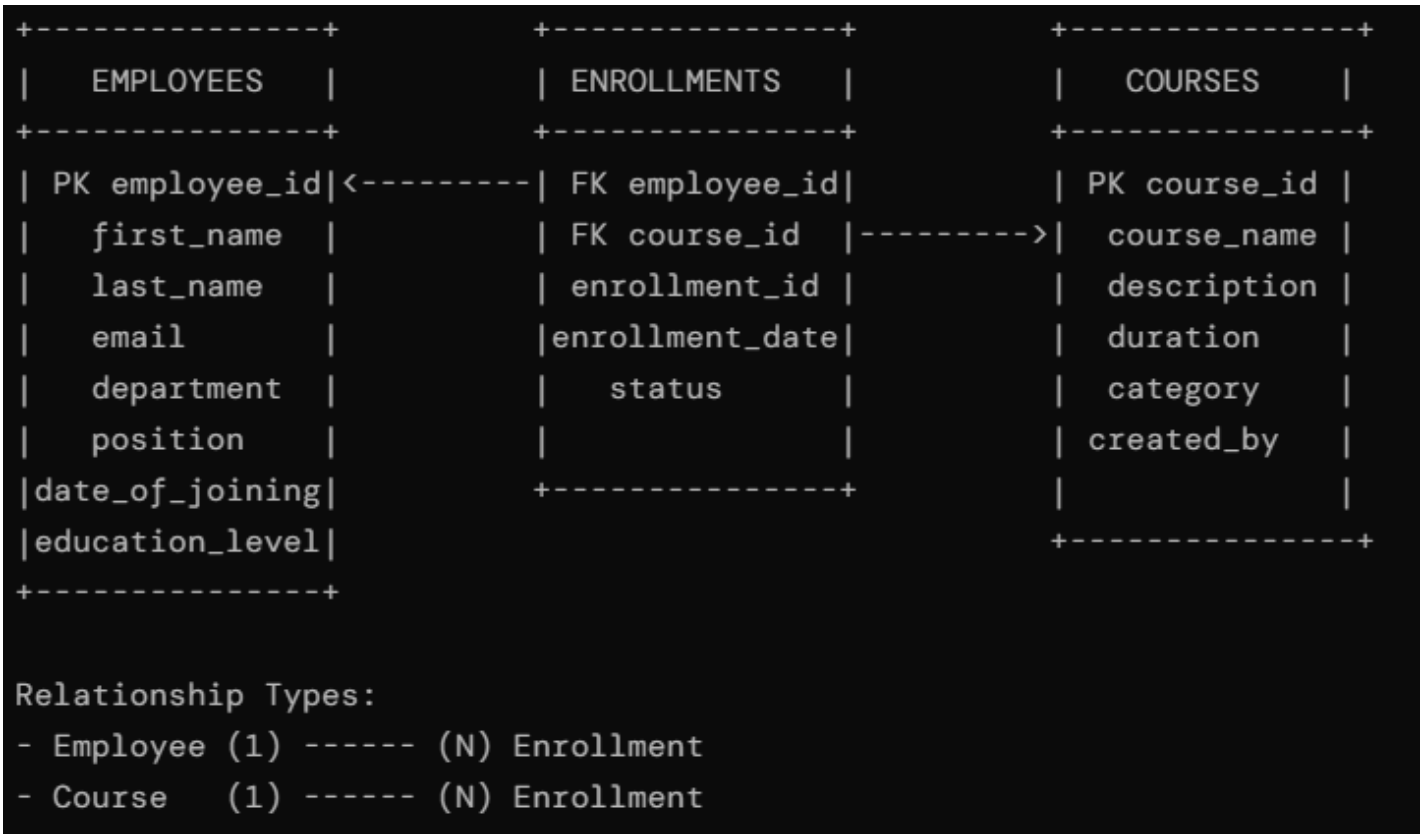
HARDWARE SPECIFICATIONS:

- PROCESSOR : Ryzen 5
- MEMORY SIZE : 8GB(Minimum)
- HARD DISK : 500 GB of free space

SOFTWARE SPECIFICATIONS:

- PROGRAMMING LANGUAGE : Java, SQL, React.js
- FRONT-END : React.js
- BACK-END : MySQL, JAVA
- OPERATING SYSTEM : Windows 11

ER DIAGRAM


EMPLOYEES
PK employee_id
first_name
last_name
email
department
position
date_of_joining
education_level
ENROLLMENTS
FK employee_id
FK course_id
enrollment_id
enrollment_date
status
COURSES
PK course_id
course_name
description
duration
category
created_by
Relationship Types:
- Employee (1) ------ (N) Enrollment
- Course (1) ------ (N) Enrollment

NORMALIZATION

Step 1: First Normal Form (1NF)

The system is in 1NF as each column contains atomic values and no repeating groups:

- **Employees**: employee_id (PK), first_name, last_name, email, department, position, date_of_joining, education_level
- **Courses**: course_id (PK), course_name, course_description, duration, category, created_by
- **Enrollments**: enrollment_id (PK), employee_id (FK), course_id (FK), enrollment_date, status

Step 2: Second Normal Form (2NF)

The system is in 2NF as all non-key attributes are fully dependent on the primary key. Each table meets this condition:

- **Employees**: All attributes depend on employee_id.
- **Courses**: All attributes depend on course_id.
- **Enrollments**: Attributes like enrollment_date and status depend on the composite key of employee_id and course_id.

Step 3: Third Normal Form (3NF)

The system is in 3NF after eliminating transitive dependencies. There are no transitive dependencies in these tables, as all non-key attributes are directly dependent on the primary key.

Normalized Tables (3NF):

- **Employees**: employee_id (PK), first_name, last_name, email, department, position, date_of_joining, education_level
- **Courses**: course_id (PK), course_name, course_description, duration, category, created_by
- **Enrollments**: enrollment_id (PK), employee_id (FK), course_id (FK), enrollment_date, status

This design reduces redundancy and ensures data integrity by maintaining clear dependencies and relationships between tables.

Program:

Spring Boot Java Backend:

Package model:

Coruse.java

```
package com.example.demo.model;

import jakarta.persistence.Entity;
import jakarta.persistence.GeneratedValue;
import jakarta.persistence.GenerationType;
import jakarta.persistence.Table;
import jakarta.persistence.Id;

@Entity
@Table(name = "courses")
public class Course {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int courseId;

    private String courseName;
    private String courseDescription;
    private int duration;
    private String category;
    private String createdBy;

    // Default no-argument constructor (required by JPA)
    public Course(){}

    // Constructor with parameters
    public Course(String courseName, String courseDescription, int duration, String
category, String createdBy) {
        this.courseName = courseName;
        this.courseDescription = courseDescription;
        this.duration = duration;
        this.category = category;
        this.createdBy = createdBy;
    }

    // Getters and setters
    public int getCourseId() {
        return courseId;
    }

    public void setCourseId(int courseId) {
        this.courseId = courseId;
    }

    public String getCourseName() {
        return courseName;
    }

    public void setCourseName(String courseName) {
        this.courseName = courseName;
    }

    public String getCourseDescription() {
        return courseDescription;
    }
```

```
    public void setCourseDescription(String courseDescription) {
        this.courseDescription = courseDescription;
    }

    public int getDuration() {
        return duration;
    }

    public void setDuration(int duration) {
        this.duration = duration;
    }

    public String getCategory() {
        return category;
    }

    public void setCategory(String category) {
        this.category = category;
    }

    public String getCreatedBy() {
        return createdBy;
    }

    public void setCreatedBy(String createdBy) {
        this.createdBy = createdBy;
    }
}
```

Employee.java

```
package com.example.demo.model;

import jakarta.persistence.Entity;
import jakarta.persistence.GeneratedValue;
import jakarta.persistence.GenerationType;
import jakarta.persistence.Table;
import jakarta.persistence.Id;
import java.time.LocalDate;

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

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int employeeId;

    private String firstName;
    private String lastName;
    private String email;
    private String department;
    private String position;
    private LocalDate dateOfJoining;
    private String educationLevel;
    private String password;

    public Employee() {}

    public Employee(String firstName, String lastName, String email, String department,
                    String position, LocalDate dateOfJoining, String
educationLevel,String password) {
        this.firstName = firstName;
        this.lastName = lastName;
        this.email = email;
```

```
        this.department = department;
        this.position = position;
        this.dateOfJoining = dateOfJoining;
        this.educationLevel = educationLevel;
        this.password = password;

    }

    // Getters and Setters
    public int getEmployeeId() {
        return employeeId;
    }

    public void setEmployeeId(int employeeId) {
        this.employeeId = employeeId;
    }

    public String getFirstName() {
        return firstName;
    }

    public void setFirstName(String firstName) {
        this.firstName = firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public void setLastName(String lastName) {
        this.lastName = lastName;
    }

    public String getEmail() {
        return email;
    }

    public void setEmail(String email) {
        this.email = email;
    }

    public String getDepartment() {
        return department;
    }

    public void setDepartment(String department) {
        this.department = department;
    }

    public String getPosition() {
        return position;
    }

    public void setPosition(String position) {
        this.position = position;
    }

    public LocalDate getDateOfJoining() {
        return dateOfJoining;
    }

    public void setDateOfJoining(LocalDate dateOfJoining) {
        this.dateOfJoining = dateOfJoining;
    }

    public String getEducationLevel() {
```

```
        return educationLevel;
    }

    public void setEducationLevel(String educationLevel) {
        this.educationLevel = educationLevel;
    }

    public String getPassword() {
        return password;
    }

    public void setPassword(String password) {
        this.password = password;
    }
}
```

Enrollment.java

```
package com.example.demo.model;

import jakarta.persistence.*;

import java.time.LocalDate;

@Entity
public class Enrollment {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int enrollmentId;

    @ManyToOne
    @JoinColumn(name = "employee_id", nullable = false) // Employee reference
    private Employee employee;

    @ManyToOne
    @JoinColumn(name = "course_id", nullable = false) // Course reference
    private Course course;

    private LocalDate enrollmentDate;

    private String status;

    // Default constructor
    public Enrollment() {
    }

    // Getters and Setters

    public int getEnrollmentId() {
        return enrollmentId;
    }

    public void setEnrollmentId(int enrollmentId) {
        this.enrollmentId = enrollmentId;
    }

    public Employee getEmployee() {
        return employee;
    }

    public void setEmployee(Employee employee) {
        this.employee = employee;
```

```
    }

    public Course getCourse() {
        return course;
    }

    public void setCourse(Course course) {
        this.course = course;
    }

    public LocalDate getEnrollmentDate() {
        return enrollmentDate;
    }

    public void setEnrollmentDate(LocalDate enrollmentDate) {
        this.enrollmentDate = enrollmentDate;
    }

    public String getStatus() {
        return status;
    }

    public void setStatus(String status) {
        this.status = status;
    }
}
```

Package controller:

CourseController.java

```
package com.example.demo.controller;

import com.example.demo.model.Course;
import com.example.demo.service.CourseService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.*;

import java.util.List;

@RestController
@RequestMapping("/api/courses")
@CrossOrigin(origins = "http://localhost:3000")  // Allow requests from your frontend
public class CourseController {

    @Autowired
    private CourseService courseService;

    // Endpoint to get all courses
    @GetMapping
    public ResponseEntity<List<Course>> getAllCourses() {
        List<Course> courses = courseService.getAllCourses();
        return ResponseEntity.ok(courses); // Return 200 OK status with the list of
courses
    }

    // Endpoint to add a course
    @PostMapping
    public ResponseEntity<String> addCourse(@RequestBody Course course) {
        courseService.addCourse(course.getCourseName(), course.getCourseDescription(),
course.getDuration(), course.getCategory(), course.getCreatedBy());
```

```
        return ResponseEntity.ok("Course added successfully!");
    }

    // Add other endpoints (delete, update) if necessary
    @DeleteMapping("/{id}")
    public ResponseEntity<String> deleteCourse(@PathVariable int id) {
        boolean isDeleted = courseService.deleteCourse(id);
        if (isDeleted) {
            return ResponseEntity.ok("Course deleted successfully!");
        } else {
            return ResponseEntity.status(404).body("Course not found!");
        }
    }

    @PutMapping("/{id}/duration")
    public ResponseEntity<String> updateCourseDuration(@PathVariable int id,
@RequestBody int newDuration) {
        boolean isUpdated = courseService.updateCourseDuration(id, newDuration);
        if (isUpdated) {
            return ResponseEntity.ok("Course duration updated successfully!");
        } else {
            return ResponseEntity.status(404).body("Course not found!");
        }
    }
}
```

EmployeeController.java

```
package com.example.demo.controller;

import com.example.demo.model.Employee;
import com.example.demo.service.EmployeeService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
import org.springframework.http.ResponseEntity;

import java.util.List;
import java.util.Map;
import java.util.Optional;

@CrossOrigin(origins = "http://localhost:3000")
@RestController
@RequestMapping("/api/employees")
public class EmployeeController {

    @Autowired
    private EmployeeService employeeService;

    @GetMapping
    public List<Employee> getAllEmployees() {
        return employeeService.getAllEmployees();
    }

    @GetMapping("/{id}")
    public Optional<Employee> getEmployeeById(@PathVariable int id) {
        return employeeService.getEmployeeById(id);
    }
    // Signup Endpoint
    @PostMapping("/signup")
    public ResponseEntity<?> signupEmployee(@RequestBody Employee employee) {
```

```
        // Check if employee already exists
        if (employeeService.findByEmail(employee.getEmail()).isPresent()) {
            return ResponseEntity.badRequest().body("Email already registered.");
        }

        // Save the new employee record
        Employee savedEmployee = employeeService.addEmployee(employee);
        return ResponseEntity.ok(Map.of("success", true, "message", "Employee account
created", "employee", savedEmployee));
    }

    @PostMapping("/login")
    public ResponseEntity<?> loginEmployee(@RequestBody Map<String, String> loginData) {
        String email = loginData.get("email");
        String password = loginData.get("password");

        Optional<Employee> employee = employeeService.findByEmail(email);
        if (employee.isPresent() && employee.get().getPassword().equals(password)) {
            return ResponseEntity.ok(Map.of("success", true, "message", "Login
successful"));
        } else {
            return ResponseEntity.badRequest().body(Map.of("success", false, "message",
"Invalid email or password"));
        }
    }

   // @DeleteMapping("/{id}")
   // public void deleteEmployee(@PathVariable Long id) {
   //     employeeService.deleteEmployee(id);
   // }
}
```

EnrollmentController.java

```
package com.example.demo.controller;

import com.example.demo.dto.EnrollmentRequest;
import com.example.demo.model.Course;
import com.example.demo.model.Employee;
import com.example.demo.model.Enrollment;
import com.example.demo.repository.CourseRepository;
import com.example.demo.repository.EmployeeRepository;
import com.example.demo.repository.EnrollmentRepository;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.*;

import java.time.LocalDate;
import java.util.Optional;

@RestController
@RequestMapping("/api/enrollments")
@CrossOrigin(origins = "http://localhost:3000")
public class EnrollmentController {

    @Autowired
    private EnrollmentRepository enrollmentRepository;

    @Autowired
    private EmployeeRepository employeeRepository;
```

```
    @Autowired
    private CourseRepository courseRepository;

    @PostMapping
    public ResponseEntity<String> enrollEmployee(@RequestBody EnrollmentRequest
enrollmentRequest) {
        try {
            // Check if employee exists
            Optional<Employee> employee =
employeeRepository.findById(enrollmentRequest.getEmployeeId());
            if (employee.isEmpty()) {
                return ResponseEntity.status(404).body("Employee not found with ID: " +
enrollmentRequest.getEmployeeId());
            }

            // Check if course exists
            Optional<Course> course =
courseRepository.findById(enrollmentRequest.getCourseId());
            if (course.isEmpty()) {
                return ResponseEntity.status(404).body("Course not found with ID: " +
enrollmentRequest.getCourseId());
            }

            // Create and save the enrollment record
            Enrollment enrollment = new Enrollment();
            enrollment.setEmployee(employee.get());
            enrollment.setCourse(course.get());

enrollment.setEnrollmentDate(LocalDate.parse(enrollmentRequest.getEnrollmentDate()));
            enrollment.setStatus(enrollmentRequest.getStatus());

            enrollmentRepository.save(enrollment);

            return ResponseEntity.status(201).body("Enrollment successful for employee
ID " + employee.get().getEmployeeId() +
                    " in course ID " + course.get().getCourseId());

        } catch (Exception e) {
            return ResponseEntity.status(500).body("Error enrolling in course: " +
e.getMessage());
        }
    }
}
```

Package repository:

CourseRepository.java

```
package com.example.demo.repository;

import com.example.demo.model.Course;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

@Repository
public interface CourseRepository extends JpaRepository<Course, Integer> {
}
```

EnrollmentRepository.java

```
package com.example.demo.repository;

import com.example.demo.model.Enrollment;
import org.springframework.data.jpa.repository.JpaRepository;

public interface EnrollmentRepository extends JpaRepository<Enrollment, Long> {
    // You can add custom queries here if needed
}
```

EmployeeRepository.java

```
package com.example.demo.repository;

import com.example.demo.model.Employee;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;
import java.util.Optional;

@Repository
public interface EmployeeRepository extends JpaRepository<Employee, Integer> {
    // Additional query methods can be added here if needed
    Optional<Employee> findByEmail(String email);
}
```

Package Service:

CourseService.java

```
package com.example.demo.service;

import com.example.demo.model.Course;
import com.example.demo.repository.CourseRepository;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import java.util.List;
import java.util.Optional;

@Service
public class CourseService {

    @Autowired
    private CourseRepository courseRepository;

    // Method to add a new course
    public void addCourse(String courseName, String courseDescription, int duration,
String category, String createdBy) {
        Course course = new Course(courseName, courseDescription, duration, category,
createdBy);
        courseRepository.save(course); // Save the course to the database
    }
```

```
    // Method to get all courses
    public List<Course> getAllCourses() {
        return courseRepository.findAll(); // Fetch all courses
    }

    // Method to get a course by ID
    public Course getCourseById(int courseId) {
        return courseRepository.findById(courseId).orElse(null);
    }

    public boolean deleteCourse(int courseId) {
        if (courseRepository.existsById(courseId)) {
            courseRepository.deleteById(courseId);
            return true;
        }
        return false;
    }

    public boolean updateCourseDuration(int courseId, int newDuration) {
        Optional<Course> courseOptional = courseRepository.findById(courseId);
        if (courseOptional.isPresent()) {
            Course course = courseOptional.get();
            course.setDuration(newDuration); // Update the duration
            courseRepository.save(course);   // Save the updated course back to the
database
            return true;
        } else {
            return false; // Course not found
        }
    }
}
```

EmployeeService.java

```
package com.example.demo.service;

import com.example.demo.model.Employee;
import com.example.demo.repository.EmployeeRepository;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import java.util.List;
import java.util.Optional;

@Service
public class EmployeeService {

    @Autowired
    private EmployeeRepository employeeRepository;

    public List<Employee> getAllEmployees() {
        return employeeRepository.findAll();
    }

    public Optional<Employee> getEmployeeById(int id) {
        return employeeRepository.findById(id);
    }

    //public void deleteEmployee(Long id) {
        //employeeRepository.deleteById(id);
   // }

    public Optional<Employee> findByEmail(String email) {
```

```
        return employeeRepository.findByEmail(email);
    }

    public Employee addEmployee(Employee employee) {
        return employeeRepository.save(employee); // This will insert a new employee if
it doesn't exist
    }
}
```

EnrollmentService.java

```
package com.example.demo.service;

import com.example.demo.model.Enrollment;
import com.example.demo.model.Employee;
import com.example.demo.model.Course;
import com.example.demo.repository.EnrollmentRepository;
import com.example.demo.repository.EmployeeRepository;
import com.example.demo.repository.CourseRepository;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import java.time.LocalDate;
import java.util.Optional;

@Service
public class EnrollmentService {

    @Autowired
    private EnrollmentRepository enrollmentRepository;

    @Autowired
    private EmployeeRepository employeeRepository;

    @Autowired
    private CourseRepository courseRepository;

    public Enrollment enrollEmployee(int employeeId, int courseId) {
        // Check if employee exists
        Optional<Employee> employee = employeeRepository.findById(employeeId);
        if (employee.isEmpty()) {
            throw new RuntimeException("Employee not found");
        }

        // Check if course exists
        Optional<Course> course = courseRepository.findById(courseId);
        if (course.isEmpty()) {
            throw new RuntimeException("Course not found");
        }

        // Create a new enrollment
        Enrollment enrollment = new Enrollment();
        enrollment.setEmployee(employee.get());
        enrollment.setCourse(course.get());
        enrollment.setEnrollmentDate(LocalDate.now());
        enrollment.setStatus("Ongoing");

        // Save the enrollment
        return enrollmentRepository.save(enrollment);
    }
}
```

Application.properties:

```
spring.application.name=demo
server.port=8080
# MySQL Database Configuration
spring.datasource.url=jdbc:mysql://localhost:3306/project
spring.datasource.username=root
spring.datasource.password=@Arunprakash240703
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver

# JPA Configuration
spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect
```

FRONT-END:

COMPONENTS:

AddCourse.js

```
import React, { useState } from 'react';
import axios from 'axios';
import { Form, Button, Container, Alert } from 'react-
bootstrap';

const AddCourse = () => {
  const [courseData, setCourseData] = useState({
    courseName: '',
    courseDescription: '',
    duration: '',
    category: '',
    createdBy: ''
  });
  const [success, setSuccess] = useState('');
  const [error, setError] = useState('');

  const handleChange = (e) => {
    const { name, value } = e.target;
    setCourseData({ ...courseData, [name]: value });
  };
```

```
  const handleSubmit = async (e) => {
    e.preventDefault();
    try {
      await axios.post('http://localhost:8080/api/courses', {
        ...courseData
      });
      setSuccess('Course added successfully!');
      setError('');
      setCourseData({ courseName: '', courseDescription: '',
duration: '', category: '', createdBy: '' });
    } catch (err) {
      setError('An error occurred while adding the course.');
      setSuccess('');
    }
  };

  return (
    <Container className="mt-5">
      <h2>Add New Course</h2>

      {error && <Alert variant="danger">{error}</Alert>}
      {success && <Alert variant="success">{success}</Alert>}

      <Form onSubmit={handleSubmit}>
        <Form.Group controlId="formCourseName">
          <Form.Label>Course Name</Form.Label>
          <Form.Control
            type="text"
            name="courseName"
            value={courseData.courseName}
            onChange={handleChange}
            required
          />
        </Form.Group>
```

```
        <Form.Group controlId="formCourseDescription"
classNamе="mt-3">
          <Form.Label>Course Description</Form.Label>
          <Form.Control
            as="textarea"
            name="courseDescription"
            value={courseData.courseDescription}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formDuration" className="mt-3">
          <Form.Label>Duration (in hours)</Form.Label>
          <Form.Control
            type="number"
            name="duration"
            value={courseData.duration}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formCategory" className="mt-3">
          <Form.Label>Category</Form.Label>
          <Form.Control
            type="text"
            name="category"
            value={courseData.category}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formCreatedBy" className="mt-3">
          <Form.Label>Instructor</Form.Label>
```

```
          <Form.Control
            type="text"
            name="createdBy"
            value={courseData.createdBy}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Button variant="primary" type="submit" className="mt-
4">
          Add Course
        </Button>
      </Form>
    </Container>
  );
};

export default AddCourse;
```

CoursePage.js

```
import React, { useState, useEffect } from 'react';
import axios from 'axios';
import { Container, Row, Col, Card, Alert, Button } from 'react-
bootstrap';
import { useNavigate } from 'react-router-dom';

const CoursePage = () => {
  const [courses, setCourses] = useState([]);
  const [error, setError] = useState('');
  const [success, setSuccess] = useState('');
  const navigate = useNavigate();

  // Fetch all courses when the component mounts
```

```
  const fetchCourses = async () => {
    try {
      const response = await
axios.get('http://localhost:8080/api/courses');
      setCourses(response.data);
    } catch (err) {
      console.error('Error fetching courses:', err);
      setError('Error fetching courses.');
    }
  };

  useEffect(() => {
    fetchCourses();
  }, []);

  // Delete a course
  const deleteCourse = async (id) => {
    try {
      await
axios.delete(`http://localhost:8080/api/courses/${id}`);
      setSuccess('Course deleted successfully!');
      setCourses(courses.filter(course => course.courseId !==
id));
    } catch (err) {
      console.error('Error deleting course:', err);
      setError('An error occurred while deleting the course.');
    }
  };

  // Navigate to Enrollment page with courseId
  const handleEnroll = (courseId) => {
    navigate(`/enroll/${courseId}`);
  };

  return (
    <Container className="mt-5">
```

```
      <h2>Available Courses</h2>

      {error && <Alert variant="danger">{error}</Alert>}
      {success && <Alert variant="success">{success}</Alert>}

      <Row>
        {courses.length > 0 ? (
          courses.map(course => (
            <Col md={4} key={course.courseId} className="mb-4">
              <Card>
                <Card.Body>
                  <Card.Title>{course.courseName}</Card.Title>
                  <Card.Subtitle className="mb-2 text-
muted">{course.category}</Card.Subtitle>
                  <Card.Text>{course.courseDescription}</Card.Te
xt>
                  <Card.Text><strong>Duration:</strong>
{course.duration} hours</Card.Text>
                  <Card.Text><strong>Instructor:</strong>
{course.createdBy}</Card.Text>
                  <Button variant="danger" onClick={() =>
deleteCourse(course.courseId)}>Delete</Button>
                  <Button variant="primary" onClick={() =>
handleEnroll(course.courseId)} className="ms-2">
                    Enroll
                  </Button>
                </Card.Body>
              </Card>
            </Col>
          ))
        ) : (
          <p>No courses available at the moment.</p>
        )}
      </Row>
    </Container>
  );
```

```
};

export default CoursePage;
```

Enrollment.js

```
import React, { useState } from 'react';
import axios from 'axios';
import { useParams } from 'react-router-dom';
import { Container, Form, Button, Alert } from 'react-
bootstrap';

const Enrollment = () => {
  const { courseId } = useParams(); // Get courseId from URL
  const [employeeId, setEmployeeId] = useState('');
  const [success, setSuccess] = useState('');
  const [error, setError] = useState('');

  const handleEnroll = async (e) => {
    e.preventDefault();
    try {
        const enrollmentData = {
            employeeId: employeeId,    // This matches the DTO
field name
            courseId: courseId,        // This matches the DTO
field name
            enrollmentDate: new
Date().toISOString().split('T')[0], // Date in YYYY-MM-DD format
            status: 'Ongoing'          // Status is directly set
          };

      const response = await
axios.post('http://localhost:8080/api/enrollments',
enrollmentData, {
        headers: {
```

```
          'Content-Type': 'application/json'
        }
      });

      if (response.status === 200 || response.status === 201) {
        setSuccess('Enrollment successful!');
        setError('');
      } else {
        setError('Enrollment failed: Unexpected server
response');
        setSuccess('');
      }
    } catch (err) {
      console.error('Error during enrollment:', err);
      // Check if err.response exists for a more specific error
message
      const errorMessage = err.response?.data?.message ||
err.message;
      setError(`Failed to enroll in the course:
${errorMessage}`);
      setSuccess('');
    }
  };

  return (
    <Container className="mt-5">
      <h2>Enroll in Course</h2>
      {error && <Alert variant="danger">{error}</Alert>}
      {success && <Alert variant="success">{success}</Alert>}
      <Form onSubmit={handleEnroll}>
        <Form.Group controlId="formEmployeeId">
          <Form.Label>Employee ID</Form.Label>
          <Form.Control
            type="text"
            value={employeeId}
            onChange={(e) => setEmployeeId(e.target.value)}
```

```
            required
          />
        </Form.Group>

        <Form.Group controlId="formStatus" className="mt-3">
          <Form.Label>Status</Form.Label>
          <Form.Control
            type="text"
            value="Ongoing"
            readOnly
          />
        </Form.Group>

        <Button variant="primary" type="submit" className="mt-
4">
          Enroll
        </Button>
      </Form>
    </Container>
  );
};

export default Enrollment;
```

HomePage.js

```
// HomePage.js
import React from 'react';
import { useNavigate } from 'react-router-dom';
import { Container, Button, Row, Col } from 'react-bootstrap';

const HomePage = () => {
  const navigate = useNavigate();
```

```
  return (
    <Container className="d-flex justify-content-center align-
items-center" style={{ height: '100vh' }}>
      <Row>
        <Col className="text-center">
          <h1>Welcome to Our Account Creation Platform</h1>
          <p>Please log in or sign up to access our courses.</p>
          <Button variant="primary" onClick={() =>
navigate('/login')} className="m-2">
            Login
          </Button>
          <Button variant="success" onClick={() =>
navigate('/signup')} className="m-2">
            Signup
          </Button>
        </Col>
      </Row>
    </Container>
  );
};

export default HomePage;
```

Login.js

```
import React, { useState } from 'react';
import axios from 'axios';
import { Form, Button, Container, Alert } from 'react-
bootstrap';
import { useNavigate } from 'react-router-dom'

const Login = () => {
  const [formData, setFormData] = useState({
    email: '',
    password: ''
```

```
  });

  const [success, setSuccess] = useState(null);
  const [error, setError] = useState(null);

  const handleChange = (e) => {
    const { name, value } = e.target;
    setFormData({ ...formData, [name]: value });
  };
  const navigate = useNavigate();

  const handleSubmit = async (e) => {
    e.preventDefault();
    try {
      const response = await
axios.post('http://localhost:8080/api/employees/login',
formData);
      if (response.data.success) {
        setSuccess('Login successful!');
        setError(null);
        navigate('/courses'); // Redirect to CoursePage.js after
successful login
      } else {
        setError(response.data.message || 'Invalid login
credentials');
        setSuccess(null);
      }
    } catch (error) {
      setError('Invalid password or email');
      setSuccess(null);
    }
  };

  return (
    <Container className="mt-5">
      <h2 className="text-center mb-4">Employee Login</h2>
```

```
      {error && <Alert variant="danger">{error}</Alert>}
      {success && <Alert variant="success">{success}</Alert>}
      <Form onSubmit={handleSubmit}>
        <Form.Group controlId="formEmail">
          <Form.Label>Email</Form.Label>
          <Form.Control
            type="email"
            name="email"
            value={formData.email}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formPassword" className="mt-3">
          <Form.Label>Password</Form.Label>
          <Form.Control
            type="password"
            name="password"
            value={formData.password}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Button variant="primary" type="submit" className="mt-
4">
          Log In
        </Button>
      </Form>
    </Container>
  );
};

export default Login;
```

Login.js

```
import React from 'react';
import { Navbar, Nav, Container } from 'react-bootstrap';
import { NavLink } from 'react-router-dom';

const NavBarComp = () => {
  return (
    <Navbar bg="light" expand="lg">
      <Container>
        <Navbar.Brand as={NavLink} to="/">MyApp</Navbar.Brand>
        <Navbar.Toggle aria-controls="basic-navbar-nav" />
        <Navbar.Collapse id="basic-navbar-nav">
          <Nav className="me-auto">
            <Nav.Link as={NavLink} to="/" exact>Home</Nav.Link>
            <Nav.Link as={NavLink} to="/login">Login</Nav.Link>
            <Nav.Link as={NavLink}
to="/signup">SignUp</Nav.Link>
            <Nav.Link as={NavLink}
to="/courses">Courses</Nav.Link>
            <Nav.Link as={NavLink} to="/add-course">Add
Course</Nav.Link>
          </Nav>
        </Navbar.Collapse>
      </Container>
    </Navbar>
  );
};

export default NavBarComp;
```

SignUp.js

```
import React, { useState } from 'react';
import axios from 'axios';
```

```
import { Form, Button, Container, Alert } from 'react-
bootstrap';

const Signup = () => {
  const [formData, setFormData] = useState({
    firstName: '',
    lastName: '',
    email: '',
    department: '',
    position: '',
    dateOfJoining: '',
    educationLevel: '',
    password: ''
  });

  const [success, setSuccess] = useState(null);
  const [error, setError] = useState(null);

  const handleChange = (e) => {
    const { name, value } = e.target;
    setFormData({ ...formData, [name]: value });
  };

  const handleSubmit = async (e) => {
    e.preventDefault();
    try {
      const response = await
axios.post('http://localhost:8080/api/employees/signup',
formData);
      if (response.data.success) {
        setSuccess('Account created successfully!');
        setError(null);
      } else {
        setError('Error creating account');
        setSuccess(null);
      }
```

```
    } catch (error) {
      setError('An error occurred. Please try again.');
      setSuccess(null);
    }
  };

  return (
    <Container className="mt-5">
      <h2 className="text-center mb-4">Employee Signup</h2>
      {error && <Alert variant="danger">{error}</Alert>}
      {success && <Alert variant="success">{success}</Alert>}
      <Form onSubmit={handleSubmit}>
        <Form.Group controlId="formFirstName">
          <Form.Label>First Name</Form.Label>
          <Form.Control
            type="text"
            name="firstName"
            value={formData.firstName}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formLastName" className="mt-3">
          <Form.Label>Last Name</Form.Label>
          <Form.Control
            type="text"
            name="lastName"
            value={formData.lastName}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formEmail" className="mt-3">
          <Form.Label>Email</Form.Label>
```

```
          <Form.Control
            type="email"
            name="email"
            value={formData.email}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formDepartment" className="mt-3">
          <Form.Label>Department</Form.Label>
          <Form.Control
            type="text"
            name="department"
            value={formData.department}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formPosition" className="mt-3">
          <Form.Label>Position</Form.Label>
          <Form.Control
            type="text"
            name="position"
            value={formData.position}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formDateOfJoining" className="mt-
3">
          <Form.Label>Date of Joining</Form.Label>
          <Form.Control
            type="date"
```

```
            name="dateOfJoining"
            value={formData.dateOfJoining}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formEducationLevel"
className="mt-3">
          <Form.Label>Education Level</Form.Label>
          <Form.Control
            type="text"
            name="educationLevel"
            value={formData.educationLevel}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Form.Group controlId="formPassword" className="mt-3">
          <Form.Label>Password</Form.Label>
          <Form.Control
            type="password"
            name="password"
            value={formData.password}
            onChange={handleChange}
            required
          />
        </Form.Group>

        <Button variant="primary" type="submit" className="mt-
4">
          Sign Up
        </Button>
      </Form>
    </Container>
```

```
  );
};

export default Signup;
```

App.js

```
import { BrowserRouter as Router, Routes, Route } from 'react-
router-dom';
import NavBarComp from './components/NavBar';
import Home from './components/HomePage';
import Login from './components/Login';
import Signup from './components/SignUp';
import CoursePage from './components/CoursePage';
import AddCourse from './components/AddCourse';
import Enrollment from './components/Enrollement';
import 'bootstrap/dist/css/bootstrap.min.css';

function App() {
  return (
    <Router>
      <NavBarComp />
      <Routes>
        <Route path="/" element={<Home />} />
        <Route path="/login" element={<Login />} />
        <Route path="/signup" element={<Signup />} />
        <Route path="/courses" element={<CoursePage />} />
        <Route path="/add-course" element={<AddCourse />} />
        <Route path="/enroll/:courseId" element={<Enrollment />}
/>
      </Routes>
    </Router>
  );
}
```

```
export default App;
```

MySQL Database:

```
Use project;
CREATE TABLE employees (
employee_id INT PRIMARY KEY AUTO_INCREMENT,
first_name VARCHAR(50) NOT NULL,
last_name VARCHAR(50) NOT NULL,
email VARCHAR(100) NOT NULL UNIQUE,
 department VARCHAR(100),
position VARCHAR(100),
date_of_joining DATE,
 education_level VARCHAR(50)
                                                                    );
select * from employees;
Truncate  table employees;


CREATE TABLE courses (
course_id INT AUTO_INCREMENT PRIMARY KEY,
course_name VARCHAR(255) NOT NULL,
course_description TEXT,
duration INT NOT NULL,
category VARCHAR(100),
created_by VARCHAR(255) NOT NULL
                                                                    );
```

select * from courses;

CREATE TABLE enrollments (

enrollment_id INT AUTO_INCREMENT PRIMARY KEY,

employee_id INT NOT NULL,

course_id INT NOT NULL,

enrollment_date DATE NOT NULL,

status VARCHAR(50) NOT NULL,

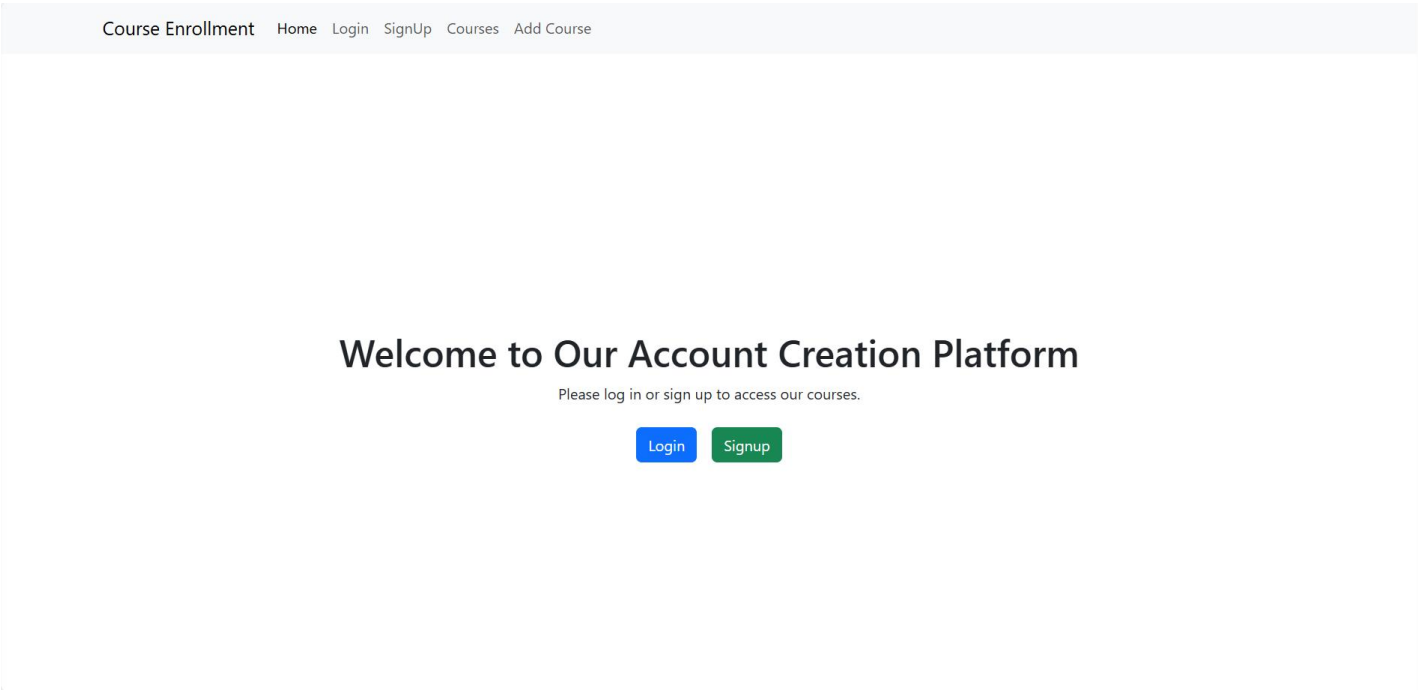
FOREIGN KEY (employee_id) REFERENCES Employees(employee_id),

FOREIGN KEY (course_id) REFERENCES Courses(course_id)

select * from enrollments;

SNAPSHOTS

Home Page



Signup Page

Account created successfully!

First Name

magesh

Last Name

vasan

Email

mageshvasan@gmail.com

Department

Research

Position

Analyst

Date of Joining

22-11-2024

Education Level

Under graduate

Course Enrollment Home Login SignUp Courses Add Course

Login Page

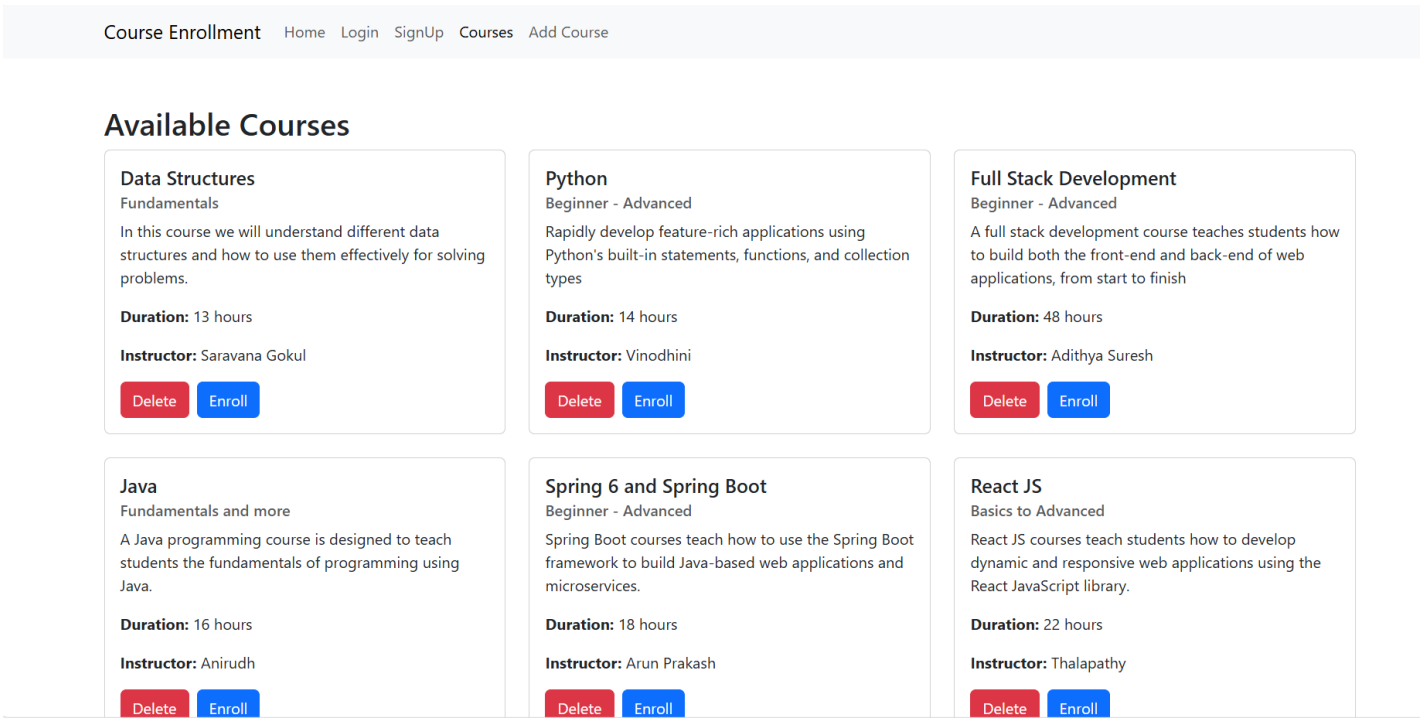
Email

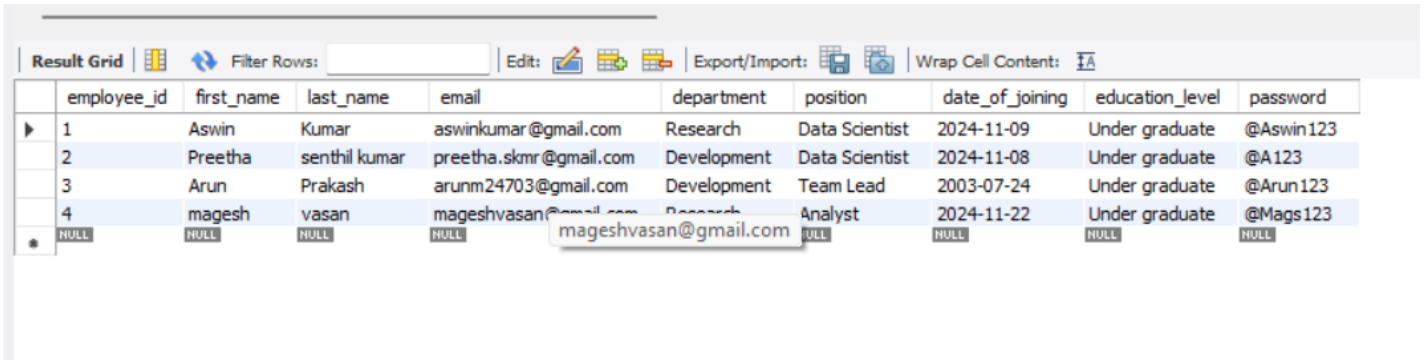
mageshvasan@gmail.com

Password

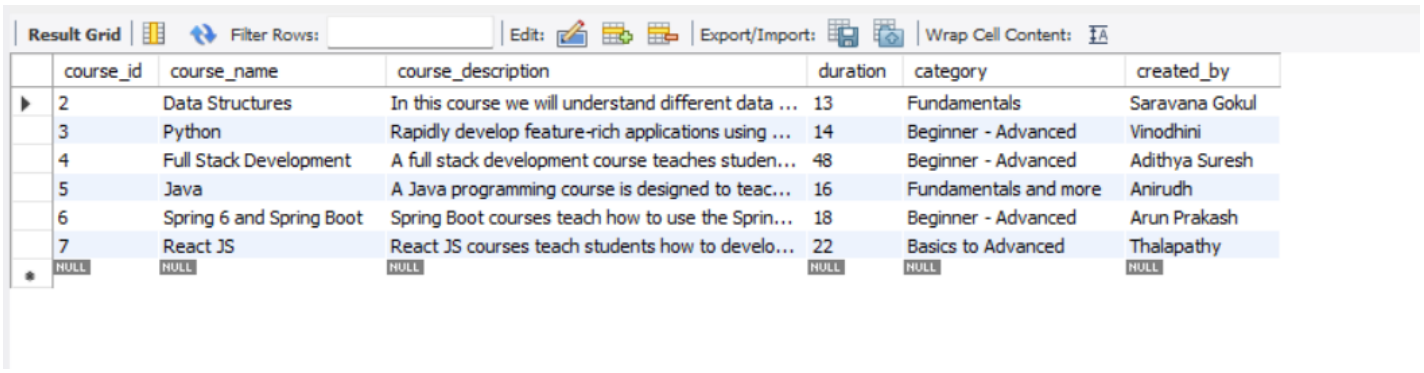
••••••••

Log In





employee_id	first_name	last_name	email	department	position	date_of_joining	education_level	password
1	Aswin	Kumar	aswinkumar@gmail.com	Research	Data Scientist	2024-11-09	Under graduate	@Aswin123
2	Preetha	senthil kumar	preetha.skmr@gmail.com	Development	Data Scientist	2024-11-08	Under graduate	@A123
3	Arun	Prakash	arunm24703@gmail.com	Development	Team Lead	2003-07-24	Under graduate	@Arun123
4	magesh	vasan	mageshvasan@gmail.com	Research	Analyst	2024-11-22	Under graduate	@Mags123
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL



course_id	course_name	course_description	duration	category	created_by
2	Data Structures	In this course we will understand different data ...	13	Fundamentals	Saravana Gokul
3	Python	Rapidly develop feature-rich applications using ...	14	Beginner - Advanced	Vinodhini
4	Full Stack Development	A full stack development course teaches studen...	48	Beginner - Advanced	Adithya Suresh
5	Java	A Java programming course is designed to teac...	16	Fundamentals and more	Anirudh
6	Spring 6 and Spring Boot	Spring Boot courses teach how to use the Sprin...	18	Beginner - Advanced	Arun Prakash
7	React JS	React JS courses teach students how to develo...	22	Basics to Advanced	Thalapathy
NULL	NULL	NULL	NULL	NULL	NULL

RESULTS AND DISCUSSION

The **Course Enrollment Management System** successfully fulfills the requirements for managing courses and enrollments. Key functionalities, such as course creation, deletion, updating course details, and employee enrollment, are implemented and tested. The integration of a user-friendly frontend with React.js and a robust backend using Spring Boot ensures smooth and reliable operations. Data is stored securely in a MySQL database, enabling efficient handling of course and enrollment records. The system also provides real-time error handling, ensuring a seamless user experience.

CONCLUSION

The **Course Enrollment Management System** successfully streamlines the process of managing courses and enrolling employees, providing an efficient and user-friendly solution. By integrating React.js for the frontend, Spring Boot for the backend, and MySQL for data management, the system achieves a seamless flow of operations. It addresses key requirements such as course management, enrollment handling, and data security. While the current implementation meets foundational needs, future enhancements can introduce features like automated notifications, progress tracking, and analytics to further enrich the user experience. This project lays a strong groundwork for modernizing course enrollment and management processes in organizational and educational settings.

REFERENCES

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https://www.javatpoint.com/mysql-tutorial

2. Spring Boot Tutorial:

   https://www.javatpoint.com/spring-boot-tutorial

3. JAVA Tutorial:

   https://www.javatpoint.com/java-tutorial

4. React Tutorial:

   https://legacy.reactjs.org/tutorial/tutorial.html