Business Problems

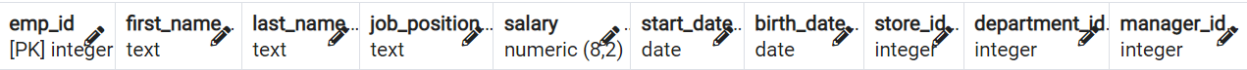
In your company there hasn't been a database table with all the employee information yet. You need to set up the table called employees in the following way.

Task 1

Task 1.1

In your company there hasn't been a database table with all the employee information yet.

You need to set up the table called employees in the following way:



There should be NOT NULL constraints for the following columns:

first_name,

last_name ,

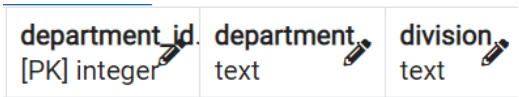
job_position,

start_date DATE,

birth_date DATE

Task 1.2

Set up an additional table called departments in the following way:



Additionally no column should allow nulls.

Task 2

Alter the employees table in the following way:

- Set the column department_id to not null.

- Add a default value of CURRENT_DATE to the column start_date.

- Add the column end_date with an appropriate data type (one that you think makes sense).

- Add a constraint called birth_check that doesn't allow birth dates that are in the future.

- Rename the column job_position to position_title.

Task 3

Task 3.1

Insert the following values into the *employees* table.

There will be most likely an error when you try to insert the values.

So, try to insert the values and then fix the error.

Columns:

(emp_id,first_name,last_name,position_title,salary,start_date,birth_date,store_id,department_id,
manager_id,end_date)

Values:

(1,'Morrie','Conaboy','CTO',21268.94,'2005-04-30','1983-07-10',1,1,NULL,NULL),
(2,'Miller','McQuarter','Head of BI',14614.00,'2019-07-23','1978-11-09',1,1,1,NULL),
(3,'Christalle','McKenny','Head of Sales',12587.00,'1999-02-05','1973-01-09',2,3,1,NULL),
(4,'Sumner','Seares','SQL Analyst',9515.00,'2006-05-31','1976-08-03',2,1,6,NULL),
(5,'Romain','Hacard','BI Consultant',7107.00,'2012-09-24','1984-07-14',1,1,6,NULL),
(6,'Ely','Luscombe','Team Lead Analytics',12564.00,'2002-06-12','1974-08-01',1,1,2,NULL),
(7,'Clywd','Filyashin','Senior SQL Analyst',10510.00,'2010-04-05','1989-07-23',2,1,2,NULL),
(8,'Christopher','Blague','SQL Analyst',9428.00,'2007-09-30','1990-12-07',2,2,6,NULL),
(9,'Roddie','Izen','Software Engineer',4937.00,'2019-03-22','2008-08-30',1,4,6,NULL),
(10,'Ammamaria','Izhak','Customer Support',2355.00,'2005-03-17','1974-07-27',2,5,3,2013-04-
14),
(11,'Carlyn','Stripp','Customer Support',3060.00,'2013-09-06','1981-09-05',1,5,3,NULL),
(12,'Reuben','McRorie','Software Engineer',7119.00,'1995-12-31','1958-08-15',1,5,6,NULL),
(13,'Gates','Raison','Marketing Specialist',3910.00,'2013-07-18','1986-06-24',1,3,3,NULL),
(14,'Jordanna','Raitt','Marketing Specialist',5844.00,'2011-10-23','1993-03-16',2,3,3,NULL),
(15,'Guendolen','Motton','BI Consultant',8330.00,'2011-01-10','1980-10-22',2,3,6,NULL),
(16,'Doria','Turbat','Senior SQL Analyst',9278.00,'2010-08-15','1983-01-11',1,1,6,NULL),
(17,'Cort','Bewlie','Project Manager',5463.00,'2013-05-26','1986-10-05',1,5,3,NULL),
(18,'Margarita','Eaden','SQL Analyst',5977.00,'2014-09-24','1978-10-08',2,1,6,2020-03-16),
(19,'Hetty','Kingaby','SQL Analyst',7541.00,'2009-08-17','1999-04-25',1,2,6,'NULL'),
(20,'Lief','Robardley','SQL Analyst',8981.00,'2002-10-23','1971-01-25',2,3,6,2016-07-01),
(21,'Zaneta','Carlozzi','Working Student',1525.00,'2006-08-29','1995-04-16',1,3,6,2012-02-19),
(22,'Giana','Matz','Working Student',1036.00,'2016-03-18','1987-09-25',1,3,6,NULL),
(23,'Hamil','Evershed','Web Developper',3088.00,'2022-02-03','2012-03-30',1,4,2,NULL),
(24,'Lowe','Diamant','Web Developper',6418.00,'2018-12-31','2002-09-07',1,4,2,NULL),

(25,'Jack','Franklin','SQL Analyst',6771.00,'2013-05-18','2005-10-04',1,2,2,NULL),
(26,'Jessica','Brown','SQL Analyst',8566.00,'2003-10-23','1965-01-29',1,1,2,NULL)

Task 3.2

Insert the following values into the departments table.

department_id [PK] integer	department text	division text
1	Analytics	IT
2	Finance	Administration
3	Sales	Sales
4	Website	IT
5	Back Office	Administration

Task 4

Task 4.1

Jack Franklin gets promoted to 'Senior SQL Analyst' and the salary raises to 7200.

Update the values accordingly.

Task 4.2

The responsible people decided to rename the position_title Customer Support to Customer Specialist.

Update the values accordingly.

Task 4.3

All SQL Analysts including Senior SQL Analysts get a raise of 6%.

Update the salaries accordingly.

Task 4.4

Question:

What is the average salary of a SQL Analyst in the company (excluding Senior SQL Analyst)?

Answer:

8834.75

Task 5

Task 5.1

Write a query that adds a column called manager that contains first_name and last_name (in one column) in the data output.

Secondly, add a column called is_active with 'false' if the employee has left the company already, otherwise the value is 'true'.

Task 5.2

Create a view called v_employees_info from that previous query.

Task 6

Write a query that returns the average salaries for each positions with appropriate roundings.

Question:

What is the average salary for a Software Engineer in the company.

Answer:

6028.00

Task 7

Write a query that returns the average salaries per division.

Question:

What is the average salary in the Sales department?

Answer:

6107.41

Task 8

Task 8.1

Write a query that returns the following:

emp_id,

first_name,

last_name,

position_title,

salary

and a column that returns the average salary for every job_position.

Order the results by the emp_id.

emp_id [PK] integer	first_name text	last_name text	position_title text	salary numeric (8,2)	avg_position_sal numeric
1	Morrie	Conaboy	CTO	21268.94	21268.94
2	Miller	McQuarter	Head of BI	14614.00	14614.00
3	Christalle	McKenny	Head of Sales	12587.00	12587.00
4	Sumner	Seares	SQL Analyst	10085.90	8834.75

Task 8.2

How many people earn less than there avg_position_salary?

Write a query that answers that question.

Ideally the output just shows that number directly.

Answer:

9

Task 9:

Write a query that returns a running total of the salary development ordered by the start_date.

In your calculation, disregard that fact that people have left the company (write the query as if they were still working for the company).

emp_id [PK] integer	salary numeric (8,2)	start_date date	avg_pos_sal numeric
12	7119.00	1995-12-31	7119.00
3	12587.00	1999-02-05	19706.00
6	12564.00	2002-06-12	32270.00
20	9519.86	2002-10-23	41789.86

Question:

What was the total salary after 2018-12-31?

Answer:

180202.70

Task 10:

Create the same running total but now also considder the fact that people were leaving the company.

Note:

This challenge is actually very difficult.

Don't worry if you can't solve it you are not expected to do so.

It is possible to solve the challenge even without the hints.

If you want you can try to solve it using the hints and it is still a difficult challenge.

Question:

What was the total salary after 2018-12-31?

Answer:

166802.84

Hint 1:
Use the view v_employees_info.

Hint 2:
Create to separate queries one with all employees and one with the people that have already left

Hint 3:
In the first query use start_date and in the second query use end_date instead of the start_date

Hint 4:
Multiply the salary of the second query with (-1).

Hint 5:
Create a subquery from that UNION and use a window function in that to create the running total.

Task 11

Task 11.1

Write a query that outputs only the top earner per position_title including first_name and position_title and their salary.

first_name text	position_title text	salary numeric (8,2)
Morrie	CTO	21268.94
Miller	Head of BI	14614.00
Christalle	Head of Sales	12587.00
Ely	Team Lead Analytics	12564.00

Question:

What is the top earner with the position_title SQL Analyst?

Answer:

Sumner with 10085.90

Task 11.2

Add also the average salary per position_title.

first_name text	position_title text	salary numeric (8,2)	avg_in_pos numeric
Morrie	CTO	21268.94	21268.94
Miller	Head of BI	14614.00	14614.00
Christalle	Head of Sales	12587.00	12587.00

Task 11.3

Remove those employees from the output of the previous query that have the same salary as the average of their position_title.

These are the people that are the only ones with their position_title.

Task 12

Write a query that returns all meaningful aggregations of

- sum of salary,

- number of employees,

- average salary

grouped by all meaningful combinations of

- division,

- department,

- position_title.

Consider the levels of hierarchies in a meaningful way.

division text	department text	position_title text	sum numeric	count bigint	round numeric
Administration	Back Office	Customer Specialist	5415.00	2	2707.50
Administration	Back Office	Project Manager	5463.00	1	5463.00
Administration	Back Office	Software Engineer	7119.00	1	7119.00
Administration	Back Office	[null]	17997.00	4	4499.25

Task 13

Write a query that returns all employees (emp_id) including their position_title, department their salary and the rank of that salary partitioned by department.

The highest salary per division should have rank 1.

emp_id integer	position_title text	department text	salary numeric (8,2)	rank bigint
1	CTO	Analytics	21268.94	1
2	Head of BI	Analytics	14614.00	2
6	Team Lead Analytics	Analytics	12564.00	3
7	Senior SQL Analyst	Analytics	11140.60	4

Question:

Which employee (emp_id) is in rank 7 in the department Analytics?

Answer:

emp_id 26

Task 14

Write a query that returns only the top earner of each department including

their emp_id, position_title, department and their salary.

Question:

Which employee (emp_id) is the top earner in the department Finance?

Answer:

emp_id 8