**EXERCISE 5**

**Question 1: Students and Courses Tables**

**Create two tables, Students and Courses, with the following structures:**

*Table 1: Students*

*Define a table named Students with the following columns:*

* student\_id as the primary key
* student\_name of type VARCHAR2 with a maximum length of 50
* enrollment\_date of type DATE

*Table 2: Courses*

*Define a table named Courses with the following columns:*

* course\_id as the primary key
* course\_name of type VARCHAR2 with a maximum length of 100
* Also, create a foreign key relationship in the Students table that references the course\_id in the Courses table to track the courses each student is enrolled in.

**Question 2: Employees and Departments Tables**

*Create two tables, Employees and Departments, with the following structures:*

*Table 1: Employees*

*Create a table named Employees with the following columns:*

* employee\_id as the primary key
* first\_name of type VARCHAR2 with a maximum length of 50
* last\_name of type VARCHAR2 with a maximum length of 50
* department\_id of type NUMBER

*Table 2: Departments*

*Define a table named Departments with the following columns:*

* department\_id as the primary key
* department\_name of type VARCHAR2 with a maximum length of 100
* Establish a foreign key relationship in the Employees table that references the department\_id in the Departments table to associate each employee with a department.

**Question 3: Orders and Customers Tables**

**Create two tables, Orders and Customers, with the following structures:**

*Table 1: Customers*

*Create a table named Customers with the following columns:*

* customer\_id as the primary key customer\_name of type VARCHAR2 with a maximum length of 100
* email of type VARCHAR2 with a maximum length of 100

*Table 2: Orders*

*Define a table named Orders with the following columns:*

* order\_id as the primary key
* order of type DATE
* total\_amount of type NUMBER with precision 10 and scale 2
* customer\_id of type NUMBER
* Establish a foreign key relationship in the Orders table that references the customer\_id in the Customers table to associate each order with a customer.

**Question 4: Authors and Books Tables**

**Create two tables, Authors and Books, with the following structures:**

*Table 1: Authors*

*Create a table named Authors with the following columns:*

* author\_id as the primary key
* author\_name of type VARCHAR2 with a maximum length of 100
* nationality of type VARCHAR2 with a maximum length of 50

*Table 2: Books*

*Define a table named Books with the following columns:*

* book\_id as the primary key
* title of type VARCHAR2 with a maximum length of 200
* author\_id of type NUMBER
* Establish a foreign key relationship in the Books table that references the author\_id in the Authors table to link each book to an author.

**Students Table Insert Questions:**

* Insert a new student with a student\_id of 101, a student\_name of 'John Smith', and an enrollment\_date of '2022-09-15'.
* Add a student with a student\_id of 102, a student\_name of 'Mary Johnson', and an enrollment\_date of '2022-08-20'.
* Insert a student with a student\_id of 103, a student\_name of 'David Wilson', and an enrollment\_date of '2022-10-10'.
* Add a new student with a student\_id of 104, a student\_name of 'Jessica Brown', and an enrollment\_date of '2022-07-05'.
* Insert a student with a student\_id of 105, a student\_name of 'Emily Davis', and an enrollment\_date of '2022-11-30'.
* Add a student with a student\_id of 106, a student\_name of 'Daniel Miller', and an enrollment\_date of '2022-06-12'.
* Insert a new student with a student\_id of 107, a student\_name of 'Olivia Harris', and an enrollment\_date of '2022-12-25'.
* Add a student with a student\_id of 108, a student\_name of 'Liam Martinez', and an enrollment\_date of '2022-05-08'.
* Insert a student with a student\_id of 109, a student\_name of 'Ava Jones', and an enrollment\_date of '2022-04-18'.
* Add a new student with a student\_id of 110, a student\_name of 'Noah Anderson', and an enrollment\_date of '2022-03-02'.

**Courses Table Insert Questions:**

* Insert a new course with a course\_id of 201 and a course\_name of 'Database Management'.
* Add a course with a course\_id of 202 and a course\_name of 'Web Development'.
* Insert a course with a course\_id of 203 and a course\_name of 'Programming Fundamentals'.
* Add a new course with a course\_id of 204 and a course\_name of 'Data Structures'.
* Insert a course with a course\_id of 205 and a course\_name of 'Software Engineering'.
* Add a course with a course\_id of 206 and a course\_name of 'Network Security'.
* Insert a new course with a course\_id of 207 and a course\_name of 'Artificial Intelligence'.
* Add a course with a course\_id of 208 and a course\_name of 'Mobile App Development'.
* Insert a course with a course\_id of 209 and a course\_name of 'Operating Systems'.
* Add a new course with a course\_id of 210 and a course\_name of 'Computer Graphics'.

**Employees Table Insert Questions:**

* Insert a new employee with an employee\_id of 1001, a first\_name of 'John', a last\_name of 'Smith', a department\_id of 101, and a salary of $60,000.00.
* Add an employee with an employee\_id of 1002, a first\_name of 'Mary', a last\_name of 'Johnson', a department\_id of 102, and a salary of $55,000.00.
* Insert an employee with an employee\_id of 1003, a first\_name of 'David', a last\_name of 'Wilson', a department\_id of 103, and a salary of $62,000.00.
* Add a new employee with an employee\_id of 1004, a first\_name of 'Jessica', a last\_name of 'Brown', a department\_id of 101, and a salary of $58,000.00.
* Insert an employee with an employee\_id of 1005, a first\_name of 'Emily', a last\_name of 'Davis', a department\_id of 102, and a salary of $61,000.00.
* Add an employee with an employee\_id of 1006, a first\_name of 'Daniel', a last\_name of 'Miller', a department\_id of 103, and a salary of $54,000.00.
* Insert a new employee with an employee\_id of 1007, a first\_name of 'Olivia', a last\_name of 'Harris', a department\_id of 101, and a salary of $59,000.00.
* Add an employee with an employee\_id of 1008, a first\_name of 'Liam', a last\_name of 'Martinez', a department\_id of 102, and a salary of $57,000.00.
* Insert an employee with an employee\_id of 1009, a first\_name of 'Ava', a last\_name of 'Jones', a department\_id of 103, and a salary of $63,000.00.
* Add a new employee with an employee\_id of 1010, a first\_name of 'Noah', a last\_name of 'Anderson', a department\_id of 101, and a salary of $56,000.00.

**Departments Table Insert Questions:**

* Insert a new department with a department\_id of 101 and a department\_name of 'Information Technology'.
* Add a department with a department\_id of 102 and a department\_name of 'Human Resources'.
* Insert a department with a department\_id of 103 and a department\_name of 'Marketing'.
* Add a new department with a department\_id of 104 and a department\_name of 'Finance'.
* Insert a department with a department\_id of 105 and a department\_name of 'Operations'.
* Add a department with a department\_id of 106 and a department\_name of 'Research and Development'.
* Insert a new department with a department\_id of 107 and a department\_name of 'Customer Support'.
* Add a department with a department\_id of 108 and a department\_name of 'Sales'.
* Insert a department with a department\_id of 109 and a department\_name of 'Quality Assurance'.
* Add a new department with a department\_id of 110 and a department\_name of 'Legal Affairs'.

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**Students Table Select Queries:**

* Retrieve the names of all students in the Students table.
* Find the students who were enrolled before January 1, 2022.
* List the students whose names start with the letter 'D'.
* Display the count of students in the Students table.
* Find the student with the highest student\_id.
* Retrieve the students with enrollment dates in the year 2022.
* List the students whose names contain the substring 'Brown'.
* Show the student with the lowest student\_id.
* Find the students who were enrolled on or after July 1, 2022.
* Display the students in alphabetical order of their last names.

**Courses Table Select Queries:**

* Retrieve the names of all courses in the Courses table.
* List the courses whose names contain the word 'Development'.
* Display the count of courses in the Courses table.
* Find the courses whose names do not contain the word 'Programming'.
* Show the course with the highest course\_id.
* Retrieve the courses with names longer than 20 characters.
* List the courses whose names start with the letter 'C'.
* Find the course with the lowest course\_id.
* Display the courses in reverse alphabetical order of their names.
* List the courses with names containing the substring 'Engineering'.

**Employees Table Select Queries:**

* Retrieve the names and salaries of all employees in the Employees table.
* List the employees with salaries greater than $55,000.00.
* Display the count of employees in the Employees table.
* Find the employees whose first names start with the letter 'J'.
* Show the employee with the highest salary.
* Retrieve the employees with last names longer than 8 characters.
* List the employees with salaries less than $58,000.00.
* Find the employee with the lowest salary.
* Display the employees in alphabetical order of their first names.
* List the employees hired in the year 2023.

**Departments Table Select Queries:**

* Retrieve the names of all departments in the Departments table.
* List the departments whose names contain the word 'Technology'.
* Display the count of departments in the Departments table.
* Find the departments whose names do not contain the word 'Finance'.
* Show the department with the highest department\_id.
* Retrieve the departments with names longer than 12 characters.
* List the departments whose names start with the letter 'H'.
* Find the department with the lowest department\_id.
* Display the departments in reverse alphabetical order of their names.
* List the departments with names containing the substring 'Research'.