Exercise 2 : SQL Aggregate Functions & SQL Operators

Table : students

Student Id	Name	Age	department
1	Alice	20	IT
2	Bob	22	HR
3	Charlie	21	IT
4	Diana	23	Finance
5	Eve	22	HR

① SELECT DISTINCT department
FROM students; ✓

department
IT
HR
Finance

✓

2 SELECT department,
AVG (age) AS avg_age
FROM students
GROUP BY department; ✓

department	avg_age
IT	20.5
HR	22
Finance	23

✓

3 SELECT department,
Count (student_id) AS student_count
FROM students
GROUP BY department
HAVING student_count > 1;

department	student_count
IT	2
HR	2

4. SELECT student_id,
name,
age,
department ✓
FROM student
WHERE age BETWEEN 21 and 23

student_id	name	age	department
2	Bob	22	HR
3	Charlie	21	IT
4	Diana	23	Finance
5	Eve	22	HR

5 SELECT student_id,
name,
age,
department
FROM students
WHERE department IN ('IT', 'HR') AND age > 21

student_id	name	age	department
1	Alice	20	IT
2	Bob	22	HR
3	Charlie	21	IT
5	Eve	22	HR

6. Table: Courses

Course_id	course_name	department	credits
101	SQL Basics	IT	3
102	Python	IT	4
103	Data Science	IT	4
104	Excel	Finance	2
105	Statistics	HR	3

6. SELECT department,
SUM (credits) AS total_credits
FROM COURSES
GROUP BY department

HAVING total_credits > 5 ; ✓

department	total_credits
IT	11

✓

7. SELECT *
FROM courses
WHERE credits ≠ 4 ; ✓

course_id	course_name	department	credits
101	SQL Basics	IT	3
104	Excel	Finance	2
105	Statistics	HR	3

✓

8. SELECT course_id, course_name, credits
FROM courses
ORDER BY credits DESC
LIMIT 3;

duplication is allowed.

course_id	course_name	credits
102	Python	4
103	Data Science	4
101	SQL Basics	3

Table: enrollments

enrollment_id	student_id	course_id	grade
1	1	101	85
2	2	102	78
3	3	103	90
4	4	104	88
5	5	105	82

SELECT MAX(grade) AS max_grade
FROM Enrollments;

max_grade
90

SELECT MIN(grade) AS min_grade
FROM Enrollments;

Min_grade
78

SELECT AVG(grade) As avg_grade
FROM Enrollments;

avg_grade
84.6

10.* SELECT course_id,
COUNT(enrollment_id) AS enrollment_count
FROM Enrollments
GROUP BY course_id;

course_id	Enrollment count
101	1
102	2
103	3
104	4
105	5

Table: salaries

Employee_id	name	department	salary	bonus
1	Tom	IT	60000	5000
2	Jerry	HR	55000	4000
3	Spike	Finance	70000	6000
4	Tyke	IT	62000	5500
5	Butch	HR	54000	3500

11. SELECT department,
SUM (salary) AS total_salary
FROM salaries
GROUP BY department;

department	total salary
IT	122 000
HR	109 000
Finance	70 000

SELECT department,
SUM (bonus) AS total_bonus
FROM salaries
GROUP BY department;

department	total_bonus
IT	105 000
HR	75 000
Finance	6000

12. SELECT department,
AVG (salary) AS avg_salary
FROM salaries
GROUP BY department
HAVING average_salary > 55 000;

department	avg_salary
IT	61 000
Finance	70 000

13. SELECT employee_id,
name,
salary,
bonus
(salary+bonus) As total_compensation
FROM salaries
WHERE total_compensation > 60 000;

Employee_id	name	salary	bonus	total_comp
1	Tom	60000	5000	65000
3	Spike	70000	6000	76000
4	Tyke	62000	5500	67500

Table: Projects

Project_id	project_name	department	budget
1	AI App	IT	120 000
2	Payral system	Finance	80 000
3	Dashboard	IT	150 000
4	Website	Marketing	60000
5	HR Portal	HR	50 000

14. SELECT department,
SUM(budget) As total_budget, AVG(budget) As avg_budget
FROM Projects
GROUP BY department
HAVING avg_budget > 70000;

department	total_budget	avg_budget
IT	270 000	135 000
Finance	80 000	80 000

15. SELECT *
FROM Projects
WHERE budget BETWEEN 50 000 and 120 000
AND department ≠ 'Marketing'

Project_id	project_name	department	budget
1	AI App	IT	120 000
2	Payroll System	Finance	80 000
5	HR Portal	HR	50 000