### **Assignment No.7**

Name :- Shailesh Pawar

PRN:-123B1B230

Solve following SQL Queries:

1. Find students who have a CGPA higher than the university average CGPA

### Code:-

select StudentID, Name, CGPA from Students\_230

where CGPA > (select avg(CGPA) from Students 230);

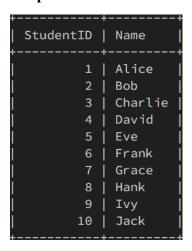
# Output:-

+   StudentID +		 Name 		CGPA	-+    -+
1   2   5   7   9		Alice Bob Eve Grace Ivy	į	9.20 8.50 9.10 8.70 9.00	

2. Find students who have never enrolled in any course

#### Code :-

select DISTINCT s.StudentID,s.Name from Students\_230 as s
left outer Join Enrollments\_230 as e
on s.StudentID = e.StudentID;



3. Get courses that have no students enrolled

#### Code :-

select CourseID, CourseName from Courses 230

where CourseID not in (select distinct CourseID from Enrollments 230);

### **Output:-**

```
OK, 0 records retrieved in 0.746ms
```

4. Get students enrolled in courses offered by the 'Computer Sci' department

### Code :-

select distinct s.StudentID,s.Name,s.DepartmentID from Students 230 as s

Join Enrollments 230 as e

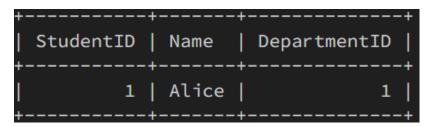
on s.StudentID = e.StudentID

Join Departments 230 as d

on s.DepartmentID = d.DepartmentID

where d.DeptName = 'Computer Sci';

#### **Output:-**

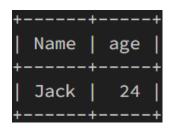


5. Find students who have the same age as the oldest student

#### Code:-

select Name,age from Students\_230

where age = (select max(age) from Students 230);



6. Retrieve courses where at least one student scored more than 85 marks

#### Code:-

SELECT DISTINCT c.\*

FROM courses 230 c

JOIN enrollments\_230 e ON c.CourseID = e.CourseID

WHERE e.Marks > 85;

# **Output:-**

+   CourseID +	CourseName	DepartmentID
CSE101	Data Structures	1
ECE201	Digital Circuits	2
BI0501	Genetics	5
BUS901	Marketing	9
MATH701	Linear Algebra	7

7. Find the highest CGPA in each department

### Code:-

SELECT d.DepartmentID, d.DeptName, MAX(s.CGPA) AS Highest\_CGPA

FROM students\_230 s

JOIN departments\_230 d ON s.DepartmentID = d.DepartmentID

GROUP BY d.DepartmentID, d.DeptName;

+   DepartmentID +	+	DeptName	++   Highest_CGPA   ++
1   2   3   4   5   6   7   8	<del>-</del>	Computer Sci Electrical Eng Mechanical Eng Civil Eng Biotechnology Physics Mathematics Chemistry Business Psychology	9.20   8.50   7.80   6.90   9.10   5.60   8.70   7.50   9.00
+	-+		++

8. Get students who have enrolled in more than one course

#### Code:-

SELECT s.\*FROM students\_230 s

JOIN enrollments\_230 e ON s.StudentID = e.StudentID

GROUP BY s.StudentID

HAVING COUNT(DISTINCT e.CourseID) > 1;

# Output :-

<b>.</b>				<b>_</b>
StudentID	Name	Age	DepartmentID	CGPA
1   2	Alice   Bob	20     22	1 2	9.20     8.50
3	Charlie	21	3	7.80
4	David	23	4	6.90
5	Eve	19	5	9.10
6	Frank	20	6	5.60
7	Grace	22	7	8.70
8	Hank	21	8	7.50
9	Ivy	23	9	9.00
10 +	Jack -+	24   ++	10 	6.80   ++

9. Get the department with the most students enrolled

### Code:-

SELECT d.\*

FROM departments\_230 d

JOIN students\_230 s ON d.DepartmentID = s.DepartmentID

GROUP BY d.DepartmentID

ORDER BY COUNT(s.StudentID) DESC

```
LIMIT 1;
```

### **Output:-**

```
+-----+
| DepartmentID | DeptName | HOD |
+------
| 1 | Computer Sci | Dr. Smith |
```

10. Find students who are not enrolled in any course

```
Code:-
SELECT *
FROM students_230 s
WHERE NOT EXISTS (
SELECT 1 FROM enrollments_230 e
WHERE s.StudentID = e.StudentID
);
```

# Output:-

```
OK, 0 records retrieved in 0.779ms
```

11. Retrieve students who scored below the average marks in their courses

```
Code :-
```

```
SELECT s.*

FROM students_230 s

JOIN enrollments_230 e ON s.StudentID = e.StudentID

WHERE e.Marks < (

SELECT AVG(Marks) FROM enrollments_230 e2

WHERE e.CourseID = e2.CourseID

);
```

StudentID	-+-	Name		Age	DepartmentID		CGPA
2	-+·	Bob		22	+   2	1	+ 8.50
5	Ť	Eve	Ĺ	19	5	İ	9.10
5	Ť	Eve	Ĺ	19	5	Ť	9.10
6	Ť	Frank	Ĺ	20	6	Ť	5.60
6	Т	Frank	Τ	20	6	Τ	5.60
7	Т	Grace	Т	22	7	1	8.70
7	1	Grace	Τ	22	7	1	8.70
8	Т	Hank	Т	21	8	1	7.50
9	Т	Ivy	Т	23	9	1	9.00
10		Jack	Ī	24	10	Ī	6.80
+	-+-		+-		+	+	+

12. Find the department where the highest CGPA student belongs

### Code :-

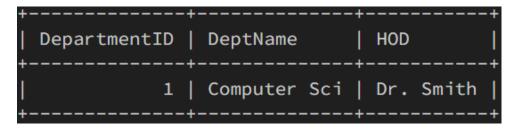
SELECT d.\*

FROM departments\_230 d

JOIN students 230 s ON d.DepartmentID = s.DepartmentID

WHERE s.CGPA = (SELECT MAX(CGPA) FROM students\_230);

### **Output:-**



13. Find the department with the highest number of students enrolled

#### Code:-

SELECT d.\*

FROM departments\_230 d

JOIN students 230 s ON d.DepartmentID = s.DepartmentID

GROUP BY d.DepartmentID

ORDER BY COUNT(s.StudentID) DESC

LIMIT 1;

# **Output:-**

```
| DepartmentID | DeptName | HOD | HO
```

14. Get courses where the lowest score is higher than 70

```
Code:-
```

```
SELECT c.*
```

FROM courses\_230 c

```
WHERE 70 < ALL (
```

SELECT Marks FROM enrollments 230 e

WHERE e.CourseID = c.CourseID

);

# Output :-

+   CourseID   +	CourseName	++   DepartmentID   +
BI0501     BUS901     CSE101	Genetics Marketing Data Structures	5     9     1
MATH701	Linear Algebra	7   +

15. Retrieve students who have the same CGPA as 'Alice'

### Code:-

SELECT \*

FROM students 230

WHERE CGPA = (SELECT CGPA FROM students 230 WHERE Name = 'Alice');

StudentID	Name	   Age	DepartmentID	
	Alice			9.20

16. Get the course where the maximum number of students have enrolled

#### Code:-

SELECT c.\*

FROM courses 230 c

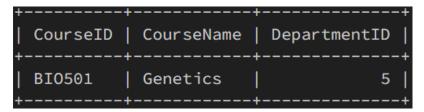
JOIN enrollments 230 e ON c.CourseID = e.CourseID

GROUP BY c.CourseID

ORDER BY COUNT(e.StudentID) DESC

LIMIT 1;

### **Output:-**



17. Find students who are enrolled in more than two courses

#### Code:-

SELECT s.\*

FROM students 230 s

JOIN enrollments 230 e ON s.StudentID = e.StudentID

GROUP BY s.StudentID

HAVING COUNT(DISTINCT e.CourseID) > 2;

#### **Output:-**

```
OK, 0 records retrieved in 0.774ms
```

18. Retrieve students who have scored the highest marks in any course(Hint: Use Join along with nested quesries).

```
Code:-
SELECT s.*

FROM students_230 s

JOIN enrollments_230 e ON s.StudentID = e.StudentID

WHERE e.Marks = (
SELECT MAX(Marks)

FROM enrollments_230 e2

WHERE e.CourseID = e2.CourseID

);
```

# Output :-

+   StudentID	+   Name	+   Age	+   DepartmentID	++   CGPA
+	+	+	+	++
1	Alice	20	1	9.20
1	Alice	20	1	9.20
2	Bob	22	2	8.50
3	Charlie	21	3	7.80
3	Charlie	21	3	7.80
4	David	23	4	6.90
4	David	23	4	6.90
8	Hank	21	8	7.50
9	Ivy	23	9	9.00
10	Jack	24	10	6.80
+	+	+	+	++

19. Get the department with the lowest average CGPA

# Code:-

SELECT d.\*

FROM departments\_230 d

JOIN students\_230 s ON d.DepartmentID = s.DepartmentID

GROUP BY d.DepartmentID

ORDER BY AVG(s.CGPA) ASC

LIMIT 1;

20. Find the course in which the maximum number of students have failed (Marks < 40)

# Code:-

SELECT c.\*

FROM courses 230 c

JOIN enrollments\_230 e ON c.CourseID = e.CourseID

WHERE e.Marks < 40

GROUP BY c.CourseID

ORDER BY COUNT(e.StudentID) DESC

LIMIT 1;

CourseID	CourseName	DepartmentID
CIV401   	Structural Analysis	   4   +