

Brightlearn Data Analytics

Exercise 2: SQL Aggregate Functions & SQL Operators

Instructions

- The exercise must be **handwritten** (using pen and paper).
- For **each query**, please **draw the expected output table**.

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. List all distinct departments in the students table.

Expected Columns:

- department

2. Get the average age of students per department.

Expected Columns:

- department, avg_age

3. Show departments with more than 1 student.

Expected Columns:

- department, student_count

4. Get all students whose age is between 21 and 23.

Expected Columns:

- student_id, name, age, department

5. List all students in the IT or HR department who are older than 21.

Expected Columns:

- student_id, name, age, department
-

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. Show total credits per department, only for departments with more than 5 total credits.

Expected Columns:

- department, total_credits

7. List all courses that do not have 4 credits.

Expected Columns:

- course_id, course_name, department, credits

8. Show the top 3 courses by credits in descending order.

Expected Columns:

- course_id, course_name, credits
-

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

G. Get the maximum, minimum, and average grade across all enrollments.

Expected Columns:

- max_grade, min_grade, avg_grade

10. Count how many enrollments exist per course.

Expected Columns:

- course_id, enrollment_count
-

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. Find total salary and total bonus per department.

Expected Columns:

- department, total_salary, total_bonus

12. Show departments where average salary is above 55,000.

Expected Columns:

- department, avg_salary

13. List employees whose salary plus bonus is greater than 60,000.

Expected Columns:

- employee_id, name, salary, bonus, total_compensation
-

Table: projects

project_id	project_name	department	budget
1	AI App	IT	120000
2	Payroll System	Finance	80000
3	Dashboard	IT	150000
4	Website	Marketing	60000
5	HR Portal	HR	50000

14. Show total and average budget per department. Only include departments with average budget above 70,000.

Expected Columns:

- department, total_budget, avg_budget

15. List all projects with budgets between 50,000 and 120,000, excluding the Marketing department.

Expected Columns:

- project_id, project_name, department, budget