**Case Study: Online Learning Platform**

**Section 1: Python Standalone Console Application**

Design and implement a standalone console application for an Online Learning Platform using Python. The application should utilize collections, object-oriented programming (OOP), and exception handling to manage courses, students, instructors, and enrollments.

**Requirements:**

1. **Course Management:**

* Implement the functionality to add, update, and delete course records.
* Each course should have attributes such as course\_id, title, description, instructor\_id, and capacity.

1. **Student Management:**

* Implement the functionality to manage students.
* Each student should have attributes such as student\_id, name, email, and address.

1. **Instructor Management:**

* Implement the functionality to manage instructors.
* Each instructor should have attributes such as instructor\_id, name, email, and expertise.

1. **Enrollment Management:**

* Implement the functionality to handle course enrollments.
* Each enrollment should have attributes such as enrollment\_id, student\_id, course\_id, and enrollment\_date.

**Business Functionalities:**

1. **Manage Courses:**
   * Create a class Course with attributes course\_id, title, description, instructor\_id, and capacity.
   * Implement methods to add a new course, update course details, and delete a course from the system.
2. **Manage Students:**
   * Create a class Student with attributes student\_id, name, email, and address.
   * Implement methods to add a new student, update student details, and delete a student.
3. **Manage Instructors:**
   * Create a class Instructor with attributes instructor\_id, name, email, and expertise.
   * Implement methods to add a new instructor, update instructor details, and delete an instructor.
4. **Manage Enrollments:**
   * Create a class Enrollment with attributes enrollment\_id, student\_id, course\_id, and enrollment\_date.
   * Implement methods to enroll a student in a course, update enrollment details, and cancel an enrollment.

**Section 2: MySQL Database Management**

Design a MySQL database schema to support the Online Learning Platform and provide solutions for the problem statements.

**Table Structures:**

1. **Courses Table:**

* course\_id: INT, Primary Key
* title: VARCHAR(255)
* description: TEXT
* instructor\_id: INT, Foreign Key References Instructors(instructor\_id)
* capacity: INT

1. **Students Table:**

* student\_id: INT, Primary Key
* name: VARCHAR(255)
* email: VARCHAR(255)
* address: VARCHAR(255)

1. **Instructors Table:**

* instructor\_id: INT, Primary Key
* name: VARCHAR(255)
* email: VARCHAR(255)
* expertise: TEXT

1. **Enrollments Table:**

* enrollment\_id: INT, Primary Key
* student\_id: INT, Foreign Key References Students(student\_id)
* course\_id: INT, Foreign Key References Courses(course\_id)
* enrollment\_date: DATE

**Problem Statements:**

* Write a query to find the total number of students enrolled in each course.
* Write a query to find the courses with the highest enrollment.
* Write a query to find the instructors who are teaching the most courses.
* Write a query to find the courses a specific student is enrolled in.
* Write a query to find the students enrolled in a specific course.