Practice Questions:

1. **Assume you are given the table below containing information on user_transactions for particular products. Write a query to obtain the year-on-year growth rate for the total spend of each product for each year.**

user_transaction table :

transaction_id	product_id	spend	transaction_date
1001	2001	1500.60	12/31/2019 08:00:00
1002	2001	1000.20	12/31/2020 08:00:00
1003	2001	1246.44	12/31/2021 08:00:00
1004	2001	2145.32	12/31/2022 08:00:00

Sample Output:

Year	product_id	curr_year_spend	prev_year_spend	yoy_rate
2019	2001	1500.60	Null	Null
2020	2001	1000.20	1500.60	-33.35
2021	2001	1246.44	1000.20	24.62
2022	2001	2145.32	1246.44	72.12

2. **Sometimes, payment transactions are repeated by accident; it could be due to user error, API failure or a retry error that causes a credit card to be charged twice. Using the transactions table, identify any payments made at the same merchant with the same credit card for the same amount within 10 minutes of each other. Count such repeated payments.**

Note : The first transaction of such payments should not be counted as a repeated payment. This means, if there are two transactions performed by a merchant with the same credit card and for the same amount within 10 minutes, there will only be 1 repeated payment.

Transactions table :

transaction_id	merchant_id	creditcard_id	amount	transaction_timestamp
1	101	1	200	09/25/2022 12:00:00
2	101	1	200	09/25/2022 12:08:00
3	101	1	200	09/25/2022 12:28:00
4	102	2	300	09/25/2022 12:00:00
5	102	2	400	09/25/2022 14:00:00

Sample Output:

payment_count
1

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3. **Assume you are given the table below containing information on Amazon customers and their spend on products belonging to various categories. Identify the top two highest-grossing products within each category in 2022. Output the category, product, and total spend.**

product_spend Table:

category	product	user_id	spend	transaction_date
appliance	refrigerator	165	246.00	12/26/2021 12:00:00
appliance	refrigerator	123	299.99	03/02/2022 12:00:00
appliance	Washing machine	123	219.80	03/02/2022 12:00:00
electronics	vaccum	178	152.00	04/05/2022 12:00:00
electronics	headset	156	249.90	07/08/2022 12:00:00
electronics	vaccum	145	189.00	07/15/2022 12:00:00

Sample Output:

Category	product	total_spend
Appliance	refrigerator	299.99
Appliance	Washing machine	219.80
Electronics	vaccum	341.00
Electronics	headset	249.90

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4. **Facebook is analysing its user signup data for June 2022. Write a query to generate the churn rate by week in June 2022. Output the week number (1, 2, 3, 4, ...) and the corresponding churn rate rounded to 2 decimal places. For example, week number 1 represents the dates from 30 May to 5 Jun, and week 2 is from 6 Jun to 12 Jun.**

Note:

1.If the last_login date is within 28 days of the signup_date, the user can be considered not churned.

2.If the last_login is more than 28 days after the signup date, the user churn.

users table:

user_id	signup_date	last_login
1001	06/01/2022 12:00:00	07/05/2022 12:00:00
1002	06/03/2022 12:00:00	06/15/2022 12:00:00
1003	06/02/2022 12:00:00	06/15/2022 12:00:00
1004	06/15/2022 12:00:00	06/27/2022 12:00:00
1005	06/16/2022 12:00:00	07/22/2022 12:00:00

Sample Output:

signup_week	churn_rate
22	33.34
24	50.00

5. **Passengers book tickets for flights in advance. If a passenger books a ticket for a flight and there are still empty seats available on the flight, the passenger's ticket will be confirmed. However, the passenger will be on a waitlist if the flight is already at full capacity.**

Write a solution to determine the current status of flight tickets for each passenger.Return the result table ordered by passenger_id in ascending order.

Flights Table

flight_id	capacity
1	2
2	2
3	1

Passengers Table

passenger_id	flight_id	booking_time
101	1	2023-07-10 16:30:00
102	1	2023-07-10 17:45:00
103	1	2023-07-10 12:00:00
104	2	2023-07-05 13:23:00
105	2	2023-07-05 09:00:00
106	3	2023-07-08 11:10:00
107	3	2023-07-08 09:10:00

Sample Output:

passenger_id	status
101	Confirmed
102	Waitlist

103	Confirmed
104	Confirmed
105	Confirmed
106	Waitlist
107	Confirmed

6. **A company wants to hire new employees. The budget of the company for the salaries is $70000. The company's criteria for hiring are:**
    - **Hiring the largest number of seniors.**
    - **After hiring the maximum number of seniors, use the remaining budget to hire the largest number of juniors.**

Write a solution to find the number of seniors and juniors hired under the mentioned criteria.

Candidates table:

employee_id	Experience	salary
1	Junior	10000
9	Junior	10000
2	Senior	20000
11	Senior	20000
13	Senior	50000
4	Junior	40000

Sample output:

Experince	accepted_candidates
Senior	2

Junior	2

7. The winning streak of a player is the number of consecutive wins uninterrupted by draws or losses.

Write a solution to count the longest winning streak for each player.

Matches table:

Player_id	Match_day	Result
1	2022-01-17	Win
1	2022-01-18	Win
1	2022-01-25	Win
1	2022-01-31	Draw
1	2022-02-08	Win
2	2022-02-06	Lose
2	2022-02-08	Lose
3	2022-03-30	Win

Sample Output:

Player_id	Longest_streak
1	3
2	0
3	1

8. Write a solution to find managers with at least five direct reports.

Employee table:

Id	Name	Department	ManagerId
101	John	A	null
102	Dan	A	101
103	James	A	101
104	Amy	A	101
105	Anne	A	101
106	Ron	B	101

Sample output:

Name
John

9. Write a solution to report the customer ids from the Customer table that bought all the products in the Product table.

Customer table:

customer_id	product_key
1	5
2	6
3	5
3	6
1	6

Product table:

Product_key

5
6

Sample output :

customer_id
1
3

10. Write a solution to find the percentage of immediate orders in the first orders of all customers, rounded to 2 decimal places.

Note :

1)If the customer's preferred delivery date is the same as the order date, then the order is called immediate; otherwise, it is called scheduled.
2)The first order of a customer is the order with the earliest order date that the customer made. It is guaranteed that a customer has precisely one first order.

Delivery table:

delivery_id	customer_id	order_date	customer_pref_delivery_date
1	1	2019-08-01	2019-08-02
2	2	2019-08-02	2019-08-02
3	1	2019-08-11	2019-08-12
4	3	2019-08-24	2019-08-24
5	3	2019-08-21	2019-08-22
6	2	2019-08-11	2019-08-13

7	4	2019-08-09	2019-08-09

Sample output:

Immediate_percentage
50.00

11. Write a solution to report the number of grand slam tournaments won by each player. Do not include the players who did not win any tournament.

Players table:

Player_id	Player_name
1	Nadal
2	Federer
3	Novak

Champions table:

Year	Wimbledon	Fr_open	US_open	AU_open
2018	1	1	1	1
2019	1	1	2	2
2020	2	1	2	2

Note : Each row of this table contains the IDs of the players who won one each tennis tournament of the grand slam.

Sample output:

player_id	player_name	grand_slams_count

2	Federer	5
1	Nadal	7

12. Write a solution that reports for each user the product id on which the user spent the most money. In case the same user spent the most money on two or more products, report all of them.

Sales table:

Sale_id	Product_id	User_id	Quantity
1	1	101	10
2	3	101	7
3	1	102	9
4	2	102	6
5	3	102	10
6	1	102	6

Product table:

Product_id	Price
1	10
2	25
3	15

Sample output:

user_id	product_id
101	3

102	1
102	2
102	3

13. Write a solution to calculate the difference in the total score (sum of all 3 assignments) between the highest score obtained by students and the lowest score obtained by them.

Scores table:

student_id	student_name	assignment1	assignment2	assignment3
309	Owen	88	47	87
321	Claire	98	95	37
338	Julian	100	64	43
423	Peyton	60	44	47
896	David	32	37	50
235	Camila	31	53	69

Sample output:

Difference_in_score
111

14. Write a solution to report the distance travelled by each user.

Return the result table ordered by travelled_distance in descending order, if two or more users travelled the same distance, order them by their name in ascending order.

Users table:

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Id	Name
1	Alice
2	Bob
3	Alex
4	Donald
7	Lee
13	Jonathan
19	Elvis

Rides table:

Id	User_id	Distance
1	1	120
2	2	317
3	3	222
4	7	100
5	13	312
6	19	50
7	7	120
8	19	400
9	7	230

Sample output:

Name	Travelled_distance
Elvis	450
Lee	450

Bob	317
Jonathan	312
Alex	222
Alice	120
Donald	0

15. Write a solution for each user, return the number of followers.

Return the result table ordered by user_id in ascending order.

Followers table:

User_id	Follower_id
0	1
1	0
2	0
2	1

Sample output:

User_id	Followers_count
0	1
1	1
2	2

16. Write a solution to find all the classes that have at least five students

Course table:

Student	Class

A	Math
B	English
C	Math
D	Biology
E	Math
F	Computer
G	Math
H	Math
I	Math

Sample output:

Class
Math

17. You have a UserActivity table with user_id, activity_date. Write a SQL query to find the number of active users each month. An active user is defined as a user who has logged in at least three times in a month.

UserActivity table:

user_id	activity_date
1	2024-01-10
1	2024-01-15
1	2024-01-20

2	2024-01-05
3	2024-01-07
3	2024-01-13
4	2024-02-11
4	2024-02-15
4	2024-02-20
4	2024-02-25
5	2024-02-01
5	2024-02-02
6	2024-03-10
6	2024-03-11
6	2024-03-12
7	2024-03-20
7	2024-03-21
7	2024-03-22

Sample output:

Year	month	active_users
2024	1	1
2024	2	1
2024	3	2

18. Find the largest single number. If there is no single number report null

Note: A single number is a number that appears only once in Mynumbers table.

Mynumbers table details:

Num
8
8
3
3
1
4
5
6

Sample output:

num
6

19. Write an SQL query to list each student along with a concatenated list of the courses they are enrolled in. The courses should be listed in alphabetical order and separated by commas.

Course_enrollment table:

Student_id	Student_name	Course
1	Alice	Mathematics
1	Alice	Physics

2	Bob	Chemistry
3	Charlie	Biology
3	Charlie	Physics
3	Charlie	Mathematics

Output sample:

Student_name	Enrolled_courses
Alice	Mathematics, Physics
Bob	Chemistry
Charlie	Biology, Mathematics, Physics

20. Write a solution to calculate the bonus of each employee. The bonus of an employee is 100% of their salary if the ID of the employee is an odd number and the employee's name does not start with the character 'M'. The bonus of an employee is 0 otherwise.Return the result table ordered by employee_id.

Employees table:

Employee_id	Name	Salary
2	Meir	3000
3	Michael	3800
7	Addilyn	7400
8	Juan	6100

9	Kannon	7700

Sample output:

Employee_id	Bonus
2	0
3	0
7	7400
8	0
9	7700