GLOBAL DATA JOB MARKET: SALARY ANALYSIS WITH SQL

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BACKGROUND

The global demand for data professionals continues to surge as organizations increasingly leverage data-driven insights for strategic decision-making. Understanding compensation patterns across various experience levels, job roles, and geographical locations has become essential for both employers and job seekers. This analysis employs SQL to examine worldwide salary trends among data practitioners, with particular emphasis on three critical dimensions: regional compensation variations, experience-based pay scales, and the distribution of employment types across different data roles.

PROJECT OVERVIEW

A Objective

- Regional Salary Trends
- Experience-Based Pay Scales
- Employment Type Distribution

B Tools

- MySQL

This analysis leverages MySQL as the primary tool to query, aggregate, and interpret global salary data, enabling structured insights into compensation trends across regions, experience levels, and employment types

DATASET **OVERVIEW**

	work_year	experience	employme	job_title	salary	salary_cur	salary_in_	employee_	remote_ra	company_	company_size
0	2020	MI	FT	Data Scientist	70000	EUR	79833	DE	0	DE	L
1	2020	SE	FT	Machine Learni	260000	USD	260000	JP	0	JP	S
2	2020	SE	FT	Big Data Engine	85000	GBP	109024	GB	50	GB	M
3	2020	MI	FT	Product Data Ar	20000	USD	20000	HN	0	HN	S
4	2020	SE	FT	Machine Learni	150000	USD	150000	US	50	US	L
5	2020	EN	FT	Data Analyst	72000	USD	72000	US	100	US	L
6	2020	SE	FT	Lead Data Scier	190000	USD	190000	US	100	US	S
7	2020	MI	FT	Data Scientist	1.1E+07	HUF	35735	HU	50	HU	L
8	2020	MI	FT	Business Data A	135000	USD	135000	US	100	US	L
9	2020	SE	FT	Lead Data Engir	125000	USD	125000	NZ	50	NZ	S
10	2020	EN	FT	Data Scientist	45000	EUR	51321	FR	0	FR	S
11	2020	MI	FT	Data Scientist	3000000	INR	40481	IN	0	IN	L
12	2020	EN	FT	Data Scientist	35000	EUR	39916	FR	0	FR	M
13	2020	MI	FT	Lead Data Analy	87000	USD	87000	US	100	US	L
14	2020	MI	FT	Data Analyst	85000	USD	85000	US	100	US	L
15	2020	MI	FT	Data Analyst	8000	USD	8000	PK	50	PK	L
16	2020	EN	FT	Data Engineer	4450000	JPY	41689	JP	100	JP	S
17	2020	SE	FT	Big Data Engine	100000	EUR	114047	PL	100	GB	S
18	2020	EN	FT	Data Science C	423000	INR	5707	IN	50	IN	M
19	2020	MI	FT	Lead Data Engir	56000	USD	56000	PT	100	US	M
20	2020	MI	FT	Machine Learni	299000	CNY	43331	CN	0	CN	M
21	2020	MI	FT	Product Data Ar	450000	INR	6072	IN	100	IN	L
22	2020	SE	FT	Data Engineer	42000	EUR	47899	GR	50	GR	L
23	2020	MI	FT	BI Data Analyst	98000	USD	98000	US	0	US	M
24	2020	MI	FT	Lead Data Scier	115000	USD	115000	AE	0	AE	L
25	2020	EX	FT	Director of Data	325000	USD	325000	US	100	US	L
26	2020	EN	FT	Research Scien	42000	USD	42000	NL	50	NL	L
27	2020	SE	FT	Data Engineer	720000	MXN	33511	MX	0	MX	S
28	2020	EN	CT	Business Data A	100000	USD	100000	US	100	US	L
29	2020	SE	FT	Machine Learni	157000	CAD	117104	CA	50	CA	L

DATASET DESCRIPTION

Dataset

Global Data Science Salary Dataset

Dataset Size

607 Rows, 11 Columns

Goals

This project provides insights into how data-related salaries are structured globally, enabling companies to design more effective recruitment strategies while helping job seekers understand career potential and appropriate compensation standards

DATASET **DESCRIPTION**

- **work_year** → Year of salary payment
- **experience_level** → Level of experience in the job during that year (EN = Entry-level/Junior, MI = Mid-level/Intermediate, SE = Senior-level/Expert, EX = Executive-level/Director)
- **employment_type** → Type of employment (PT = Part-time, FT = Full-time, CT = Contract, FL = Freelance)
- **job_title** → Position/role during that year
- **salary** → Total gross salary received
- **salary_currency** → Currency (ISO 4217 code)
- **salary_in_usd** → Salary in USD (converted using average yearly FX rate)
- **employee_residence** → Employee's primary residence (country, ISO 3166 code)
- **remote_ratio** → Remote work ratio (0 = No remote/<20%, 50 = Partially remote, 100 = Fully remote/>80%)
- **company_location** → Company's country (main office/contracting branch, ISO 3166 code)
- **company_size** → Average company size that year (S = Small <50 employees, M = Medium 50–250 employees, L = Large >250 employees)

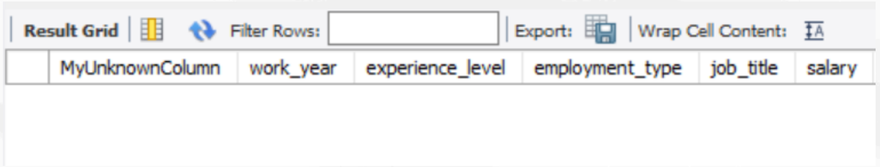
ANALYSIS USING SQL

1. CHECK IF THERE IS ANY NULL DATA

QUERY

```
select * from ds_salaries
where work_year is null
    or experience_level is null
    or employment_type is null
    or job_title is null
    or salary is null
    or salary_currency is null
    or salary_in_usd is null
    or employee_residence is null
    or remote_ratio is null
    or company_location is null
    or company_size is null;
```

RESULT



This query checks for NULL values across all columns in the dataset. The result shows no NULL values were found, confirming complete data integrity. All records contain valid entries for every field, ensuring reliable and comprehensive analysis without missing data concerns.

ANALYSIS USING SQL

2. CHECK WHAT JOB TITLES ARE AVAILABLE

QUERY

```
select distinct job_title
from ds_salaries
order by job_title;
```

RESULT

job_title
3D Computer Vision Researcher
AI Scientist
Analytics Engineer
Applied Data Scientist
Applied Machine Learning Scientist
BI Data Analyst
Big Data Architect
Big Data Engineer
Business Data Analyst
Cloud Data Engineer
Computer Vision Engineer
Computer Vision Software Engineer
Data Analyst
Data Analytics Engineer
Data Analytics Lead
Data Analytics Manager
Data Architect
Data Engineer
Data Engineering Manager

job_title
Data Science Consultant
Data Science Engineer
Data Science Manager
Data Scientist
Data Specialist
Director of Data Engineering
Director of Data Science
ETL Developer
Finance Data Analyst
Financial Data Analyst
Head of Data
Head of Data Science
Head of Machine Learning
Lead Data Analyst
Lead Data Engineer
Lead Data Scientist
Lead Machine Learning Engineer
Machine Learning Developer
Machine Learning Engineer

job_title
Head of Machine Learning
Lead Data Analyst
Lead Data Engineer
Lead Data Scientist
Lead Machine Learning Engineer
Machine Learning Developer
Machine Learning Engineer
Machine Learning Infrastructure ...
Machine Learning Manager
Machine Learning Scientist
Marketing Data Analyst
ML Engineer
NLP Engineer
Principal Data Analyst
Principal Data Engineer
Principal Data Scientist
Product Data Analyst
Research Scientist
Staff Data Scientist

This query retrieves all unique job titles from the ds_salaries table and displays them in alphabetical order. The DISTINCT keyword eliminates duplicate entries, while ORDER BY sorts the results alphabetically, making it easy to see the variety of data roles available in the dataset.

The results reveal 50+ distinct data and AI positions, from general roles (Data Analyst, Data Scientist) to specialized ones (NLP Engineer, Computer Vision Researcher), spanning all seniority levels and various business functions.

ANALYSIS USING SQL

3. WHAT JOB TITLES ARE RELATED TO DATA ANALYST

QUERY

```
select distinct job_title
from ds_salaries
where job_title like '%Data Analyst%'
order by job_title;
```

RESULT

job_title
BI Data Analyst
Business Data Analyst
Data Analyst
Finance Data Analyst
Financial Data Analyst
Lead Data Analyst
Marketing Data Analyst
Principal Data Analyst
Product Data Analyst

This query retrieves all unique job titles containing the term "Data Analyst" from the dataset and sorts them alphabetically. The LIKE operator with wildcards (%) searches for any job title that includes "Data Analyst" anywhere in the name, such as Senior Data Analyst, Marketing Data Analyst, or Lead Data Analyst.

The results show Data Analyst roles span multiple specializations (Business, Finance, Marketing, Product, BI), reflecting that analytical needs are highly contextual to each business function. The inclusion of Lead and Principal levels indicates a mature career trajectory with advancement opportunities into strategic positions.

ANALYSIS USING SQL

4. WHAT IS THE AVERAGE MONTHLY SALARY FOR ANALYST JOB?

QUERY

```
select
    job_title,
    experience_level,
    round(avg(salary_in_usd * 15000)/12,2) as avg_monthly_salary_in_rupiah
from ds_salaries
where job_title like '%Analyst%' or job_title like '%Analytics%'
group by job_title, experience_level
order by avg_monthly_salary_in_rupiah;
```

RESULT

job_title	experience_level	avg_monthly_salary_in_rupiah
Product Data Analyst	MI	16295000.00
Data Analytics Engineer	EN	25000000.00
BI Data Analyst	EN	40170000.00
Lead Data Analyst	MI	66630625.00
Data Analyst	EN	67450833.33
Finance Data Analyst	SE	77370000.00
Data Analytics Engineer	SE	80748125.00
Data Analyst	MI	89624008.62
Business Data Analyst	MI	93480833.33
Principal Data Analyst	MI	93750000.00
BI Data Analyst	MI	97607916.67
Business Data Analyst	EN	99438750.00
Marketing Data Analyst	SE	110817500.00
Financial Data Analyst	EN	125000000.00
Data Analytics Engineer	MI	137500000.00
Data Analyst	SE	139903287.04
Data Analyst	EX	150000000.00

job_title	experience_level	avg_monthly_salary_in_rupi
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Data Analyst	SE	139903287.04
Data Analyst	EX	150000000.00
Data Analytics Manager	SE	158917857.14
BI Data Analyst	EX	187500000.00
Analytics Engineer	EX	193750000.00
Lead Data Analyst	SE	212500000.00
Principal Data Analyst	SE	212500000.00
Analytics Engineer	SE	243750000.00
Data Analytics Lead	SE	506250000.00
Financial Data Analyst	MI	562500000.00

This query calculates the average monthly salary in Indonesian Rupiah for positions containing "Analyst" or "Analytics" in their job title, broken down by experience level. It converts annual USD salaries to IDR using an exchange rate of 15,000, divides by 12 for monthly amounts, rounds to two decimal places, and displays results sorted from lowest to highest salary.

ANALYSIS USING SQL

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RESULT

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Data Analytics Lead	SE	506250000.00
Financial Data Analyst	MI	562500000.00

Entry-level (EN) analysts earn the lowest average monthly salaries, generally below IDR 40 million, while mid-level (MI) analysts experience a significant increase, with salaries mostly ranging between IDR 65–100 million. Senior-level (SE) analysts earn substantially higher salaries, often exceeding IDR 100 million due to their advanced expertise and leadership responsibilities. At the executive level (EX), salaries peak at around IDR 150–190 million per month, reflecting strategic roles with high decision-making authority. Overall, experience level strongly influences analyst compensation, with seniority and role complexity driving higher pay

ANALYSIS USING SQL

5. COUNTRIES WITH ATTRACTIVE SALARIES FOR DATA ANALYSTS, FULL TIME, AND EXPERIENCE LEVELS ENTRY LEVEL (EN) AND MEDIUM (MI)

QUERY

```
select
    company_location,
    round(avg(salary_in_usd *15000)/12,2) as avg_salary
from ds_salaries
where job_title like '%Analyst%' and employment_type = 'FT' and experience_level in ('MI','EN')
group by company_location
having round(avg(salary_in_usd *15000)/12,2) > 50000000
order by avg_salary desc;
```

RESULT

company_location	avg_salary
US	126746508.62
CA	88523333.33
LU	73877500.00
FR	66163125.00
GB	63594500.00

This query identifies countries with average monthly salaries above Rp 50 million for full-time analyst roles at Entry and Mid-level. Results are grouped by company location and sorted from highest to lowest salary.

The output shows five countries offering the highest average monthly salaries for Entry and Mid-level full-time analyst positions. The United States leads with Rp 126.7 million per month, followed by Canada at Rp 88.5 million, Luxembourg at Rp 73.8 million, France at Rp 66.1 million, and Great Britain at Rp 63.5 million. All these countries exceed the Rp 50 million threshold, representing the most lucrative markets for junior to intermediate-level data analysts.

ANALYSIS USING SQL

6. IN WHICH YEAR DOES THE SALARY INCREASE FROM MID TO EX HAVE THE HIGHEST RAISE FOR FULL-TIME POSITIONS RELATED TO DATA ANALYSIS?

QUERY

```sql
with ds_1 as (
    select
        work_year,
        round(avg(salary_in_usd * 15000)/12,2) as avg_salary_ex_IDR
    from ds_salaries
    where employment_type = 'FT'
        and experience_level = 'EX'
        and job_title like '%Data Analyst%'
    group by work_year
),
ds_2 as (
    select
        work_year,
        round(avg(salary_in_usd * 15000)/12,2) as avg_salary_mid_IDR
    from ds_salaries
    where employment_type = 'FT'
        and experience_level = 'MI'
          and job_title like '%Data Analyst%'
      group by work_year
), t_year as (
    select distinct work_year
    from ds_salaries
)
  select
      y.work_year,
      d1.avg_salary_ex_IDR,
      d2.avg_salary_mid_IDR,
      round((d1.avg_salary_ex_IDR - d2.avg_salary_mid_IDR),2) as differences
  from t_year y
  left join ds_1 d1 on y.work_year = d1.work_year
  left join ds_2 d2 on y.work_year = d2.work_year;
```

This query uses Common Table Expressions (CTEs) to analyze salary differences between Executive and Mid-level data analysts in full-time positions. The first CTE (ds_1) calculates average monthly Executive salaries in Rupiah per year, the second CTE (ds_2) does the same for Mid-level positions, and the third CTE (t_year) extracts all distinct years. The main query joins these CTEs to display the year, Executive salary, Mid-level salary, and the salary gap between them, helping identify which year had the largest compensation increase from Mid to Executive level.

ANALYSIS USING SQL

6. IN WHICH YEAR DOES THE SALARY INCREASE FROM MID TO EX HAVE THE HIGHEST RAISE FOR FULL-TIME POSITIONS RELATED TO DATA ANALYSIS?

RESULT

work_year	avg_salary_ex_IDR	avg_salary_mid_IDR	differences
2020	NULL	75911093.75	NULL
2021	187500000.00	135498522.73	52001477.27
2022	150000000.00	86213238.64	63786761.36

The output shows the salary gap between Senior and Mid-level data analysts across three years. In 2020, there's no Senior-level salary data available (NULL), so no comparison can be made. In 2021, Senior analysts earned Rp 187.5 million monthly compared to Mid-level's Rp 135.4 million, creating a difference of Rp 52 million. The largest salary increase occurred in 2022, where Senior-level positions earned Rp 150 million versus Mid-level's Rp 86.2 million, resulting in the highest gap of Rp 63.7 million. This indicates that 2022 offered the most significant salary progression from Mid to Senior level for full-time data analyst positions.

CONCLUSIONS

- Specialized Career Landscape: Over 50 distinct data roles exist, with Data Analyst positions specialized by domain (Finance, Marketing, Product, BI), showing analytical work is context-driven.
- Strong Experience-Salary Correlation: Clear progression exists: Entry-level (<IDR 40M/month) → Mid-level (IDR 65-100M) → Senior (>IDR 100M) → Executive (IDR 150-190M).
- Geographic Premium: US leads at IDR 126.7M monthly for Entry/Mid-level—50% higher than Canada. Western markets dominate high-salary positions.
- Growing Senior Premium: Mid-to-Senior gap increased 22% from IDR 52M (2021) to IDR 63.7M (2022), reflecting rising demand for senior expertise.

SUGGESTIONS

For Job Seekers

- Specialize in business domains (Finance, Marketing, Product) for higher compensation
- Target US, Canada, or Luxembourg markets for maximum earning potential
- Prioritize Mid-to-Senior progression—largest salary jump at IDR 63.7M monthly
- Combine technical analytics skills with business domain knowledge

For Employers

- Offer remote flexibility or enhanced benefits to compete with top-tier markets
- Build clear career pathways with leadership development to retain mid-level talent
- Create specialized analyst roles aligned with business functions
- Conduct annual salary benchmarking given 22% year-over-year premium increases

For Workforce Development

- Focus training on Entry-to-Mid (60-85% increase) and Mid-to-Senior (50-75% increase) transitions
- Develop hybrid hiring strategies combining local talent with high-skill market hires
- Prepare for continued specialization in emerging areas (NLP, Computer Vision, ML Engineering)

LET'S CONNECT

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THANK YOU