Human Resources Analytics:
Project Rationale and Background on the Database Tables

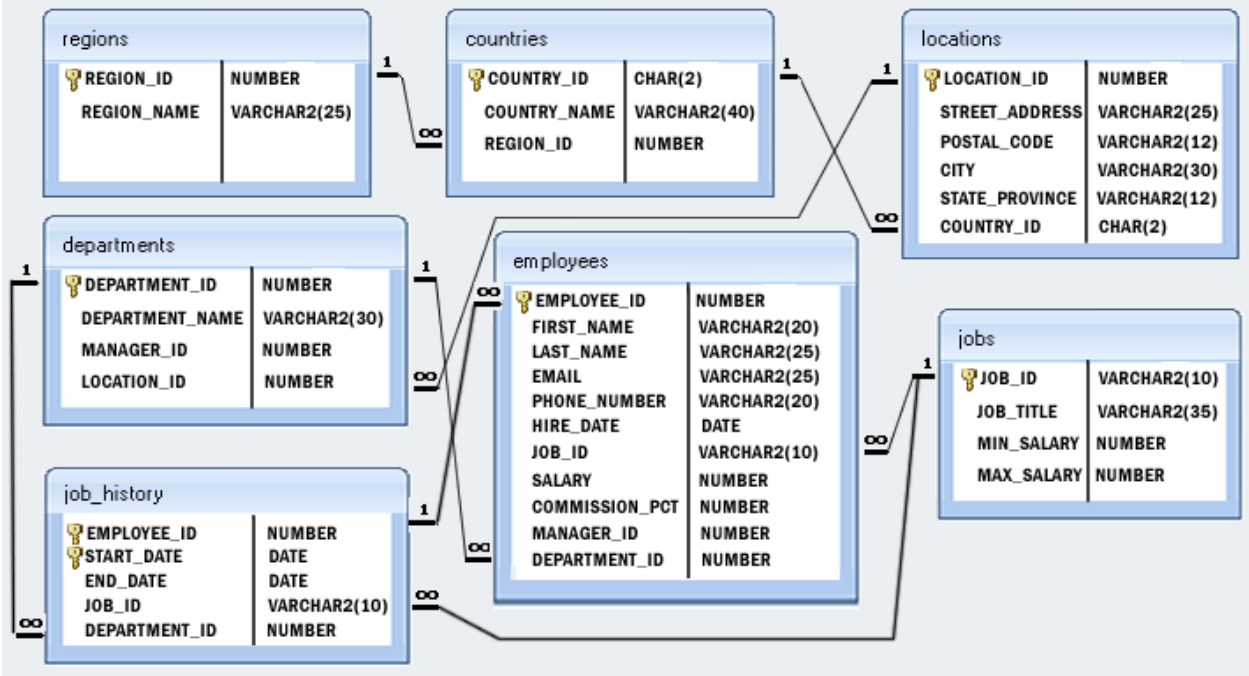
Project Rationale

With a database of 7 tables hosted on PostgreSQL, this SQL project aims to showcase my ability to write more advanced SQL queries. Via pgAdmin 4, I write queries with common types of joins, subqueries, common table expressions (CTEs) and window functions. A toy HR analytics database was employed to practice providing relevant insights and help management to answer questions that would inform personnel and compensation policies, such as:

- How many employees in the company have earned more than the average salary of their respective department?
- What is the geographical distribution of the employees in the company (by city, country or region)?
- What is the salary range of the employees in the IT department?
- Who is the employee who has been with the company the longest? Who is the most recently joined employee?

This project is ongoing as I practice and improve my SQL skills. New queries uncovering new aspects of the database will continue to be added.

Table Description and Usage



The database supports the storing of employee personal information and other business-critical records such as recruitment, job history, office location and benefit records.

The '*employees'* table is the hub of the database. Each record represents an employee at the company. By extension, the '*department'* table carries additional information that goes beyond just the department ID, including the name of the department, the manager of that department and where it is based. The '*job_history'* table provides further specific recruitment-related information of an employee, such as his/her start and end date. Linking with it is also the '*jobs'* table where further information about the employee's job is provided to include the job title and the salary range.

The '*locations'*, '*regions'* and '*countries'* tables allow us to drill down further into the geographic situation of an employee's department.

Table Listings

1. Employees

employee_id [PK] numeric (6)	first_name character varying (20)	last_name character varying (25)	email character varying (25)	phone_number character varying (20)	hire_date date	job_id character varying (10)	salary numeric (8,2)	commission_pct numeric (2,2)	manager_id numeric (6)	department_id numeric (4)
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	24000.00	0.00	0	90
101	Neena	Kochhar	SKING	515.123.4568	1987-06-18	AD_VP	17000.00	0.00	100	90
102	Lex	De Haan	SKING	515.123.4569	1987-06-19	AD_VP	17000.00	0.00	100	90
103	Alexander	Hunold	SKING	590.423.4567	1987-06-20	IT_PROG	9000.00	0.00	102	60
104	Bruce	Ernst	SKING	590.423.4568	1987-06-21	IT_PROG	6000.00	0.00	103	60

2. Jobs

job_id [PK] character varying (10)	job_title character varying (35)	min_salary numeric (6)	max_salary numeric (6)
AD_PRES	President	20000	40000
AD_VP	Administration Vice President	15000	30000
AD_ASST	Administration Assistant	3000	6000
FI_MGR	Finance Manager	8200	16000
FI_ACCOUNT	Accountant	4200	9000

3. Job_history

employee_id [PK] numeric (6)	start_date [PK] date	end_date date	job_id character varying (10)	department_id numeric (4)
102	1993-01-13	1998-07-24	IT_PROG	60
101	1989-09-21	1993-10-27	AC_ACCOUNT	110
101	1993-10-28	1997-03-15	AC_MGR	110
201	1996-02-17	1999-12-19	MK_REP	20
114	1998-03-24	1999-12-31	ST_CLERK	50

4. **Departments**

department_id [PK] numeric (4)	department_name character varying (30)	manager_id numeric (6)	location_id numeric (4)
10	Administration	200	1700
20	Marketing	201	1800
30	Purchasing	114	1700
40	Human Resources	203	2400
50	Shipping	121	1500

5. **Locations**

location_id [PK] numeric (4)	street_address character varying (40)	postal_code character varying (12)	city character varying (30)	state_province character varying (25)	country_id character varying (2)
1000	1297 Via Cola di Rie	989	Roma		IT
1100	93091 Calle della Testa	10934	Venice		IT
1200	2017 Shinjuku-ku	1689	Tokyo	Tokyo Prefecture	JP
1300	9450 Kamiya-cho	6823	Hiroshima		JP
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US

6. **Countries**

country_id [PK] character varying (2)	country_name character varying (40)	region_id numeric (10)
AR	Argentina	2
AU	Australia	3
BE	Belgium	1
BR	Brazil	2
CA	Canada	2

7. **Regions**

region_id [PK] numeric (10)	region_name character (25)
1	Europe
2	Americas
3	Asia
4	Middle East and Africa

Primary and Foreign Keys

The primary and foreign keys are also depicted in the figure above. Understandably, an employee is related to one department, one job and one job history in the company. But a region could be related to multiple countries, and a country could be related to multiple department locations. A location could have multiple departments, but a department is specific to a location.

All foreign key columns are required, the user thus must enter a valid value according to the specified integrity rules (including referential integrity). For example, when inserting a new row in the *employees* table, the user must know the employee ID.