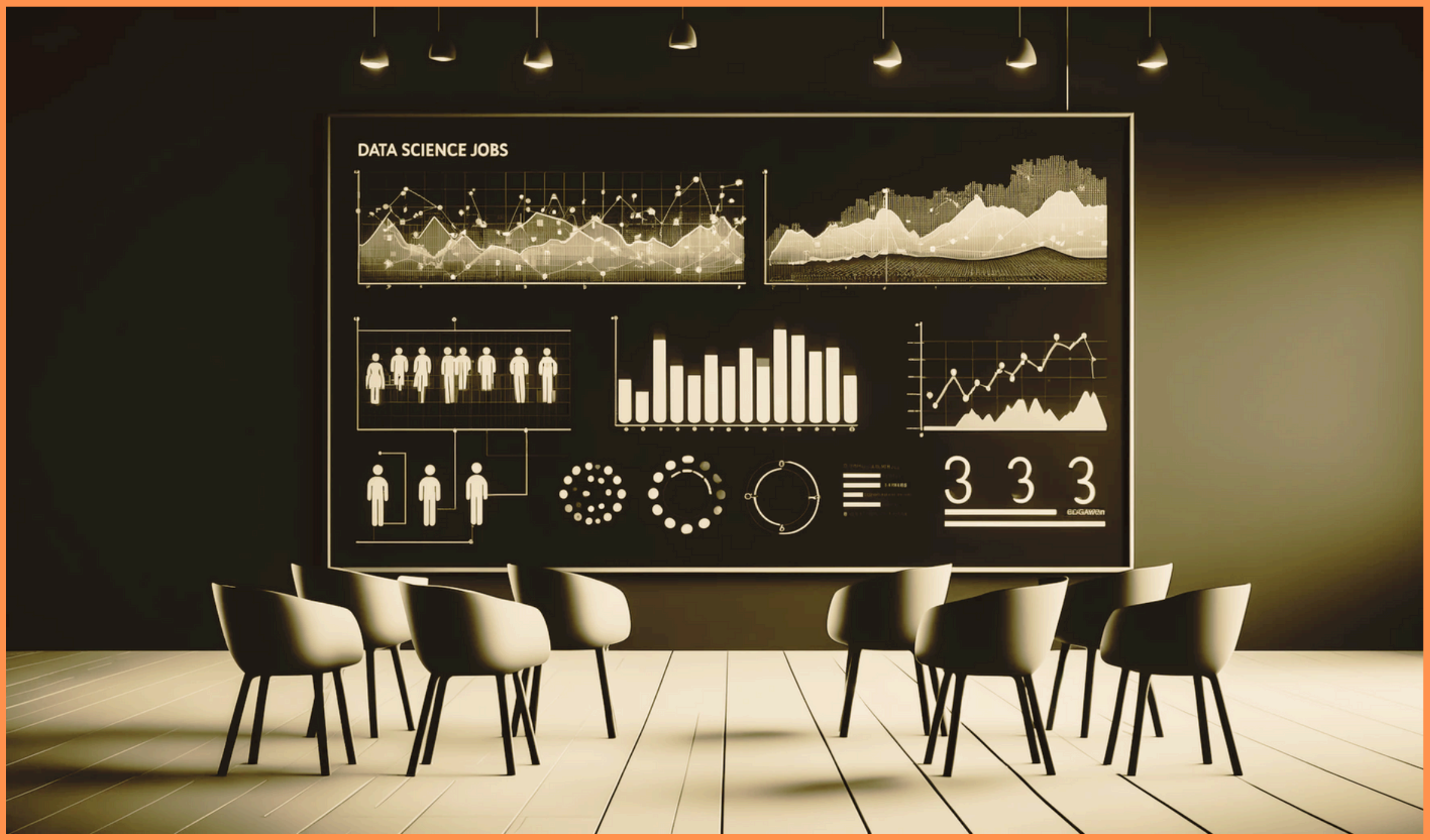
Project Overview

This analysis project involves a series of SQL queries aimed at extracting key insights from a dataset containing salary, job title, company location, and remote work ratio details. The project spans various facets of workforce analytics, including compensation trends, remote work dynamics, and geographic variations in job opportunities and salary structures. Each query is tailored to address specific strategic questions for a variety of business needs, from multinational corporations to HR consultancies and tech startups.



Remote Managers with High Salaries

Objective: Identify countries where managers can work fully remotely with salaries exceeding $90,000 USD.

Importance: Targets managerial talent preferring remote work with competitive compensation, aiding global talent acquisition strategies.

```sql
SELECT DISTINCT company_location
FROM salaries
WHERE remote_ratio = 100
  AND job_title LIKE '%Manager%'
  AND salary_in_usd > 90000;
```

company_location
AU
FR
MX
US

Insight: Pinpoints lucrative markets for remote managerial roles, essential for remote-first employment strategies.

Top Countries for Entry-Level Opportunities

Objective: Discover the top five countries with the most large company opportunities for entry-level positions.

Importance: Guides HR tech startups in directing new graduates towards markets rich in opportunity.

```sql
SELECT company_location, large_companies_count
FROM (
    SELECT company_location,
    COUNT(*) AS large_companies_count,
    RANK() OVER (ORDER BY COUNT(*) DESC) AS rn
    FROM salaries
    WHERE company_size = 'L'
      AND experience_level = 'EN'
    GROUP BY company_location
) sub1
WHERE rn <= 5;
```

company_location	large_companies_count
US	53
CA	10
DE	10
GB	8
IN	6

Insight: Helps fresh graduates and career advisors focus job search efforts in regions with significant entry-level job availability in large firms.

High-Paying Fully Remote Roles

Objective: Calculate the percentage of high-paying jobs (over $100,000) that are fully remote.

Importance: Evaluates the market for high-paying remote roles to understand their prevalence and attractiveness.

```sql
SELECT COUNT(CASE WHEN remote_ratio = 100 THEN 1 ELSE NULL END) AS remote_emp,
       COUNT(*) AS total_emp,
       CAST(ROUND(1.0 * COUNT(CASE WHEN remote_ratio = 100 THEN 1 ELSE NULL END)
       / COUNT(*) * 100, 2) AS DECIMAL(10,2)) AS 'percentage'
FROM salaries
WHERE salary_in_usd > 100000;
```

remote_emp	total_emp	percentage
3405	10563	32.24

Insight: Reveals the proportion of high-salary roles that offer full remote flexibility, highlighting trends in high-paying remote employment.

Entry-Level Salaries Above Market Average

Objective: Locate where entry-level average salaries exceed the average salary for specific job titles.
Importance: Assists recruitment agencies in guiding candidates towards better-compensated entry-level positions.

```sql
SELECT DISTINCT company_location, job_title
FROM (
    SELECT company_location,
           job_title,
           AVG(salary_in_usd) OVER (PARTITION BY job_title) AS avg_salary_market,
           AVG(salary_in_usd) OVER (PARTITION BY company_location, job_title) AS avg_sal_country
    FROM salaries
    WHERE experience_level = 'EN'
) sub1
WHERE avg_sal_country > avg_salary_market;
```

company_location	job_title
AU	Business Intelligence Analyst
AU	Computer Vision Software Engineer
BA	AI Developer
CA	AI Programmer
CA	AI Scientist
CA	Data Integration Specialist
CA	Machine Learning Engineer
CA	Machine Learning Research Engineer
CH	Data Scientist
DE	AI Developer
DE	AI Engineer
DE	Applied Machine Learning Scientist
DE	BI Data Analyst

Insight: Identifies specific locations offering above-average entry-level salaries, vital for strategic job placements.

Annual Salary Growth Rate Analysis

Objective: Assess the annual salary growth rate for various job titles.
Importance: Provides insight into salary trends, aiding HR consultants in competitive compensation planning.

```sql
WITH cte AS (
    SELECT work_year, job_title, AVG(salary_in_usd) AS avg_sal
    FROM salaries
    WHERE work_year IN (2024,2023)
    GROUP BY work_year, job_title
), final_cte AS (
    SELECT job_title,
           avg_sal,
           LAG(avg_sal) OVER (PARTITION BY job_title ORDER BY work_year)
           AS prev_year_sal,
           CAST((1.0 * avg_sal - LAG(avg_sal) OVER (PARTITION BY job_title
           ORDER BY work_year)) / LAG(avg_sal) OVER (PARTITION BY job_title
           ORDER BY work_year) * 100 AS DECIMAL (10,2)) AS perc
    FROM cte
)
SELECT job_title,
       avg_sal AS current_year,
       prev_year_sal,
       perc AS change_in_percentage
FROM final_cte
WHERE perc IS NOT NULL
ORDER BY change_in_percentage DESC;
```

job_title	current_year	prev_year_sal	change_in_percentage
Data Analyst Lead	125000	18000	594.44
Data Analytics Lead	226525	89011	154.49
ETL Engineer	150000	72286	107.51
Data Operations Specialist	109153	55355	97.19
AI Research Engineer	131666	70117	87.78
Prompt Engineer	256470	145292	76.52
Data Management Analyst	102371	70500	45.21
Head of Machine Learning	376000	259000	45.17
Research Analyst	136109	96511	41.03
MLOps Engineer	181250	131269	38.08
AI Scientist	175000	126842	37.97
Machine Learning Researcher	194950	148125	31.61
AI Product Manager	152650	120000	27.21
Business Intelligence Manager	161100	126750	27.10
Research Engineer	215822	178714	20.76
Research Scientist	221130	188847	17.09
Machine Learning Operations Engineer	140000	120000	16.67
Data Infrastructure Engineer	225205	201375	11.83
Data Visualization Specialist	127050	115860	9.66
Data Science	164335	151262	8.64
Machine Learning Scientist	205733	191347	7.52
Data Product Manager	163274	155250	5.17

Insight: Highlights job titles with the highest annual salary growth, crucial for attracting and retaining top talent in competitive fields.

Countries with Maximum Average Salary by Job Title

Objective: Determine which countries pay the highest average salary for each job title.
Importance: Enables HR consultancies to recommend job locations based on maximum earning potential.

```sql
WITH cte AS (
    SELECT company_location, job_title, AVG(salary_in_usd) as avg_sal
    FROM salaries
    GROUP BY company_location, job_title
), final_cte AS (
    SELECT *, RANK() OVER (PARTITION BY job_title ORDER BY avg_sal DESC) as rn
    FROM cte
)
SELECT company_location, job_title, avg_sal
FROM final_cte
WHERE rn = 1;
```

company_location	job_title	avg_sal
IN	Admin & Data Analyst	60000
CA	AI Architect	800000
CA	AI Developer	275000
QA	AI Engineer	300000
US	AI Product Manager	152650
FR	AI Programmer	120000
US	AI Research Engineer	175000
DE	AI Research Scientist	88888
IL	AI Scientist	417937
EG	AI Software Engineer	174100
FR	Analytics Engineer	188000
GB	Analytics Engineerin...	399880
US	Applied Data Scientist	238000
US	Applied Machine Le...	177500
US	Applied Machine Le...	141550
US	Applied Scientist	191002
GB	Autonomous Vehicl...	120000
US	AWS Data Architect	258000
NL	Azure Data Engineer	100000

Insight: Identifies top-paying locations for specific job titles, crucial for strategic job placements and career advising.

Consistent Salary Growth Locations

Objective: Pinpoint locations where the average salary has consistently increased over the past three years.
Importance: Assists multinational corporations in identifying stable and growing markets for potential investment and expansion.

```sql
WITH cte1 AS (
    SELECT company_location
    FROM salaries
    WHERE work_year IN (2024,2023,2022)
    GROUP BY company_location
    HAVING COUNT(DISTINCT work_year) = 3
), cte2 AS (
    SELECT w.company_location,
          work_year, AVG(salary_in_usd) as avg_sal,
          LAG(AVG(salary_in_usd),1,0) OVER (PARTITION BY w.company_location ORDER BY work_year) as prev_year_sal
    FROM cte1 w
    LEFT JOIN salaries s ON w.company_location = s.company_location
    WHERE work_year IN (2024,2023,2022)
    GROUP BY w.company_location, work_year
), cte3 AS (
    SELECT company_location, work_year, avg_sal, prev_year_sal, COUNT(*) OVER (PARTITION BY company_location) as flag
    FROM cte2
    WHERE avg_sal > prev_year_sal
), cte4 AS (
    SELECT company_location, work_year, avg_sal FROM cte3
    WHERE flag = 3
)
SELECT company_location,
       MAX(CASE WHEN work_year = 2022 THEN avg_sal END) AS '2022',
       MAX(CASE WHEN work_year = 2023 THEN avg_sal END) AS '2023',
       MAX(CASE WHEN work_year = 2024 THEN avg_sal END) AS '2024'
FROM cte4
GROUP BY company_location;
```

company_location	2022	2023	2024
AR	50000	65000	88500
CA	126009	150724	153611
ES	47997	60327	72184
FI	63040	71259	77777
FR	72684	100411	101370
HU	17684	43000	63333
IN	37328	47777	71538
PT	48921	51521	53054

Insight: Reveals regions with rising salary trends, valuable for long-term business and HR planning.

Remote Work Trends Over Time by Experience Level

Objective: Measure changes in the percentage of fully remote work across different experience levels between 2021 and 2024.
Importance: Informs workforce strategists on evolving remote work trends, aiding in the development of targeted employment policies.

```sql
WITH cte AS (
    SELECT distinct work_year, experience_level,
           CAST(1.0 * COUNT(CASE WHEN remote_ratio = 100 THEN 1 ELSE NULL END) OVER (PARTITION BY work_year, experience_level) /
           COUNT(remote_ratio) OVER (PARTITION BY work_year, experience_level) * 100 AS DECIMAL(10,2)) as remote_perc
    FROM salaries
    WHERE work_year IN (2021, 2024)
)
SELECT experience_level,
       MAX(CASE WHEN work_year = 2021 THEN remote_perc END) AS '2021',
       MAX(CASE WHEN work_year = 2024 THEN remote_perc END) AS '2024'
FROM cte
GROUP BY experience_level;
```

experience_level	2021	2024
EN	47.83	22.83
EX	50.00	33.02
MI	51.72	20.60
SE	58.67	25.16

Insight: Highlights significant changes in remote work adoption across experience levels, essential for adapting HR strategies.

Salary Increase Trends by Experience Level and Job Title

Objective: Calculate the average salary increase percentage between 2023 and 2024 for each experience level and job title.
Importance: Assists compensation specialists in adjusting salary structures to stay competitive.

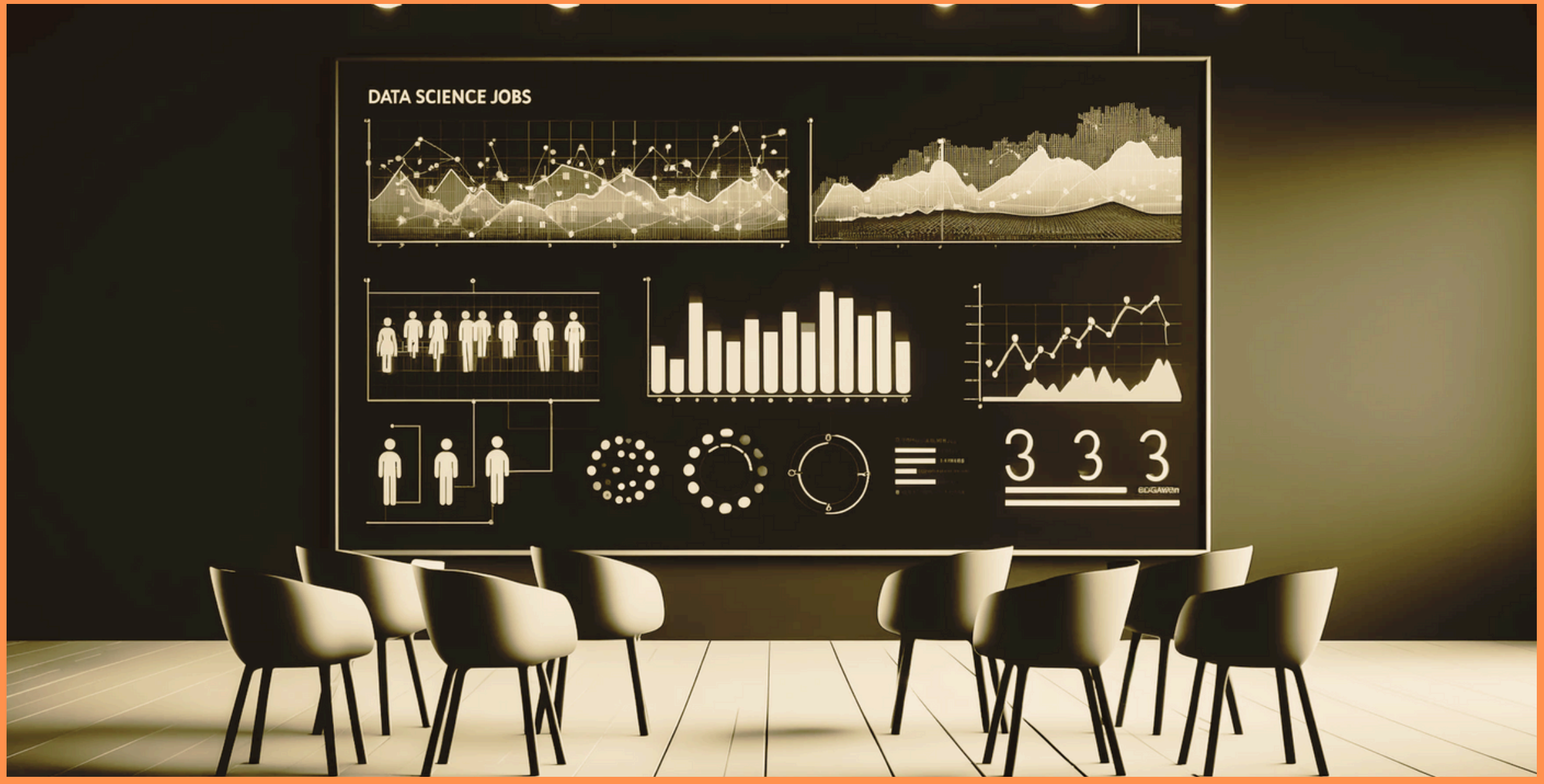
```sql
WITH cte AS (
    SELECT work_year, experience_level, job_title, AVG(salary_in_usd) as avg_salary
    FROM salaries
    WHERE work_year IN (2024,2023)
    GROUP BY work_year, experience_level, job_title
), cte2 AS (
    SELECT *, COUNT(work_year) OVER (PARTITION BY experience_level, job_title) as total_cnt
    FROM cte
), cte3 AS (
    SELECT job_title, experience_level,
           MAX(CASE WHEN work_year = 2023 THEN avg_salary END) AS '2023',
           MAX(CASE WHEN work_year = 2024 THEN avg_salary END) AS '2024',
           CAST(((1.0 * MAX(CASE WHEN work_year = 2024 THEN avg_salary END) - MAX(CASE WHEN work_year = 2023 THEN avg_salary END)) /
           MAX(CASE WHEN work_year = 2023 THEN avg_salary END)) * 100 AS DECIMAL(10,2)) as change_in_percentage
    FROM cte2
    WHERE total_cnt = 2
    GROUP BY experience_level, job_title
)
SELECT *
FROM cte3;
```

job_title	experience_level	2023	2024	change_in_percentage
AI Engineer	EN	28296	44444	57.07
Analytics Engineer	EN	88370	102333	15.80
Applied Scientist	EN	178367	135000	-24.31
Big Data Engineer	EN	130000	17600	-86.46
Business Intelligence Analyst	EN	76763	76638	-0.16
Data Analyst	EN	76922	94439	22.77
Data Engineer	EN	90634	95598	5.48
Data Management Analyst	EN	70500	104250	47.87
Data Quality Analyst	EN	43064	71750	66.61
Data Scientist	EN	93602	92734	-0.93
Machine Learning Engineer	EN	108373	130458	20.38
ML Engineer	EN	142000	27000	-80.99
Research Analyst	EN	77807	132849	70.74
Research Engineer	EN	133457	177950	33.34
Research Scientist	EN	162819	254270	56.17
Business Intelligence Devel...	EX	137000	147500	7.66
Business Intelligence Engi...	EX	209850	108000	-48.53
Data Analyst	EX	113125	102812	-9.12

Insight: Provides a detailed look at how salaries are changing across job titles and experience levels, crucial for maintaining competitive compensation packages.

Summary

The results from these queries equip stakeholders with critical insights into salary structures, remote work dynamics, and geographic employment trends. This data-driven approach not only enhances strategic decision-making but also supports effective workforce planning and competitive positioning in the global market. The findings are crucial for aligning business operations with current trends and employee expectations, ultimately fostering a more engaged and well-compensated workforce.



Thank You