Q1. 28 years – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

One of the HR department's key responsibilities is to analyze employee tenure, which helps in understanding employee retention, planning retirement benefits, and recognizing long-serving employees.

Problem Statement:

You have been asked to display the details of employees who have been working in the company for **at least 28 years as of June 8, 2022**.

This involves calculating the total number of years (Total_years) each employee has been with the company and identifying those who meet or exceed the 28-year threshold.

- The result should include the columns **employee_id**, **first_name**, **last_name**, and the **Total_years** they've worked with us.
- The result should be ordered by **employee_id** in **ascending order** for clarity and ease of reference.

Note:

- To get the **Total_years,** calculate the difference in days between the hire date and June 8, 2022.
- Then, convert this difference into years by dividing by 365.
- Don't forget to round the total years up to **two decimal points**.

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL	100	90
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL	100	90
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL	102	60
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL	103	60
105	David	Austin	DAUSTIN	590.423.4569	1997-06-25	IT_PROG	4800	NULL	103	60
106	Valli	Pataballa	VPATABAL	590.423.4560	1998-02-05	IT_PROG	4800	NULL	103	60
107	Diana	Lorentz	DLORENTZ	590.423.5567	1999-02-07	IT_PROG	4200	NULL	103	60

Sample Output:

employee_id	first_name	last_name	Total_years
101	Neena	Kochhar	32.73
102	Lex	De Haan	29.42
103	Alexander	Hunold	32.45
104	Bruce	Ernst	31.07

Q2. Extract year – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

The HR department frequently needs to analyze number of employees hired each year to understand workforce growth and plan for future hiring needs.

Problem Statement:

You have been asked to count the number of employees hired each year and save this value as Employees_count. The report should only consider employees who are currently employed (i.e., those holding current jobs).

- The result should include the columns **Year** and **Employees_count**.
- The result should be ordered -
    - by **Employees_count** in **descending order** to highlight the years with the highest hiring, and
    - by **Year** in **ascending order** to maintain chronological order within ties.

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	25000	NULL	NULL	90
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL	100	90
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL	102	60
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL	103	60
200	Jennifer	Whalen	JWHALEN	515.123.4444	1987-09-17	AD_ASST	4400	NULL	101	10

Sample Output:

Year	Employees_count
1987	2
1989	1
1990	1
1991	1

Q3. Less than a year – Use HR Dataset

Context:

Horizon is a leading company in the industry, known for its dynamic work environment and diverse team of professionals. They believe that understanding employee tenure is crucial for evaluating work experience and managing HR records effectively. Analyzing past job details helps in identifying employees who had shorter employment periods and provides insights into their career trajectory and contributions.

As a data analyst at Horizon, you need to extract the lists of the employees who worked for less than a year in any of their past positions. This information will assist the HR team in reviewing employment history and making informed decisions regarding career progression.

Problem Statement:

Write a query to display the details of employees who had worked **less than a year** in any of their past jobs.

Result:

- Return the columns '**employee_id**', '**full_name**'(first name and last name separated by space), and '**job_title**'.
- Return the result ordered by **employee_id**, and **job_title** in ascending order.

Note:

1. To calculate the number of years employees worked take the difference between the end_date and the start_date and divide the result by 365.
2. For simplicity not considering the leap year.
3. Referring only to the past jobs of the employees. Refer to the **job_history** table to get the past job details of the employees.

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL	100	30
118	Guy	Himuro	GHIMURO	515.127.4565	1998-11-15	PU_CLERK	2600	NULL	114	30
122	Payam	Kaufling	PKAUFLIN	650.123.3234	1995-05-01	ST_MAN	7900	NULL	100	50
176	Jonathon	Taylor	JTAYLOR	011.44.1644.429265	1998-03-24	SA_REP	8600	0.2	149	80
202	Pat	Fay	PFAY	603.123.6666	1997-08-17	MK_REP	6000	NULL	201	20
203	Susan	Mavris	SMAVRIS	515.123.7777	1994-06-07	HR_REP	6500	NULL	101	40

Table: jobs

job_id	job_title	min_salary	max_salary
HR_REP	Human Resources Representative	4000	9000
MK_MAN	Marketing Manager	9000	15000
MK_REP	Marketing Representative	4000	9000
PU_CLERK	Purchasing Clerk	2500	5500
PU_MAN	Purchasing Manager	8000	15000
SA_MAN	Sales Manager	10000	20000
SA_REP	Sales Representative	6000	12000
SH_CLERK	Shipping Clerk	2500	5500
ST_CLERK	Stock Clerk	2000	5000
ST_MAN	Stock Manager	5500	8500

Table: job_history

employee_id	start_date	end_date	job_id	department_id
101	1989-09-21	1993-10-27	AC_ACCOUNT	110
101	1993-10-28	1997-03-15	AC_MGR	110
102	1993-01-13	1998-07-24	IT_PROG	60
114	1998-03-24	1999-12-31	ST_CLERK	50
122	1999-01-01	1999-12-31	ST_CLERK	50
176	1998-03-24	1998-12-31	SA_REP	80
176	1999-01-01	1999-12-31	SA_MAN	80
200	1987-09-17	1993-06-17	AD_ASST	90
200	1994-07-01	1998-12-31	AC_ACCOUNT	90
201	1996-02-27	1999-12-19	MK_REP	20

Sample Output:

employee_id	full_name	job_title
122	Payam Kaufling	Stock Clerk
176	Jonathon Taylor	Sales Manager
176	Jonathon Taylor	Sales Representative

Sample Explanation:

The output lists the details of employees who worked for less than a year in their past jobs, ordered by employee_id and job_title in ascending order.

Q4. Convert Date Format

Context:

Data Solutions Inc., a leading data analytics company, specializes in transforming raw data into meaningful insights. One of the key aspects of their service is creating readable and human-friendly reports. They aim to fulfil the common requirement to ensure that reports are easily understood by all stakeholders.

As a data analyst at Data Solutions Inc., you are responsible for proper formatting of the data which will improve the readability of reports and provide clear insights for decision-makers.

Problem Statement:

Write a query to convert each date in the **days** table into a specific string format that includes the `day name`, `month name`, `day`, and `year`.

Result:

- Return the result with column name `**day**` and order the result by day in ascending order.

Sample Input:

Table: days

day
2022-04-12
2021-08-09
2020-06-26

Sample output:

day
Friday, June 26, 2020
Monday, August 9, 2021
Tuesday, April 12, 2022

Sample Explanation:

In this output, each date from the **days** table is converted into the "day_name, month_name, day, year" format and ordered by the day column in ascending order.

Q5. Six months – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

One common requirement from the HR department is to identify employees hired within specific date ranges and highlight those with the highest salaries in each department. This helps in understanding hiring trends and salary distributions.

Problem Statement:

You have been asked to display the details of employees who were hired between the specified date '**1998-01-01**' and **six months before** this date (i.e., '1997-07-01').

Additionally, the report should only include employees with the **highest salary in each department**.

- The result should contain the columns **employee_id**, **first_name**, **last_name**, **salary**, **hire_date**, and **department_id**.
- The result should be ordered by **department_id** and **employee_id** in **ascending order** for clarity and ease of reference.

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL	100	30
115	Alexander	Khoo	AKHOO	515.127.4562	1995-05-18	PU_CLERK	3100	NULL	114	30
116	Shelli	Baida	SBAIDA	515.127.4563	1997-12-24	PU_CLERK	2900	NULL	114	30
117	Sigal	Tobias	STOBIAS	515.127.4564	1997-07-24	PU_CLERK	2800	NULL	114	30
118	Guy	Himuro	GHIMURO	515.127.4565	1998-11-15	PU_CLERK	2600	NULL	114	30
119	Karen	Colmenares	KCOLMENA	515.127.4566	1999-08-10	PU_CLERK	2500	NULL	114	30
200	Jennifer	Whalen	JWHALEN	515.123.4444	1987-09-17	AD_ASST	4400	NULL	101	10
201	Michael	Hartstein	MHARTSTE	515.123.5555	1996-02-17	MK_MAN	13000	NULL	100	20
202	Pat	Fay	PFAY	603.123.6666	1997-08-17	MK_REP	6000	NULL	201	20

Sample Output:

employee_id	first_name	last_name	salary	hire_date	department_id
202	Pat	Fay	6000	1997-08-17	20
116	Shelli	Baida	2900	1997-12-24	30

Q6. Three months – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

One common requirement from the HR department is to identify employees hired within specific date ranges for various activities like onboarding programs, salary reviews, or compliance reporting.

Problem Statement:

You have been asked to display the details of employees who were hired between the specified date '**1998-01-01**' and **three months** from that date.

- The result should include the columns **employee_id**, **first_name**, **last_name**, **salary**, **department_name**, **hire_date**, and **city**.
- The result should be ordered by **employee_id** in **ascending order** to maintain clarity and ease of reference.

Note: To get the three months interval, use the **DATE_ADD()** function and add the interval by **90 days** from the given date (i.e., three months).

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
105	David	Austin	DAUSTIN	590.423.4569	1997-06-25	IT_PROG	4800	NULL	103	60
106	Valli	Pataballa	VPATABAL	590.423.4560	1998-02-05	IT_PROG	4800	NULL	103	60
107	Diana	Lorentz	DLORENTZ	590.423.5567	1999-02-07	IT_PROG	4200	NULL	103	60
108	Nancy	Greenberg	NGREENBE	515.124.4569	1994-08-17	FI_MGR	12000	NULL	101	100
109	Daniel	Faviet	DFAVIET	515.124.4169	1994-08-16	FI_ACCOUNT	9000	NULL	108	100
110	John	Chen	JCHEN	515.124.4269	1997-09-28	FI_ACCOUNT	8200	NULL	108	100
111	Ismael	Sciarra	ISCIARRA	515.124.4369	1997-09-30	FI_ACCOUNT	7700	NULL	108	100
112	Jose Manuel	Urman	JMURMAN	515.124.4469	1998-03-07	FI_ACCOUNT	7800	NULL	108	100

Table: departments

department_id	department_name	manager_id	location_id
50	Shipping	121	1500
60	IT	103	1400
70	Public Relations	204	2700
80	Sales	145	2500
90	Executive	100	1700
100	Finance	108	1700

Table: locations

location_id	street_address	postal_code	city	state_province	country_id
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1600	2007 Zagora St	50090	South Brunswick	New Jersey	US
1700	2004 Charade Rd	98199	Seattle	Washington	US
2700	Schwanthalerstr. 7031	80925	Munich	Bavaria	DE

Sample Output:

employee_id	first_name	last_name	salary	department_name	hire_date	city
106	Valli	Pataballa	4800	IT	1998-02-05	Southlake
112	Jose Manuel	Urman	7800	Finance	1998-03-07	Seattle

Q7. FB comments

Context:

Facebook is a social media platform where users can post comments, interact with each other, and engage in discussions. The platform stores detailed data about user activities.

The analytics team at Facebook needs to count the number of comments received by each user within a defined timeframe to understand user activity and engagement.

Problem Description:

You have been asked to write a query to calculate the total number of comments received by each user **within 30 or fewer days before the date '2020-02-10'**. The result should be saved in a column named comments_count.

Note:

- The result should include the columns **user_id** and **comments_count**.
- The result should be ordered by **user_id** in **ascending order** for clarity and ease of reference.
- Users who haven't received any comments in the defined time period should not be included in the output.

Sample Input:
Table: fb_comments

user_id	created_at	number_of_comments
4	2019-12-22	1
4	2020-02-15	1
4	2020-01-01	1
5	2020-01-23	1
5	2019-12-19	1
5	2019-12-19	1
7	2019-12-24	1
7	2020-01-01	1
7	2020-02-15	1
8	2020-02-10	1
8	2020-02-05	1
8	2020-01-13	1
8	2020-01-22	1

Sample Output:

user_id	comments_count
5	1
8	4

Sample Explanation:

- Users with **user_id 4 and 7** are not included in the output as they haven't received any comment in the defined time period.
- Users with **user_id 5 and 8** are included in the output as they have received some comments in the defined time period.

Q8. Day, Month, Year – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

Problem Statement:

You are tasked with extracting critical data from the Human Resource database of your current company in order to support year-end financial analysis.

Write an SQL query to retrieve the following information:

- **employee_id**, **first_name**, **last_name**, **salary**, **hire_date**, along with the columns **Day**, **Month**, and **Year** extracted from the employee's **hire_date**.
- Filter the data to include only employees **hired in January 2000** and **earning salaries greater than $5000**.
- The results should be sorted by **employee_id** in **ascending order** to facilitate comprehensive review and performance evaluation.

Sample Input:

Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
145	John	Russell	JRUSSEL	011.44.1344.429268	1996-10-01	SA_MAN	14000	0.4	100	80
146	Karen	Partners	KPARTNER	011.44.1344.467268	1997-01-05	SA_MAN	13500	0.3	100	80
147	Alberto	Errazuriz	AERRAZUR	011.44.1344.429278	1997-03-10	SA_MAN	12000	0.3	100	80
148	Gerald	Cambrault	GCAMBRAU	011.44.1344.619268	1999-10-15	SA_MAN	11000	0.3	100	80
149	Eleni	Zlotkey	EZLOTKEY	011.44.1344.429018	2000-01-29	SA_MAN	10500	0.2	100	80
150	Peter	Tucker	PTUCKER	011.44.1344.129268	1997-01-30	SA_REP	10000	0.3	145	80

Sample Output:

employee_id	first_name	last_name	salary	hire_date	Day	Month	Year
149	Eleni	Zlotkey	10500	2000-01-29	29	1	2000

Q9. 25 yrs experience – Use HR Dataset

Context:

GlobalTech Solutions is a multinational company with thousands of employees spread across various departments.

The company's Human Resources (HR) department maintains a comprehensive database to manage employee information, including personal details, employment history, and departmental affiliations.

One of the HR department's tasks is to analyze the tenure of managers within the company. This helps in identifying experienced managers, planning for succession, and recognizing long-serving employees.

Problem Statement:

You have been asked to display the details of managers who have been working in the company for **more than 25 years as of June 8, 2022**.

This involves calculating the total number of years each manager has been with the company and saving it as Experience.

Result:

- The result should include the columns **employee_id**, **first_name**, **last_name**, **salary**, **department_name**, and **Experience**.
- The result should be ordered by **employee_id** in **ascending order** for clarity and ease of reference.

Note:

- To get the **Experience** of the managers, calculate the difference in days between the hire date and June 8, 2022.
- Then, convert this difference into years by dividing by 365.
- Don't forget to round the total years up to **four decimal points**.

Sample Input:
Table: employees

employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	25000	NULL	NULL	90
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL	100	90
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL	100	90
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL	102	60
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL	103	60
105	David	Austin	DAUSTIN	590.423.4569	1997-06-25	IT_PROG	4800	NULL	103	60

- The **manager_id** in the employees table is the employee_id of the manager.

Table: departments

department_id	department_name	manager_id	location_id
50	Shipping	121	1500
60	IT	103	1400
70	Public Relations	204	2700
80	Sales	145	2500
90	Executive	100	1700

Sample Output:

employee_id	first_name	last_name	salary	department_name	Experience
100	Steven	King	25000	Executive	35.0000
102	Lex	De Haan	17000	Executive	29.4192
103	Alexander	Hunold	9000	IT	32.4493