**SQL Case Study on Workforce Income Analysis**

**Introduction**

The Workforce Income Analysis project aims to provide insights into salary trends and workforce dynamics based on various factors such as company size, job title, experience level, and geographical location. By querying a database with employee salary data, the project helps analyse different aspects of the labour market, offering valuable information for decision-making in workforce management, compensation planning, and career development.

**Task 1**

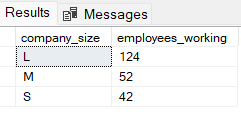
**Investigating the job market based on company size in 2021:**

**Task: You need to count how many employees are working in different companies, categorized by size (S, M, L).**

select company\_size, count(\*) as employees\_working from salaries

where work\_year = 2021

group by company\_size



**Task 2**

**Top 3 job titles with the highest average salary for part-time positions in 2023:**

**Task: Identify the highest-paying job titles for part-time positions while ensuring you only include countries with more than 50 employees.**

select top 3 job\_title, AVG(salary) as avg\_salary, count(\*) as employee\_count from salaries

where employment\_type = 'PT' and

company\_location in (select company\_location from salaries group by company\_location having count(\*) > 50 )

group by job\_title

order by avg\_salary desc

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**task 3**

Countries where mid-level salary is higher than the overall mid level salary in 2023:

Task: Identify countries where the average salary for mid-level employees (MI) is greater than the overall average for that level.

select company\_location, round(AVG(salary),1) as avg\_salary from salaries

where experience\_level = 'MI'

group by company\_location

having AVG(salary) > (select avg(salary) from salaries)

order by avg\_salary desc

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**task 4**

**Highest and lowest average salary locations for senior-level employees in 2023:**

**Task: Identify which countries pay seniorlevel (SE) employees the highest and lowest average salaries.**

with salaryLocation as(

select company\_location, avg(salary\_in\_usd) as avg\_salary from salaries where experience\_level = 'SE' and work\_year = 2023 group by company\_location

)

select company\_location, avg\_salary from salaryLocation

where avg\_salary = (select MIN(avg\_salary) from salaryLocation) or avg\_salary = (select MAX(avg\_salary) from salaryLocation) ;

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**Task 5**

**Salary growth rates by job title: Task: Calculate the percentage increase in salaries for various job titles between two years (e.g., 2023 and 2024).**

WITH salaryComparison AS (

select s1.job\_title,

avg( s1.salary\_in\_usd) AS salary\_2023,

avg(s2.salary\_in\_usd) AS salary\_2024

from salaries s1

JOIN salaries s2 ON s1.job\_title = s2.job\_title

WHERE s1.work\_year = 2023 and s2.work\_year = 2024

group by s1.job\_title

)

select job\_title,salary\_2023,salary\_2024,

ROUND(((salary\_2024 - salary\_2023) / salary\_2023) \* 100, 2) AS salary\_growth\_percentage

from salaryComparison;

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**task 6**

**Top three countries with the highest salary growth for entrylevel roles from 2020 to 2023:**

with salarycomparison as (

select company\_location,

avg(case when work\_year = 2020 then salary\_in\_usd end) as salary\_2020,

avg(case when work\_year = 2023 then salary\_in\_usd end) as salary\_2023,

count(\*) as employee\_count

from salaries where experience\_level = 'EN' and (work\_year = 2020 or work\_year = 2023)

group by company\_location

having count(\*) > 50

)

select top 3 company\_location, salary\_2020, salary\_2023,

round(((salary\_2023 - salary\_2020) / salary\_2020) \* 100, 2) as salary\_growth\_percentage

from salarycomparison

order by salary\_growth\_percentage desc;

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**Task 7**

**Updating remote work ratio for employees earning more than $90,000 in the US and AU:**

**Task: Update the remote\_ratio for employees based on their salary and location.**

update salaries

set remote\_ratio = 100

where salary\_in\_usd > 90000

and employee\_residence in ('US', 'AU');

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**Task 8**

**Salary updates based on percentage increases by level in 2024:**

**Task: Update the salaries for various experience levels (SE, MI, etc.) according to predefined percentage increases.**

update salaries

set salary\_in\_usd = salary\_in\_usd \*

case

when experience\_level = 'SE' then 1.22

when experience\_level = 'MI' then 1.30

when experience\_level = 'EN' then 1.15

when experience\_level = 'EX' then 1.10

else salary\_in\_usd no change for other levels

end

where work\_year = 2024;

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**Task 9**

**Year with the highest average salary for each job title:**

**Task: Identify which year had the highest average salary for each job title.**

with avg\_salary\_per\_year as (

select job\_title,work\_year,

avg(salary\_in\_usd) as avg\_salary

from salaries

group by job\_title, work\_year

)

select a.job\_title,a.work\_year,a.avg\_salary

from avg\_salary\_per\_year a

inner join (

select job\_title,max(avg\_salary) as max\_avg\_salary from avg\_salary\_per\_year group by job\_title

) b on a.job\_title = b.job\_title and a.avg\_salary = b.max\_avg\_salary;

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**task 10**

**Percentage of employment types for different job titles:**

**Task: Calculate the percentage of full-time and part-time employees for each job title.**

with employment\_counts as (

select job\_title, employment\_type, count(\*) as employee\_count

from salaries

group by job\_title, employment\_type

)

select job\_title,

round(

(cast(sum(case when employment\_type = 'FT' then employee\_count else 0 end) as float) \* 100.0) /

sum(employee\_count),

2) as full\_time\_percentage,

round(

(cast(sum(case when employment\_type = 'PT' then employee\_count else 0 end) as float)\* 100.0) /

sum(employee\_count),

2) as part\_time\_percentage

from employment\_counts

group by job\_title;

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**task 11**

**COUNTRIES OFFERING FULL REMOTE WORK FOR MANAGERS WITH SALARIES OVER $90,000:**

**TASK: FIND COUNTRIES WHERE MANAGERS EARN MORE THAN $90,000 AND WORK FULLY REMOTELY.**

select employee\_residence, count(\*) as manager\_count

from salaries

where job\_title like '%Manager%' and salary\_in\_usd > 90000 and remote\_ratio = 100

group by employee\_residence

order by manager\_count desc;

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**task 12**

**Top 5 countries with the largest companies:**

**Task: Identify which countries have the highest number of large companies.**

select top 5 company\_location, count(\*) as large\_company\_count

from salaries

where company\_size = 'L'

group by company\_location

order by large\_company\_count desc;

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**task 13**

**Percentage of employees with fully remote roles earning more than $100,000:**

**Task: Calculate the percentage of fully remote employees earning more than $100,000.**

select round(

(cast(count(case when remote\_ratio = 100 and salary\_in\_usd > 100000 then 1 end) as float) \* 100) / cast(count(\*) as float), 2

) as percentage\_remote\_over\_100k

from salaries;

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**task 14**

**Locations where entry-level average salaries exceed market average for entry level:**

**Task: Identify locations where entrylevel salaries surpass the market average.**

with market\_avg as (

select avg(salary\_in\_usd) as market\_average

from salaries

where experience\_level = 'EN'

),

location\_avg as (

select company\_location,avg(salary\_in\_usd) as location\_average

from salaries

where experience\_level = 'EN'

group by company\_location

)

select la.company\_location, la.location\_average

from location\_avg la

join market\_avg ma on la.location\_average > ma.market\_average;

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**task 15**

**Countries paying the maximum average salary for each job title:**

**Task: For each job title, identify which country pays the highest average salary.**

with job\_title\_avg as (

select job\_title, employee\_residence, round(avg(salary\_in\_usd),2) as avg\_salary

from salaries

group by job\_title, employee\_residence

)

select job\_title, employee\_residence, avg\_salary

from job\_title\_avg j1

where avg\_salary = (select max(avg\_salary) from job\_title\_avg j2 where j2.job\_title = j1.job\_title);

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**task 16**

**Countries with sustained salary growth over three years:**

**Task: Identify countries with consistent salary growth over the past three years.**

with yearly\_avg\_salaries as (

select employee\_residence, work\_year, ROUND( avg(salary\_in\_usd),2) as avg\_salary

from salaries

where work\_year in (2021, 2022, 2023)

group by employee\_residence, work\_year

),

salary\_growth as (

select a.employee\_residence, a.avg\_salary as salary\_2021, b.avg\_salary as salary\_2022, c.avg\_salary as salary\_2023

from yearly\_avg\_salaries a

join yearly\_avg\_salaries b on a.employee\_residence = b.employee\_residence and a.work\_year = 2021 and b.work\_year = 2022

join yearly\_avg\_salaries c on a.employee\_residence = c.employee\_residence and a.work\_year = 2021 and c.work\_year = 2023

)

select employee\_residence, salary\_2021, salary\_2022, salary\_2023 from salary\_growth

where salary\_2022 > salary\_2021 and salary\_2023 > salary\_2022;

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**task 17**

**PERCENTAGE OF FULLY REMOTE WORK BY EXPERIENCE LEVEL (2021 VS 2024):**

**TASK: COMPARE THE ADOPTION OF FULLY REMOTE WORK ACROSS EXPERIENCE LEVELS BETWEEN 2021 AND 2024.**

with remote\_percentage as (

select experience\_level, work\_year,

round(cast(count(case when remote\_ratio = 100 then 1 end) as float) / count(\*) \* 100,2) as remote\_percentage

from salaries

where work\_year in (2021, 2024)

group by experience\_level, work\_year

)

select experience\_level,

max(case when work\_year = 2021 then remote\_percentage end) as remote\_percentage\_2021,

max(case when work\_year = 2024 then remote\_percentage end) as remote\_percentage\_2024

from remote\_percentage

group by experience\_level;

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**task 18**

**Average salary increase percentage by experience level and job title (2023 to 2024):**

**Task: Calculate the average salary increase for each experience level and job title.**

with salary\_increase as (

select a.experience\_level, a.job\_title, a.salary\_in\_usd as salary\_2023, b.salary\_in\_usd as salary\_2024,

cast((b.salary\_in\_usd - a.salary\_in\_usd) as float) / a.salary\_in\_usd \* 100 as salary\_increase\_percentage

from salaries a

join salaries b on a.experience\_level = b.experience\_level and a.job\_title = b.job\_title and a.work\_year = 2023 and b.work\_year = 2024

)

select experience\_level, job\_title, round(avg(salary\_increase\_percentage),2) as avg\_salary\_increase\_percentage

from salary\_increase

group by experience\_level, job\_title

order by avg\_salary\_increase\_percentage desc;

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**task 19**

**Role-based access control for employees based on experience level:**

**Task: Implement security to restrict access based on an employee's experience level.**

**View for Entry-Level Employees (EL)**

create procedure get\_employee\_data\_by\_experience\_level

@user\_experience\_level varchar(5)

as

begin

select experience\_level, salary\_in\_usd, company\_location, work\_year,employment\_type, job\_title

from salaries

where experience\_level = @user\_experience\_level;

end;

exec get\_employee\_data\_by\_experience\_level 'MI';

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**task 20**

**Guiding clients in switching domains based on salary insights:**

**Task: Based on an employee's data (experience, job title, location), suggest new domains they can transition to, based on salary trends.**

with salary\_growth\_cte as (

select job\_title, company\_location, experience\_level ,

round(avg(case when work\_year = 2023 then salary\_in\_usd end),2) as salary\_2023,

round(avg(case when work\_year = 2024 then salary\_in\_usd end),2) as salary\_2024

from salaries

where work\_year in (2023, 2024)

group by job\_title, company\_location,experience\_level

)

select job\_title, company\_location,experience\_level, salary\_2023, salary\_2024,

round(((salary\_2024 - salary\_2023) / salary\_2023) \* 100,2) as salary\_growth\_percentage

from salary\_growth\_cte

where ((salary\_2024 - salary\_2023) / salary\_2023) \* 100 > 10

order by salary\_growth\_percentage desc;

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