

# Data Professionals' Salaries:

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## TRENDS AND PREDICTIONS

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<b>work_year</b>	The year the salary was paid.	<b>salary_in_usd</b>	The salary in USD (FX rate divided by avg. USD rate of the respective year) via statistical data from the BIS and central banks.
<b>experience_level</b>	The experience level in the job during the year with the following possible values: <b>EN</b> Entry-level / Junior <b>MI</b> Mid-level / Intermediate <b>SE</b> Senior-level / Expert <b>EX</b> Executive-level / Director	<b>employee_residence</b>	Employee’s primary country of residence in during the work year as an ISO 3166 country code.
<b>employment_type</b>	The type of employment for the role: <b>PT</b> Part-time <b>FT</b> Full-time <b>CT</b> Contract <b>FL</b> Freelance	<b>remote_ratio</b>	The overall amount of work done remotely, possible values are as follows: <b>0</b> No remote work (less than 20%) <b>50</b> Partially remote/hybrid <b>100</b> Fully remote (more than 80%)
<b>job_title</b>	The role worked during the year.	<b>company_location</b>	The country of the employer’s main office or contracting branch as an ISO 3166 country code.
<b>salary</b>	The total gross salary amount paid.	<b>company_size</b>	The average number of people that worked for the company during the year: <b>S</b> less than 50 employees (small) <b>M</b> 50 to 250 employees (medium) <b>L</b> more than 250 employees (large)
<b>salary_currency</b>	The currency of the salary paid as an ISO 4217 currency code.		

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# Research Questions:

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**1:**

**WHAT EFFECT DOES COMPANY SIZE HAVE ON DATA PROFESSIONALS' SALARIES?**

**2:**

**ON AVERAGE, WHAT SALARY INCREASES CAN BE EXPECTED WITH GROWTH IN EXPERIENCE LEVEL?**

**3:**

**WHAT TRENDS CAN BE SEEN IN DATA PROFESSIONALS' SALARIES OVER THE PAST 3 YEARS?**

**4:**

**WHAT IS THE AVERAGE SALARY FOR EACH JOB TITLE?**

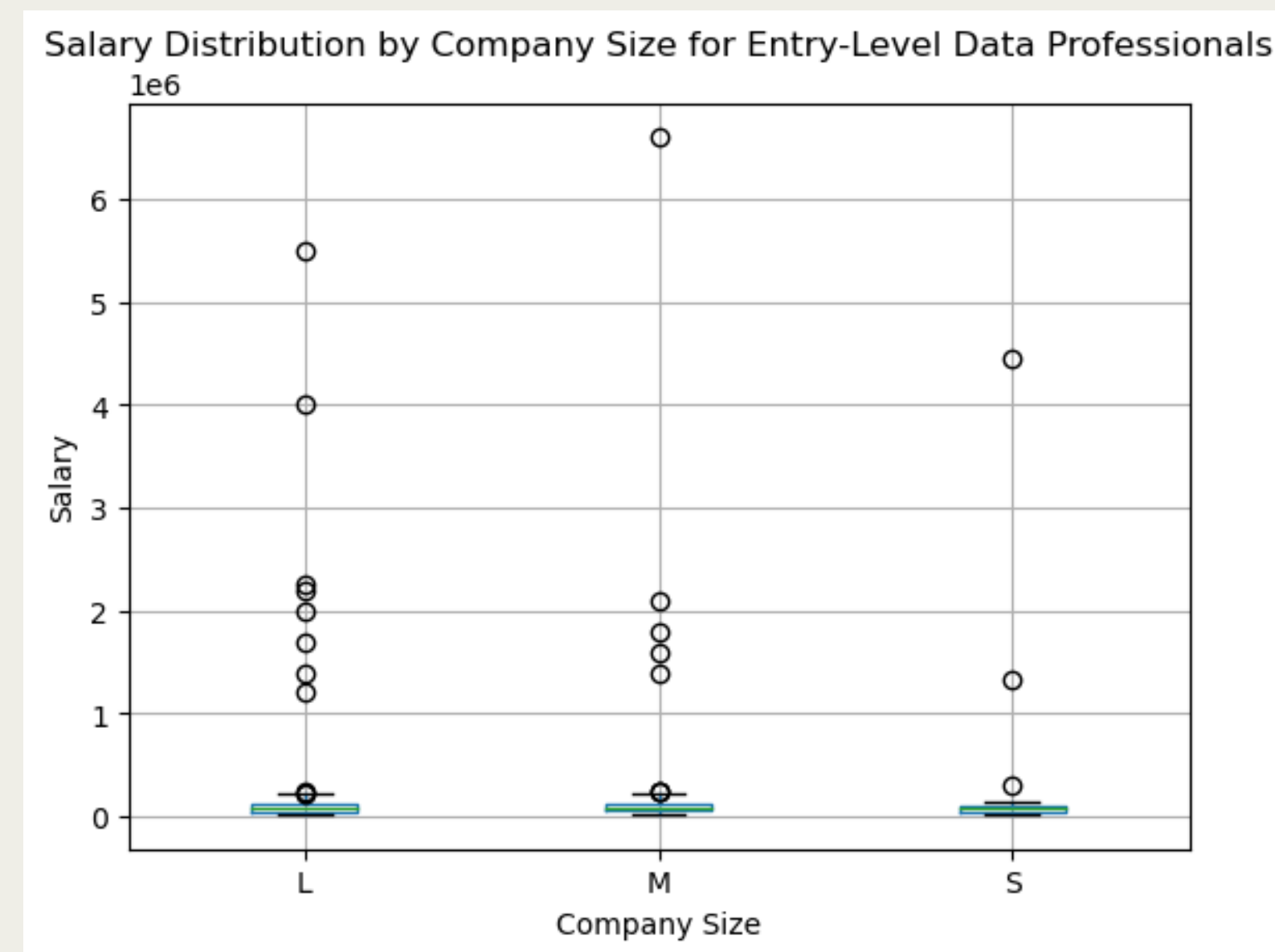
Before we do anything though...

# Let's talk limitations

- THE DATA REPRESENTED IS **SELF-REPORTED**
- WE HAVE MORE DATA RELEVANT TO THE YEARS **2022-23** THAN 2020-21
- DATA REPRESENTS THE OVERALL COMPENSATION/**GROSS SALARY AMOUNT** FOR THE WORKING YEAR (BEFORE DEDUCTIONS LIKE SOCIAL SECURITY, TAXES AND OTHER CONTRIBUTIONS), NOT INCLUDING EQUITY/STOCK OPTIONS OR SIMILAR BENEFITS.
- SOME **JOB TITLES** REPORTED MAY HAVE SIMILAR QUALIFICATIONS AND DUTIES BUT ARE LISTED UNDER A SEPARATE TITLE

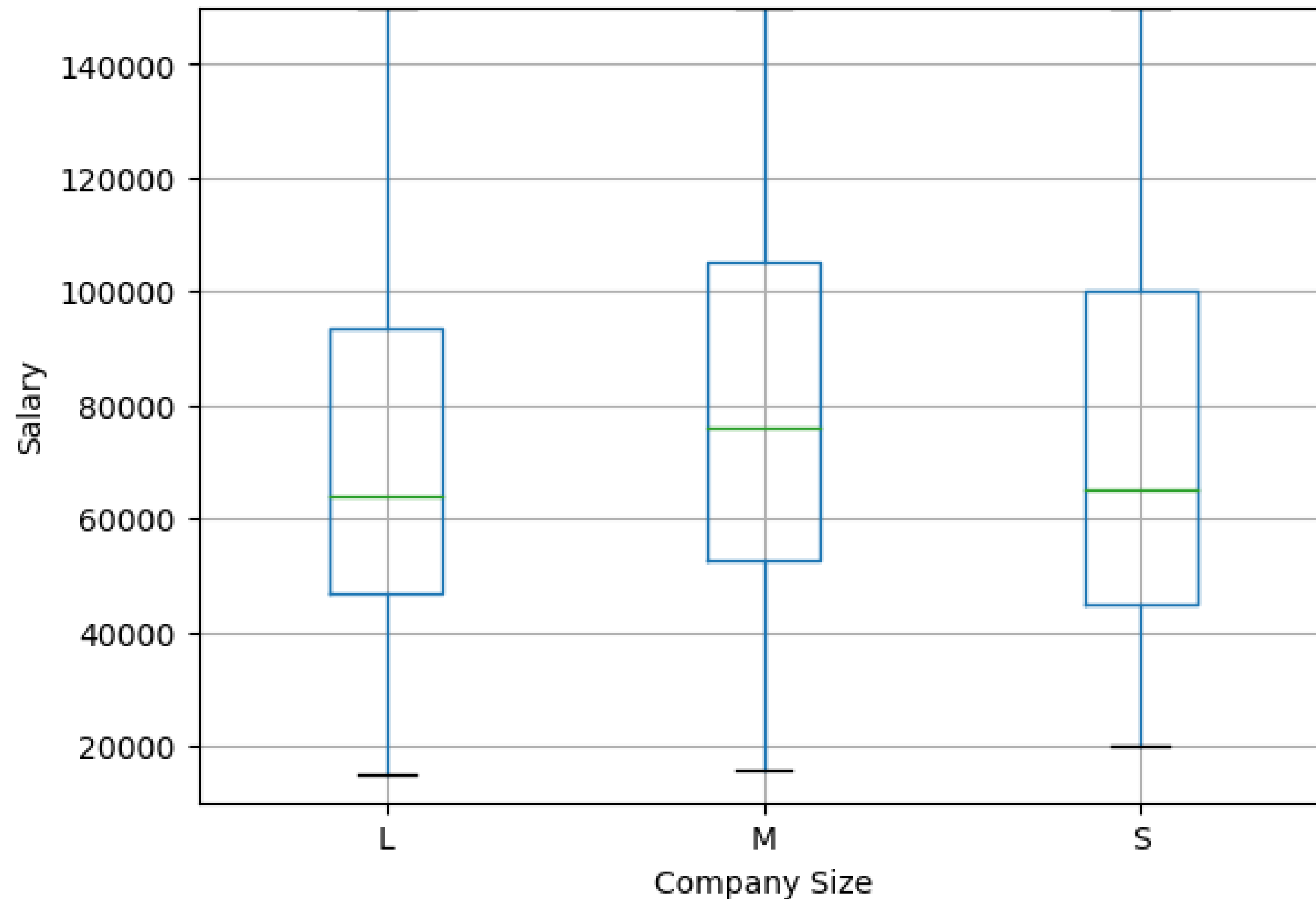
# Question 1:

WHAT EFFECT DOES COMPANY SIZE HAVE ON DATA  
PROFESSIONALS' SALARIES?

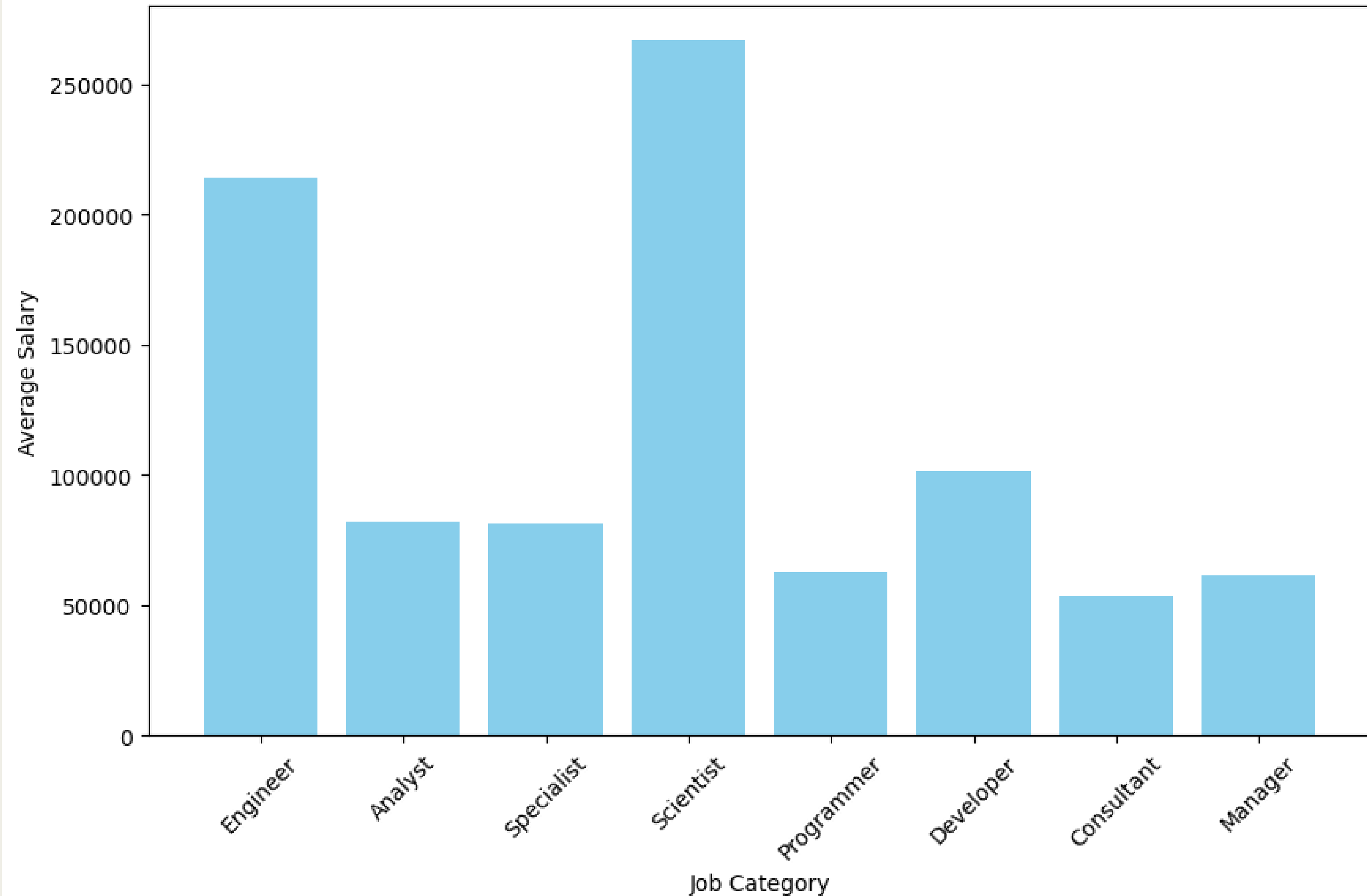


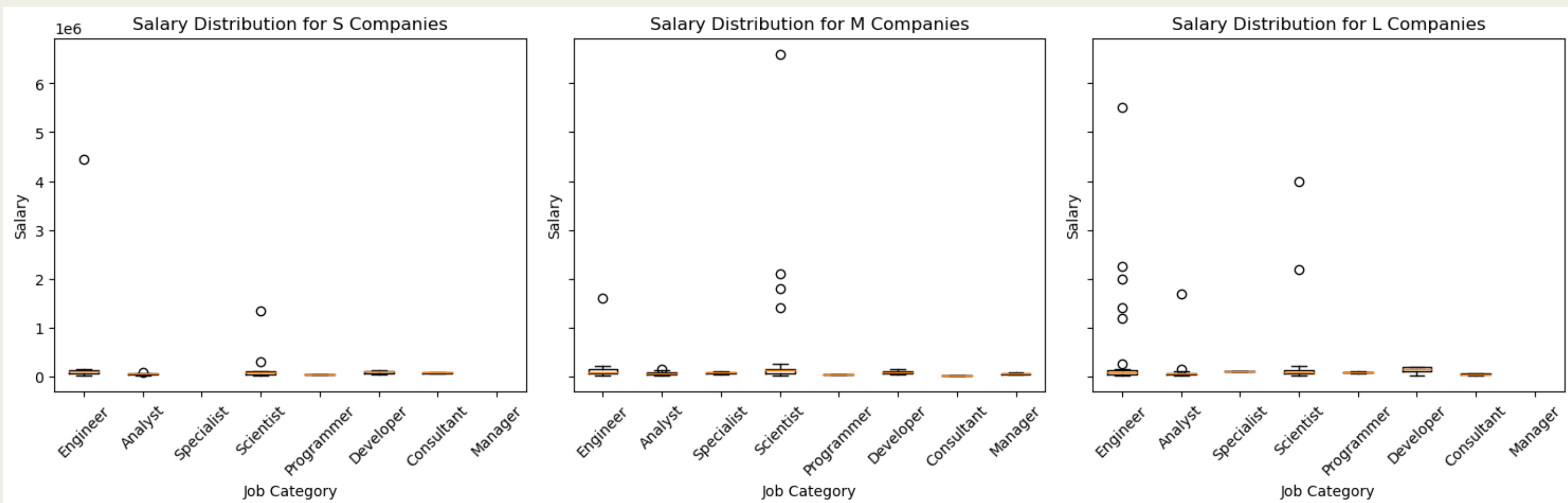
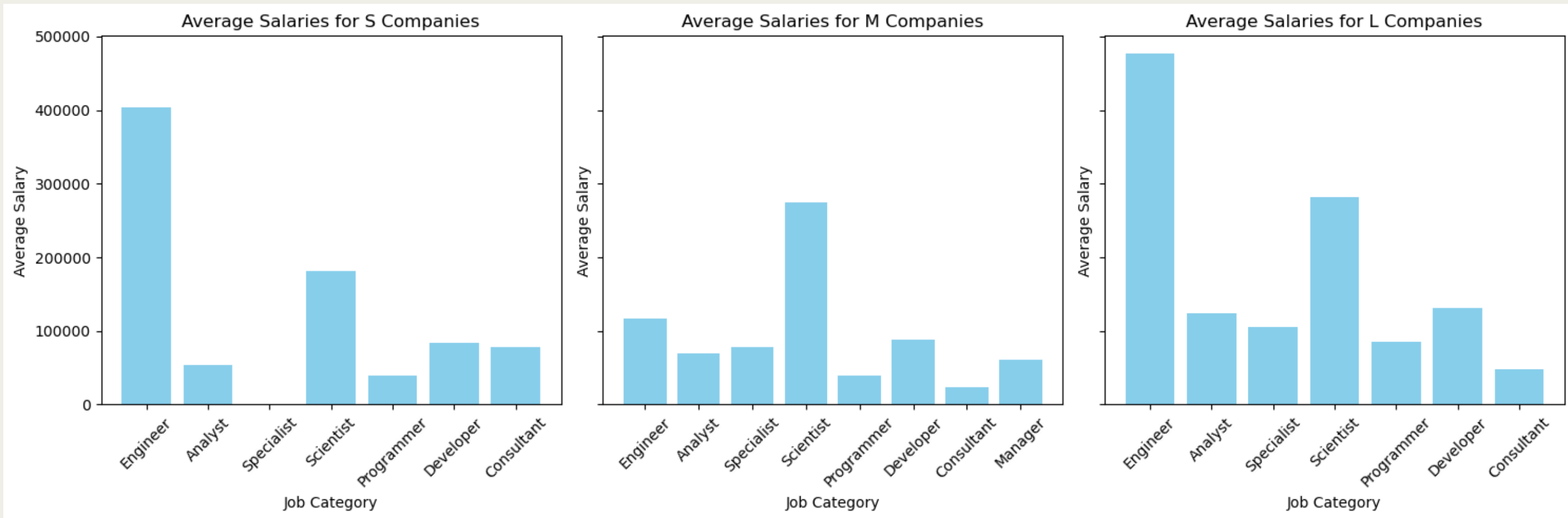


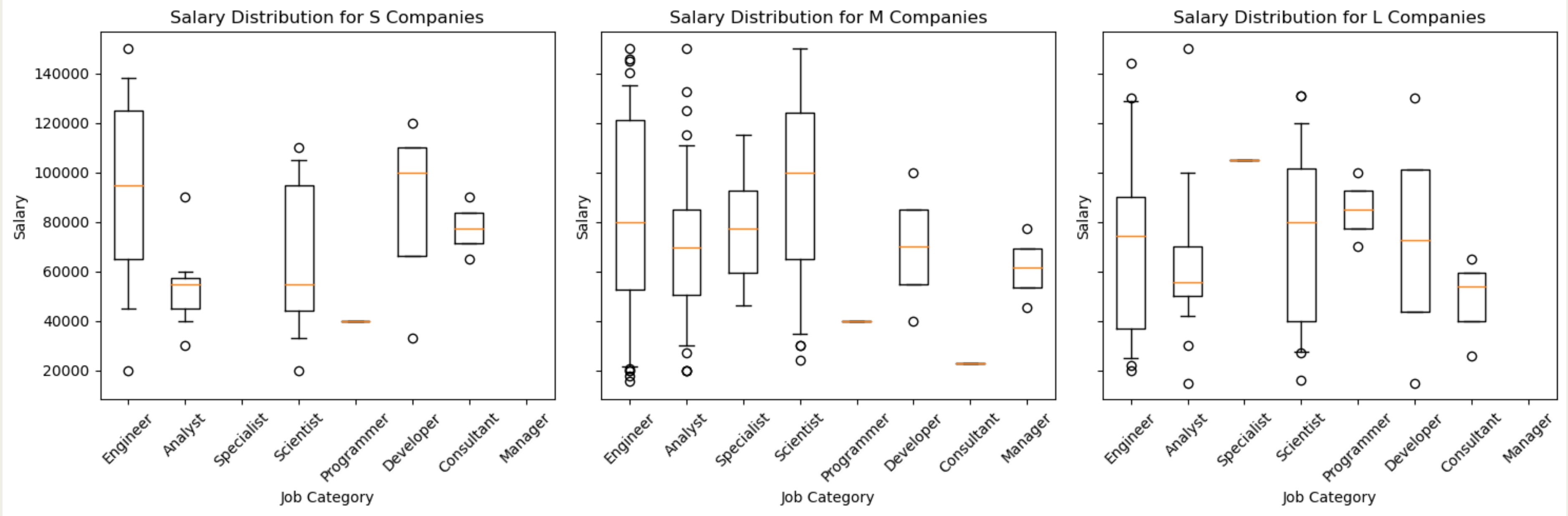
# Salary Distribution by Company Size for Entry-Level Data Professionals



Average Salaries by Job Category for Entry-Level Data Professionals







**WHAT EFFECT DOES COMPANY SIZE HAVE ON DATA  
PROFESSIONALS' SALARIES?**

# WHAT EFFECT DOES COMPANY SIZE HAVE ON DATA PROFESSIONALS' SALARIES?

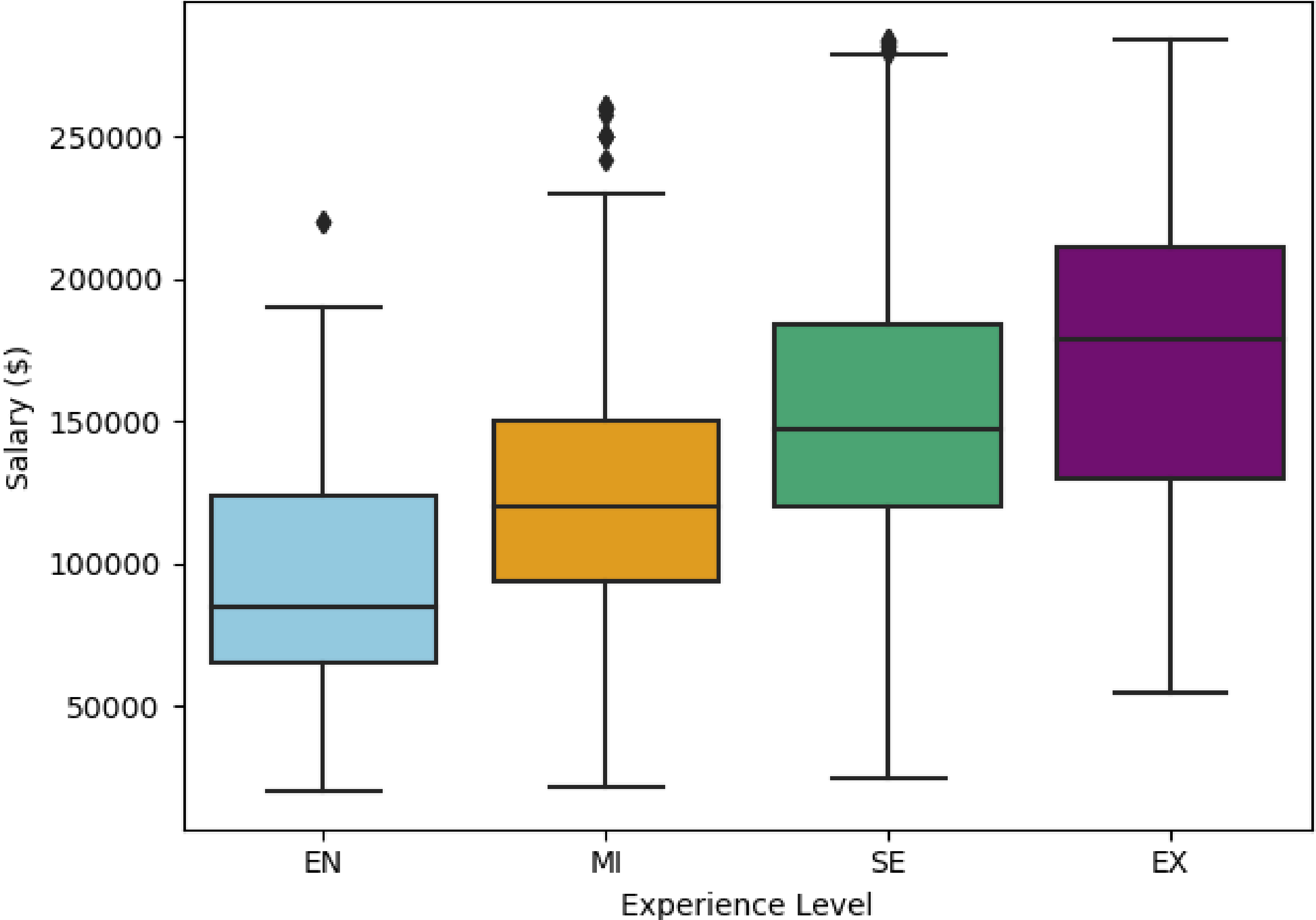
Very little effect.

There is not a significant difference in your salary as a data professional simply based on the decision to work for a Small, Medium, or Large company.

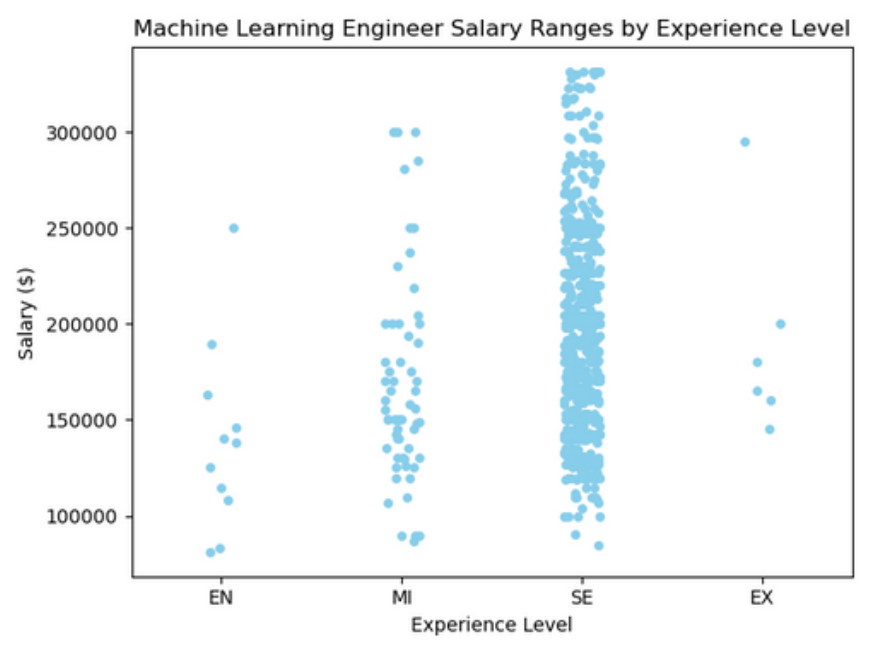
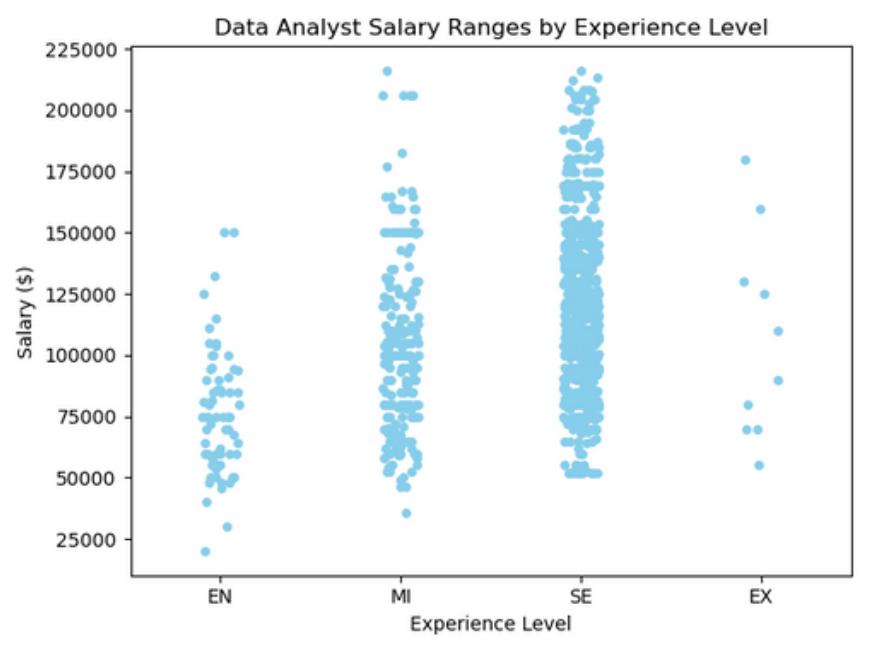
# Question 2:

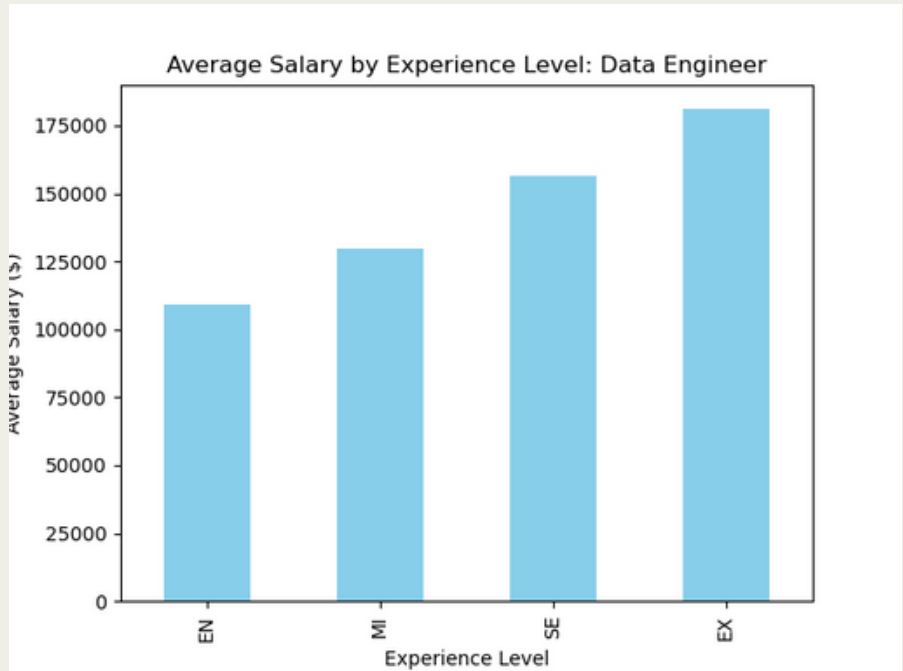
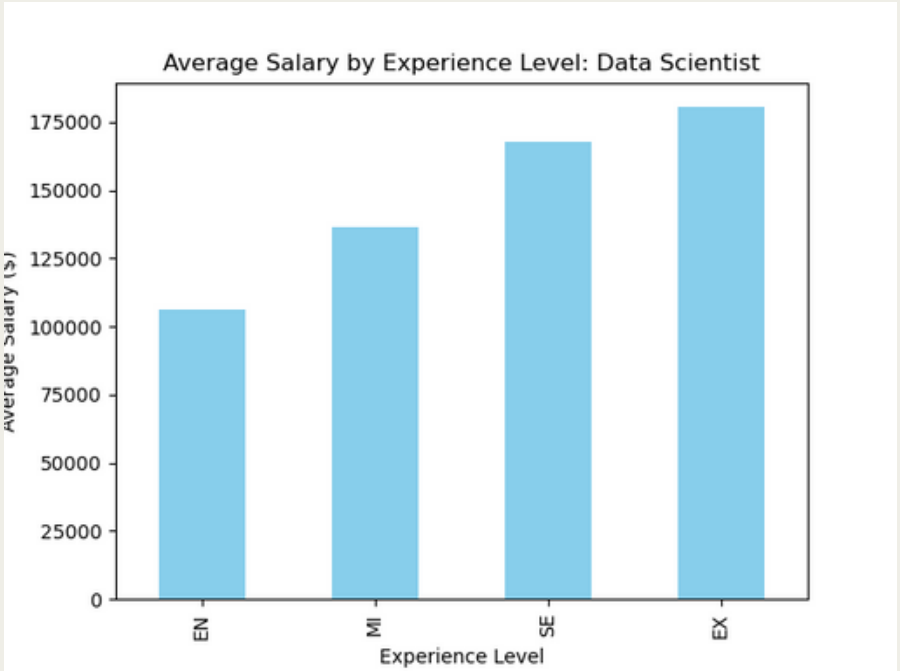
**ON AVERAGE, WHAT SALARY INCREASES CAN BE  
EXPECTED WITH GROWTH IN EXPERIENCE LEVEL?**

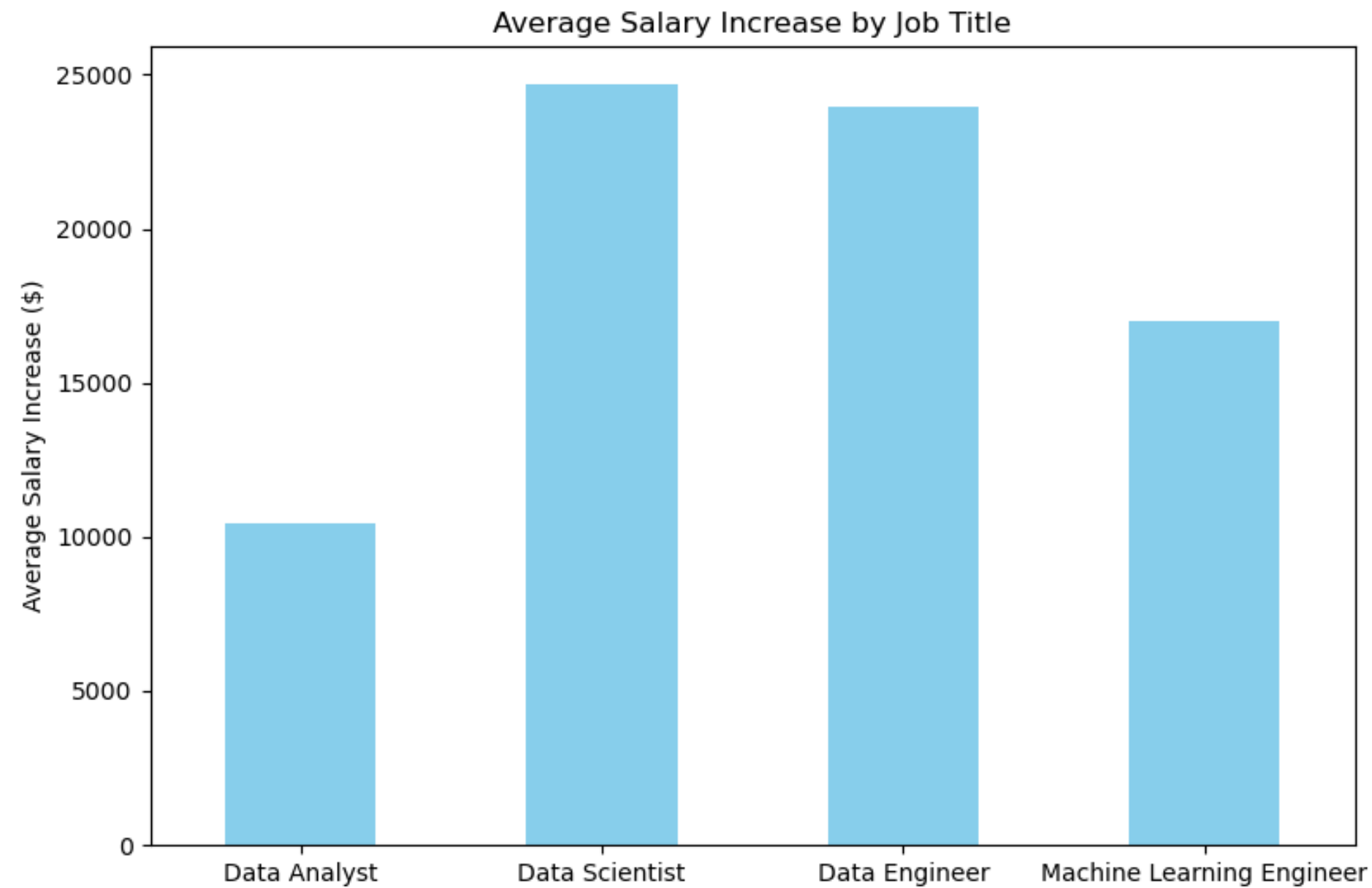
Distribution of Salary by Experience Level











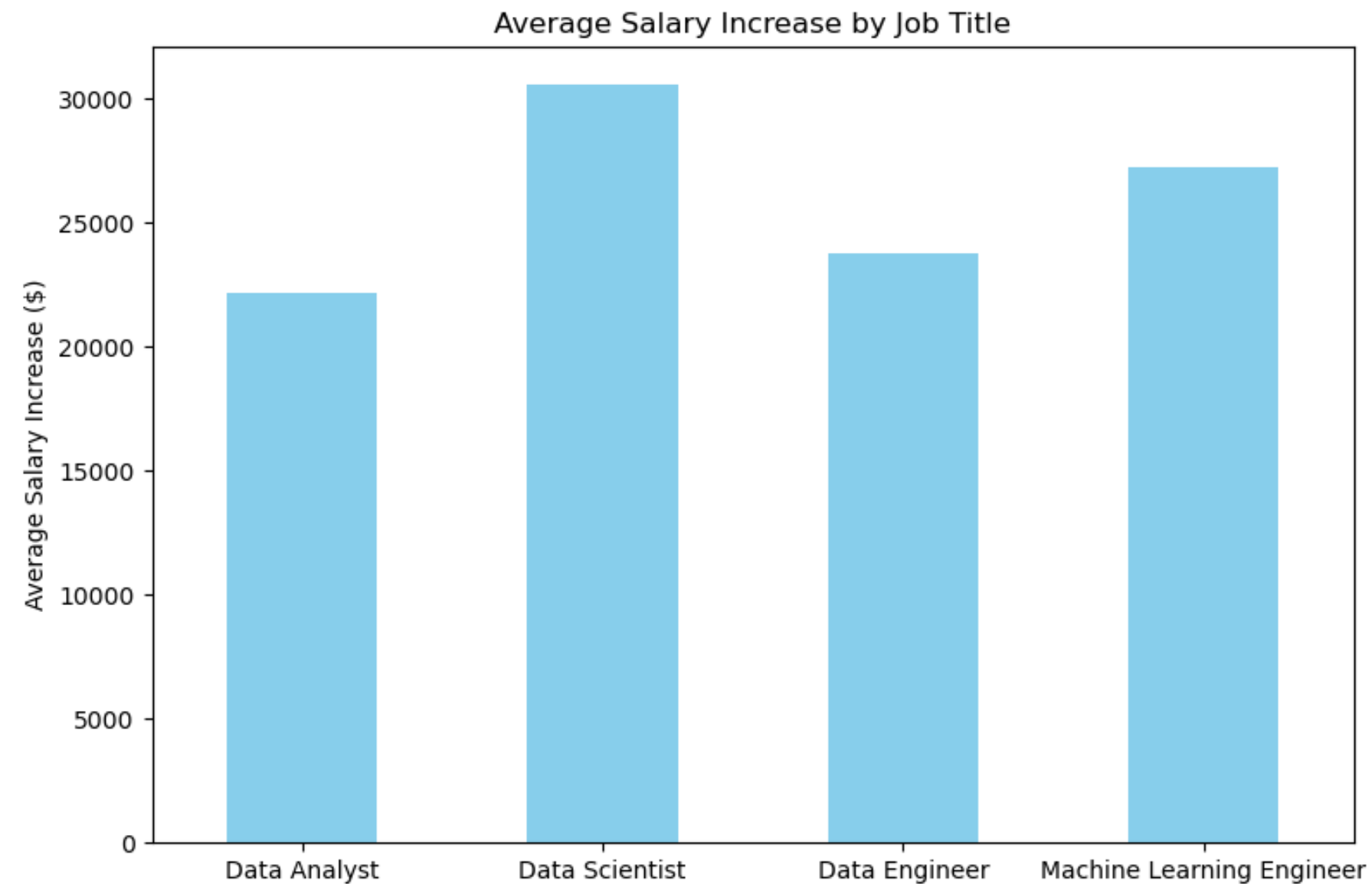
Data Analysts show an average salary increase of \$10,438.19.

Data Scientists show an average salary increase of \$24,688.64.

Data Engineers show an average salary increase of \$23,973.86.

Machine Learning Engineers show an average salary increase of \$17,011.18.

# WITHOUT EXECUTIVE LEVEL



Data Analysts show an average salary increase of \$22,156.58.

Data Scientists show an average salary increase of \$30,568.01.

Data Engineers show an average salary increase of \$23,789.43.

Machine Learning Engineers show an average salary increase of \$27,200.56.

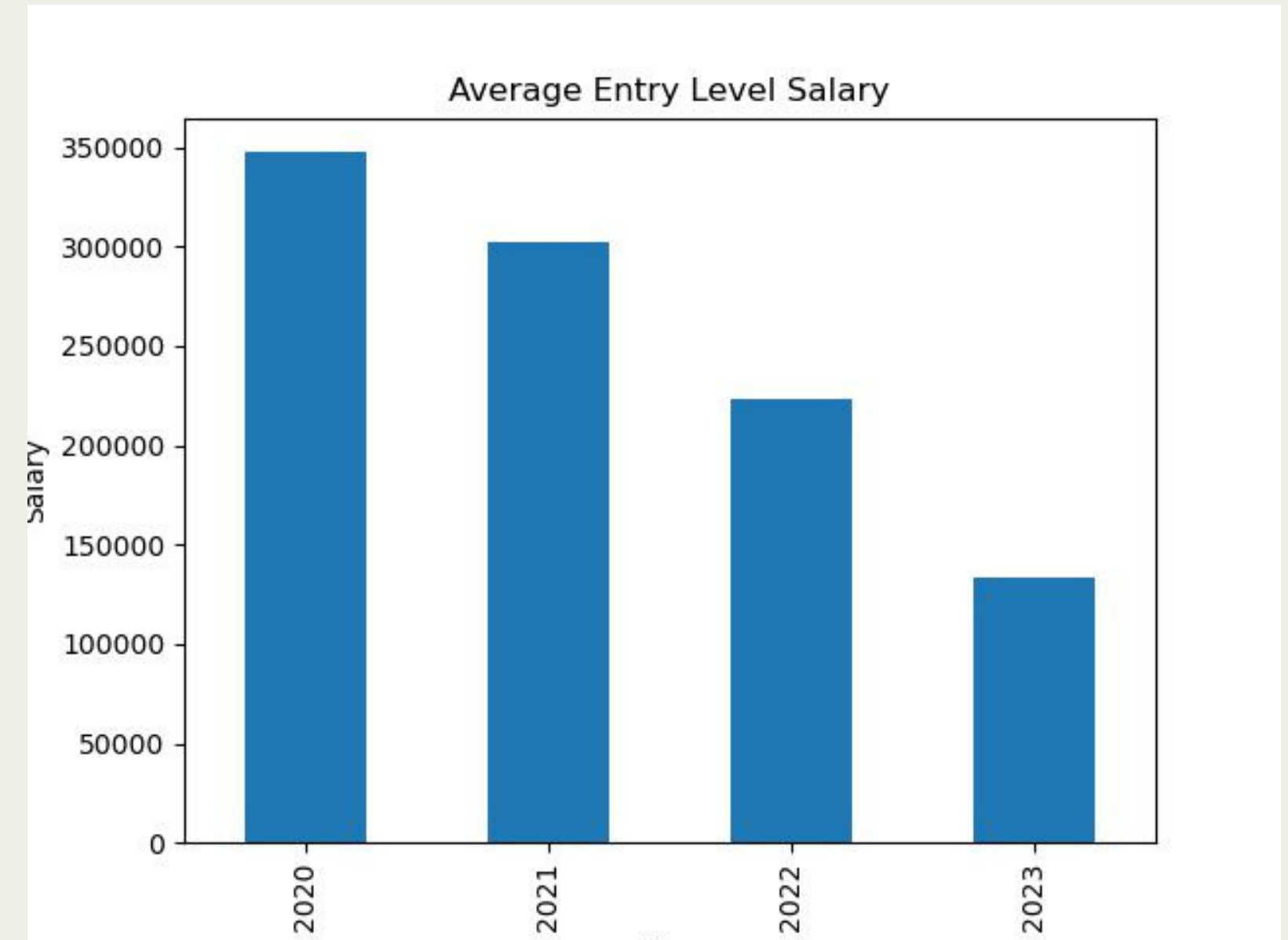
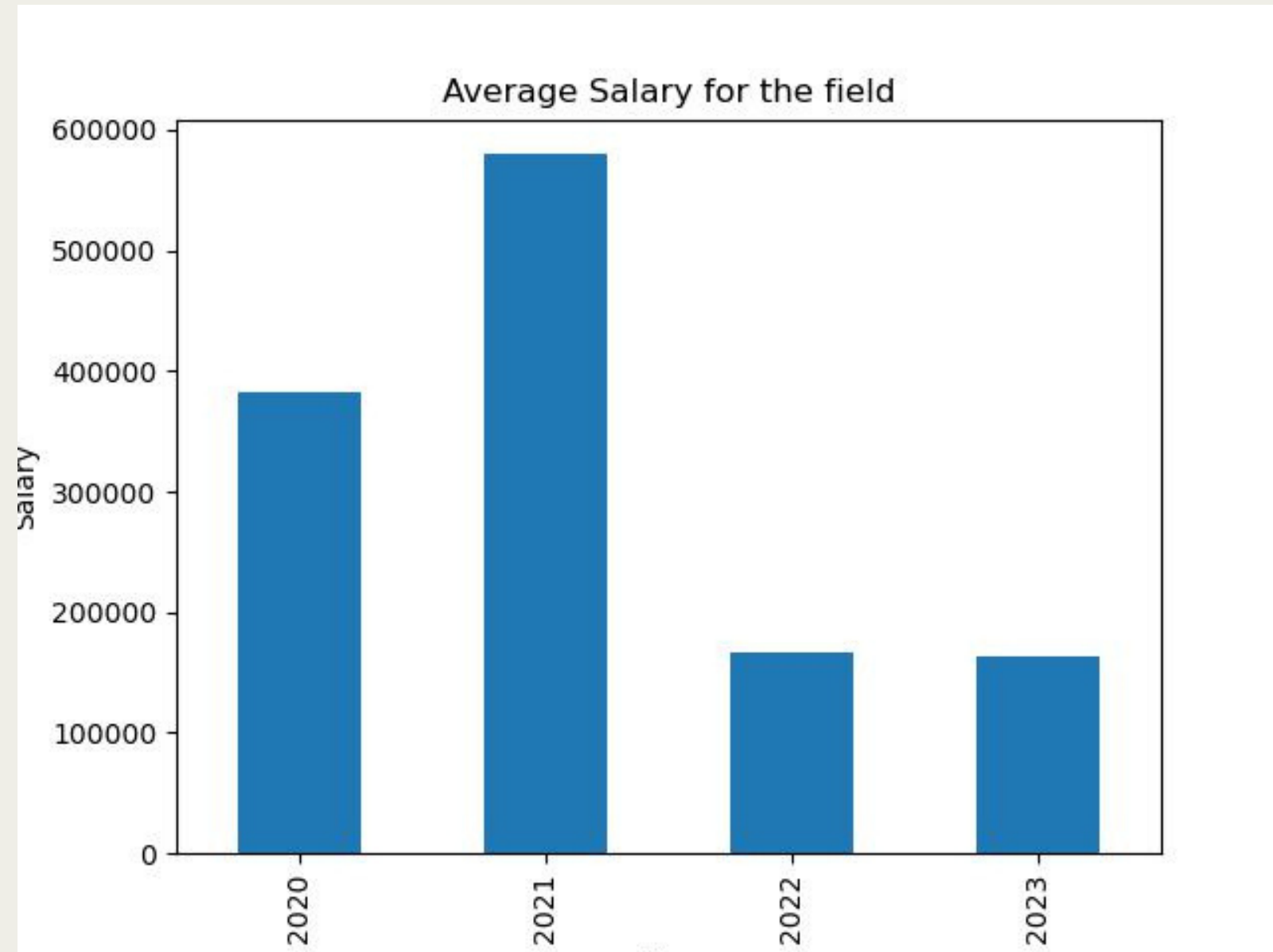
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## **ON AVERAGE, WHAT SALARY INCREASES CAN BE EXPECTED WITH GROWTH IN EXPERIENCE LEVEL?**

It varies, but all of the top 4 job titles show at least a \$20,000 increase in salary between experience levels.

# Question 3:

WHAT TRENDS CAN BE SEEN IN DATA PROFESSIONALS'  
SALARIES OVER THE PAST 3 YEARS?

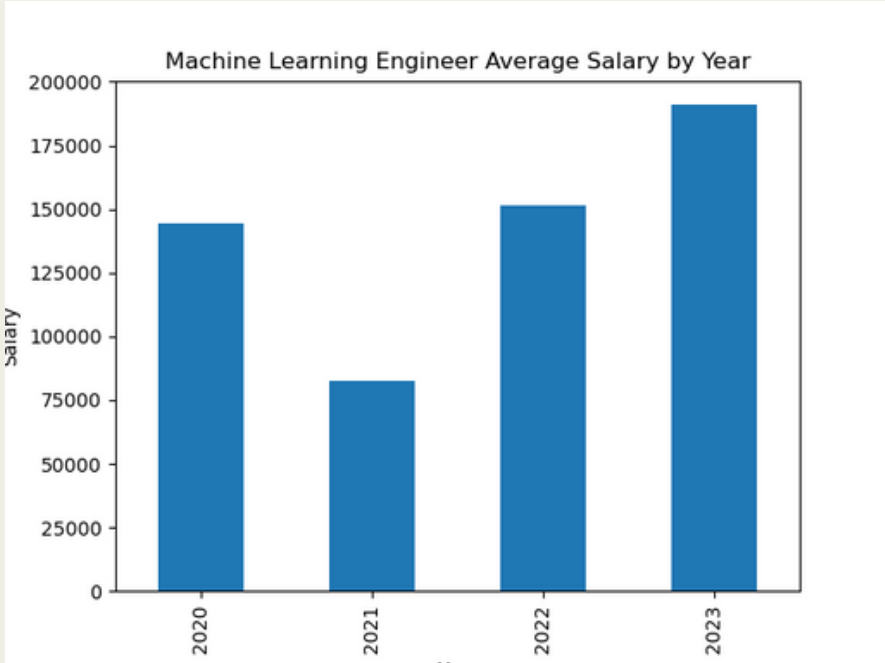
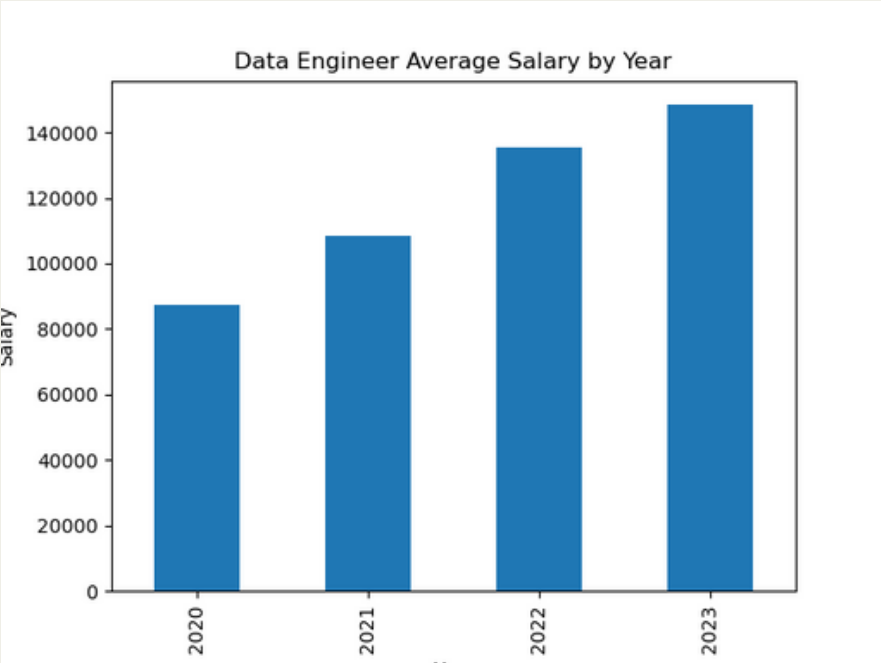
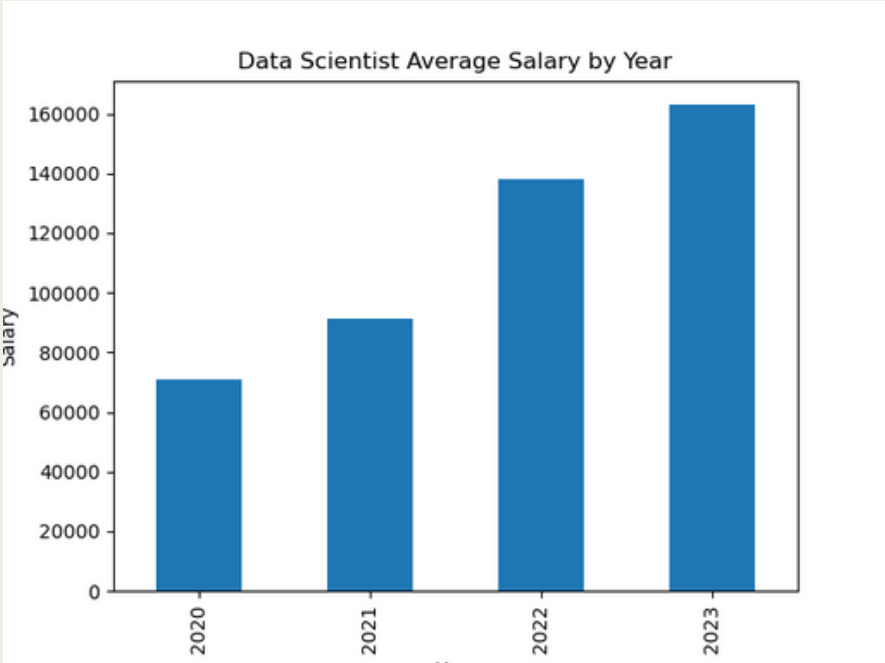
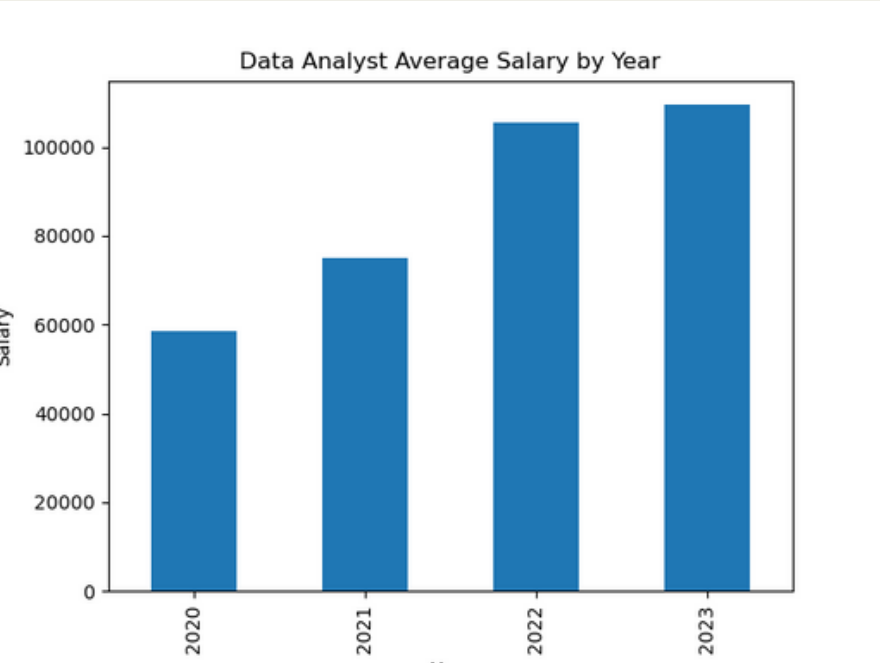


As you can see, the numbers here don't really make a whole lot of sense. 2021 data professionals salaries having that huge spike must mean at least one if not multiple significant outliers on the extreme high end, especially in 2020 and 2021, where there were less entries for these years. Same thing for the entry level position salaries, especially in 2020 and 2021. In the entry level graph, likely several job listings and salaries were mislabeled as entry level positions.

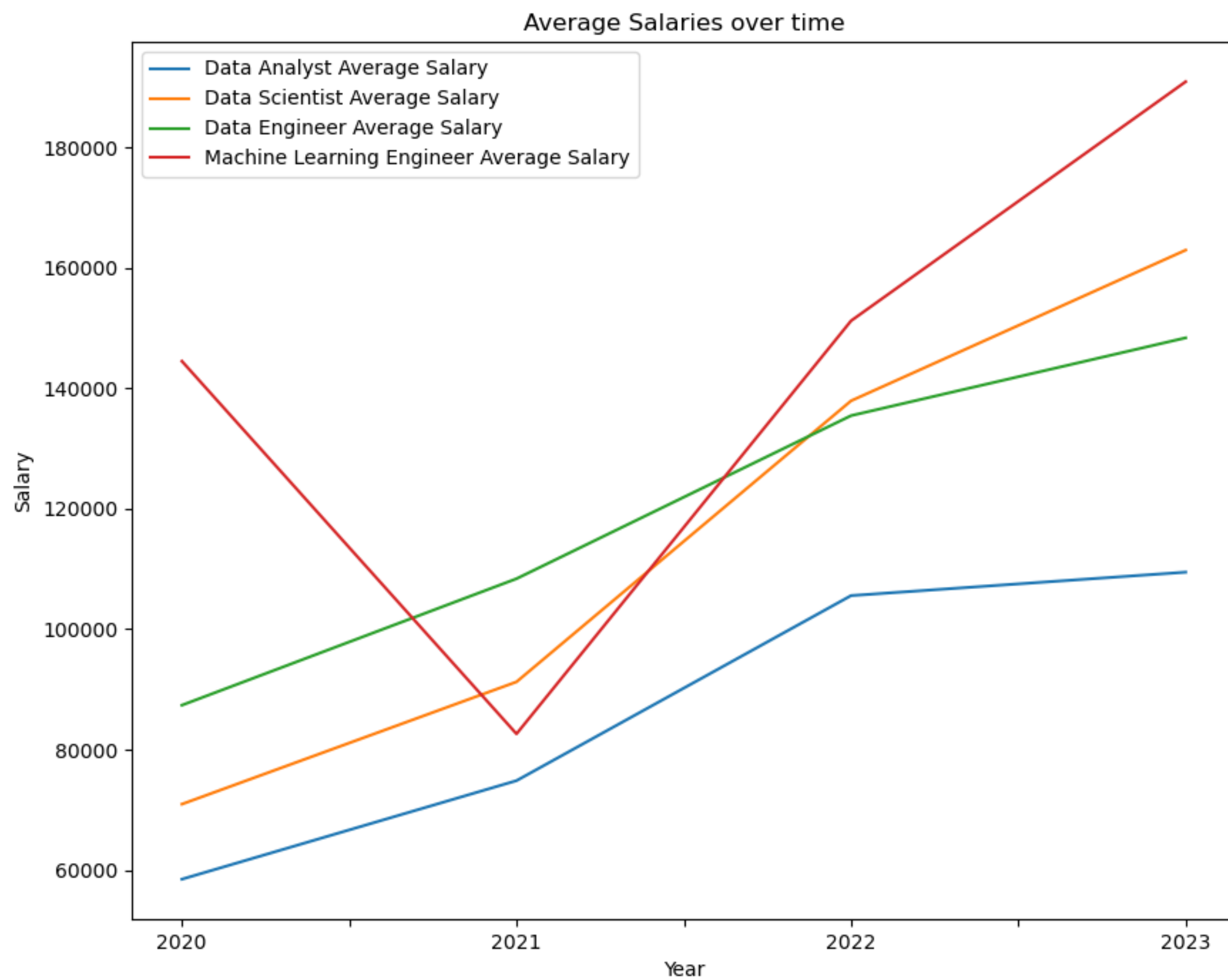


Filtered out the outliers, and grouped by the four most popular job titles, which are Data Analyst, Data Scientist, Data Engineer, and Machine Learning Engineer.

	Data Analyst Average Salary	Data Scientist Average Salary	Data Engineer Average Salary	Machine Learning Engineer Average Salary
2020	\$58,500.00	\$70,959.41	\$87,390.82	\$144,500.00
2021	\$74,858.67	\$91,260.00	\$108,388.64	\$82,627.75
2022	\$105,583.58	\$137,925.34	\$135,463.82	\$151,210.74
2023	\$109,472.25	\$162,942.43	\$148,378.81	\$190,905.57



With the outliers within each job title removed, we can see that the average salary for the four most popular job titles (Data Analyst, Data Scientist, Data Engineer, and Machine Learning Engineer) have seen significant growth every year. 2022 in the Machine Learning Engineer positions saw a decrease, but this is likely due to an incomplete data set. With the outliers included, these numbers told a very different story, where the average salary for Machine Learning Engineers in 2022 was listed at over a million dollars per year. But how do the job titles compare to each other?



# YEAR OVER YEAR INCREASES BY JOB TITLE

Salary growth				
	Data Analyst	Data Scientist	Data Engineer	Machine Learning Engineer
2020-2021	\$16,358.67	\$20,300.59	\$20,997.82	-\$61,872.25
2021-2022	\$30,724.91	\$46,665.34	\$27,075.18	\$68,582.96
2022-2023	\$3,888.67	\$25,017.09	\$12,914.99	\$39,694.83
Percent Growth				
	Data Analyst	Data Scientist	Data Engineer	Machine Learning Engineer
2020-2021	27.96%	28.61%	24.03%	-42.82%
2021-2022	41.04%	51.13%	24.98%	83.00%
2022-2023	3.68%	18.14%	9.53%	26.25%

**WHAT TRENDS CAN BE SEEN IN DATA  
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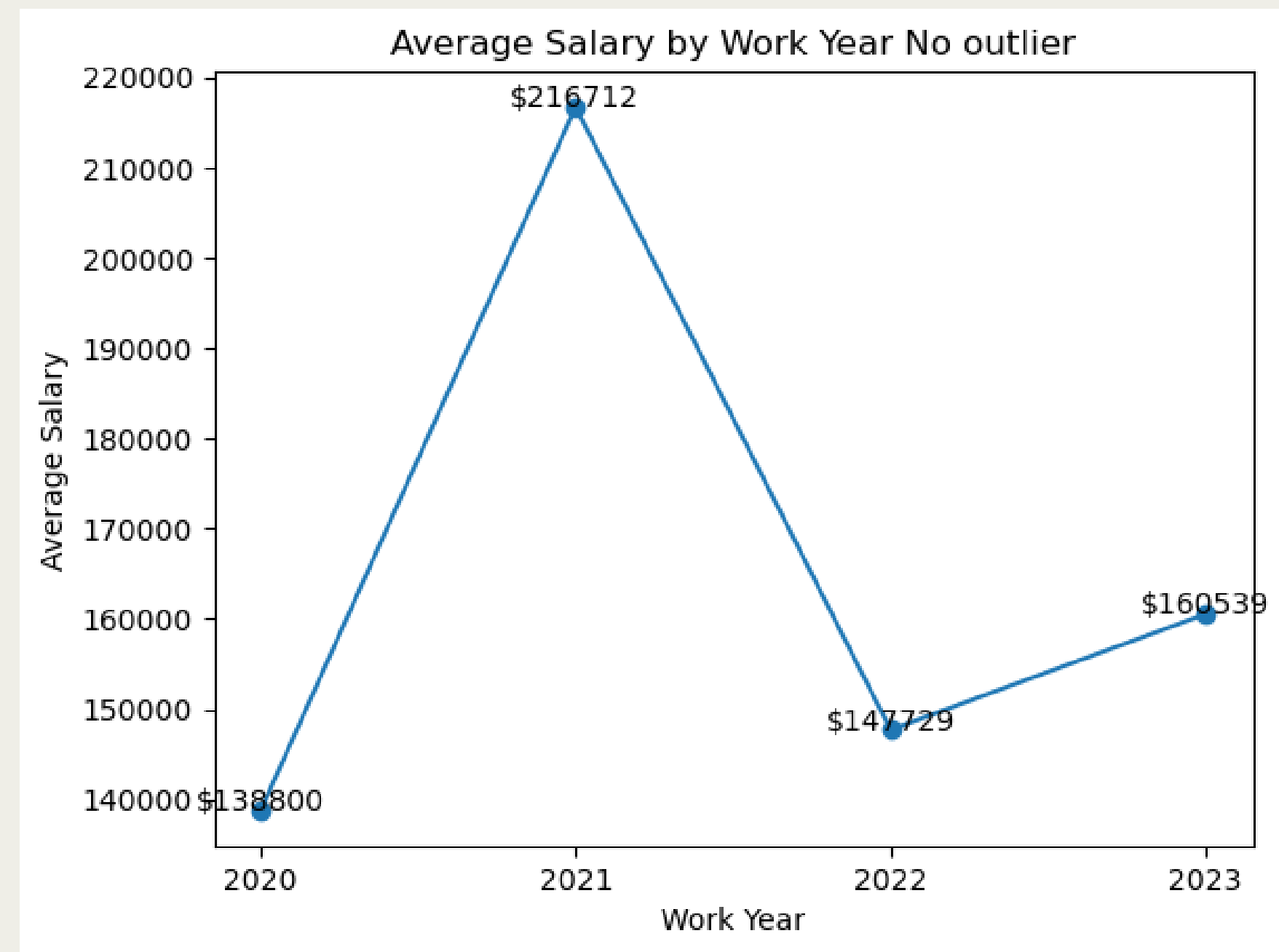
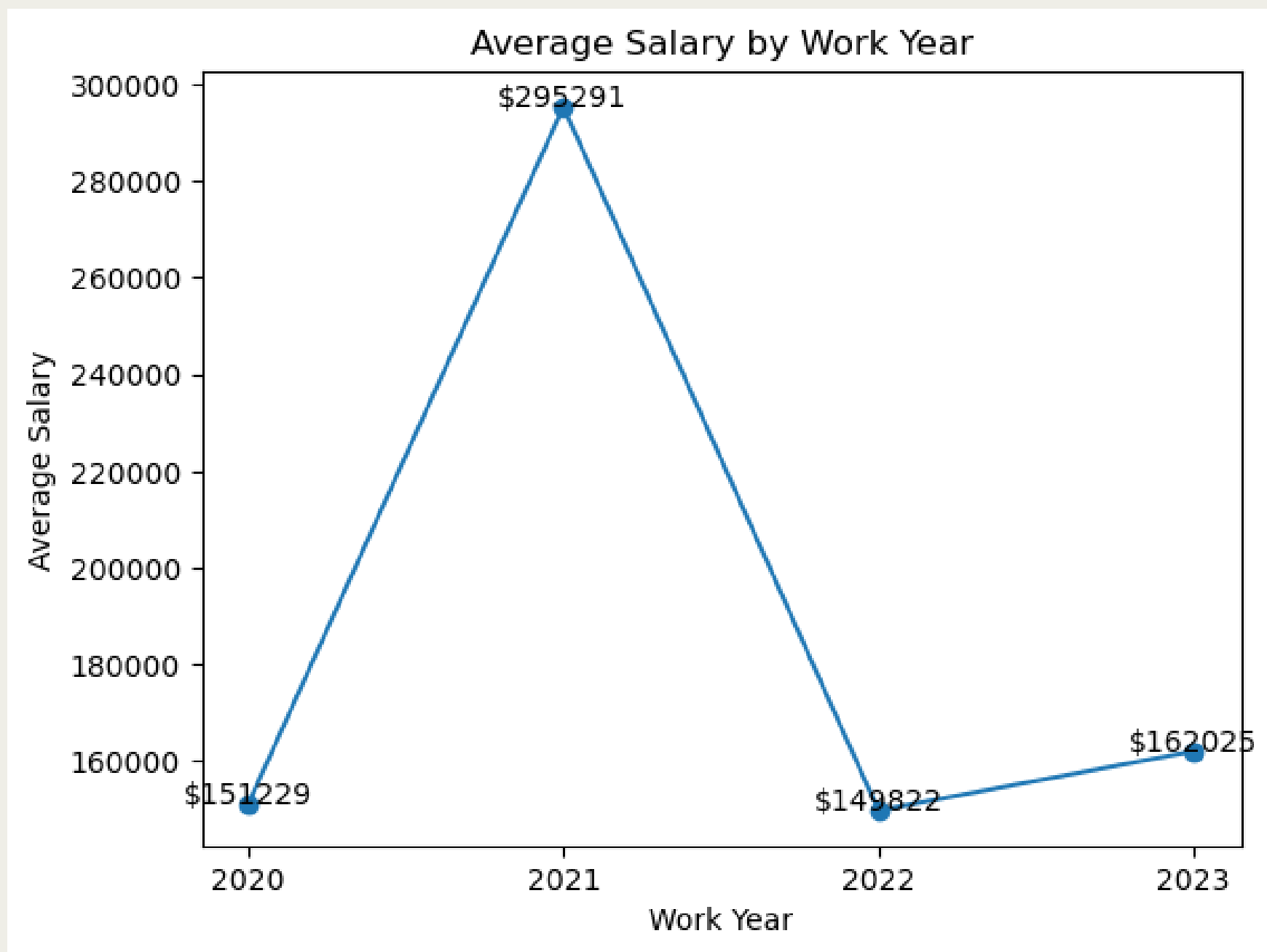
From these calculations, we can see that growth among these 4 job titles has been explosive over the last 3 years, although it has slowed in the last year. However, compared to the national average yearly raise of 7.6%, we can conclude that the field is growing, and growing faster than the national average.

Source: <https://www.zippia.com/advice/average-annual-raise/>

# Question 4:

WHAT IS THE AVERAGE SALARY FOR EACH JOB TITLE?



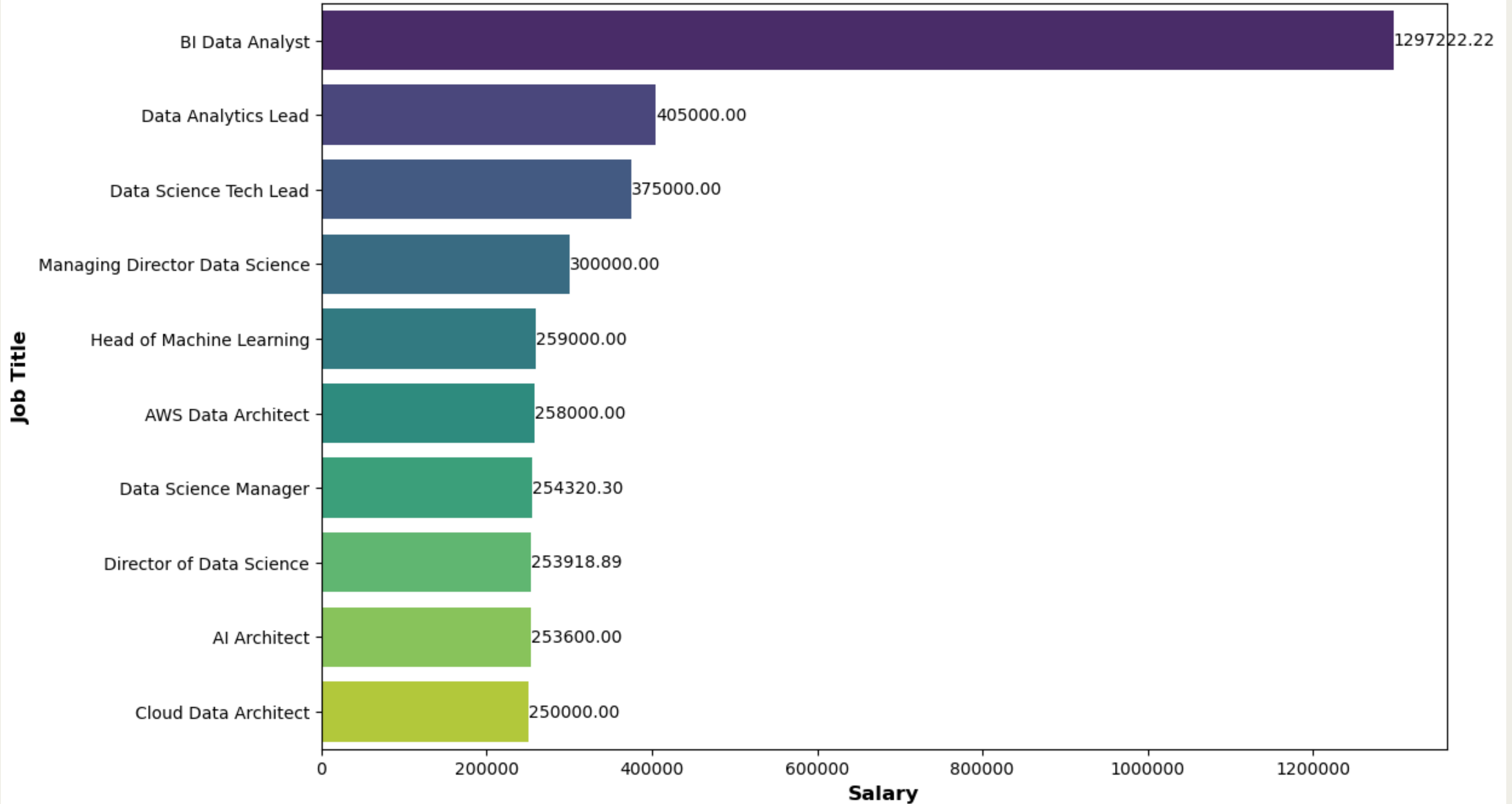


There were 96 unique job titles in our dataset.

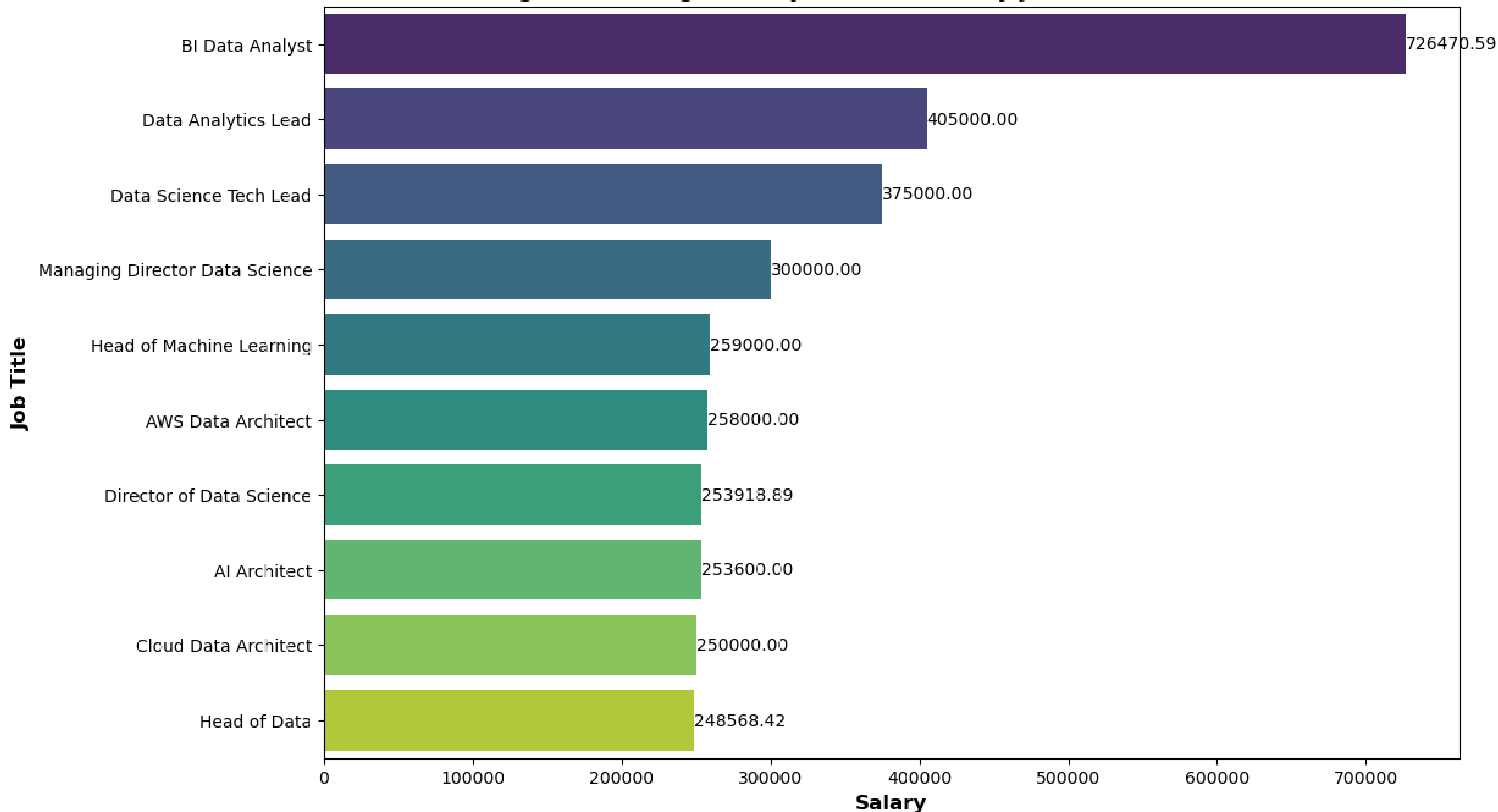
For highest and lowest average salary calculation by job title - We have used grouping by job title and average calculation on salary.

Data without outlier was also generated. Outlier calculation is performed on salary column, to remove values far enough outside the reasonable variation of values. So that salary average make sense for data analysis.

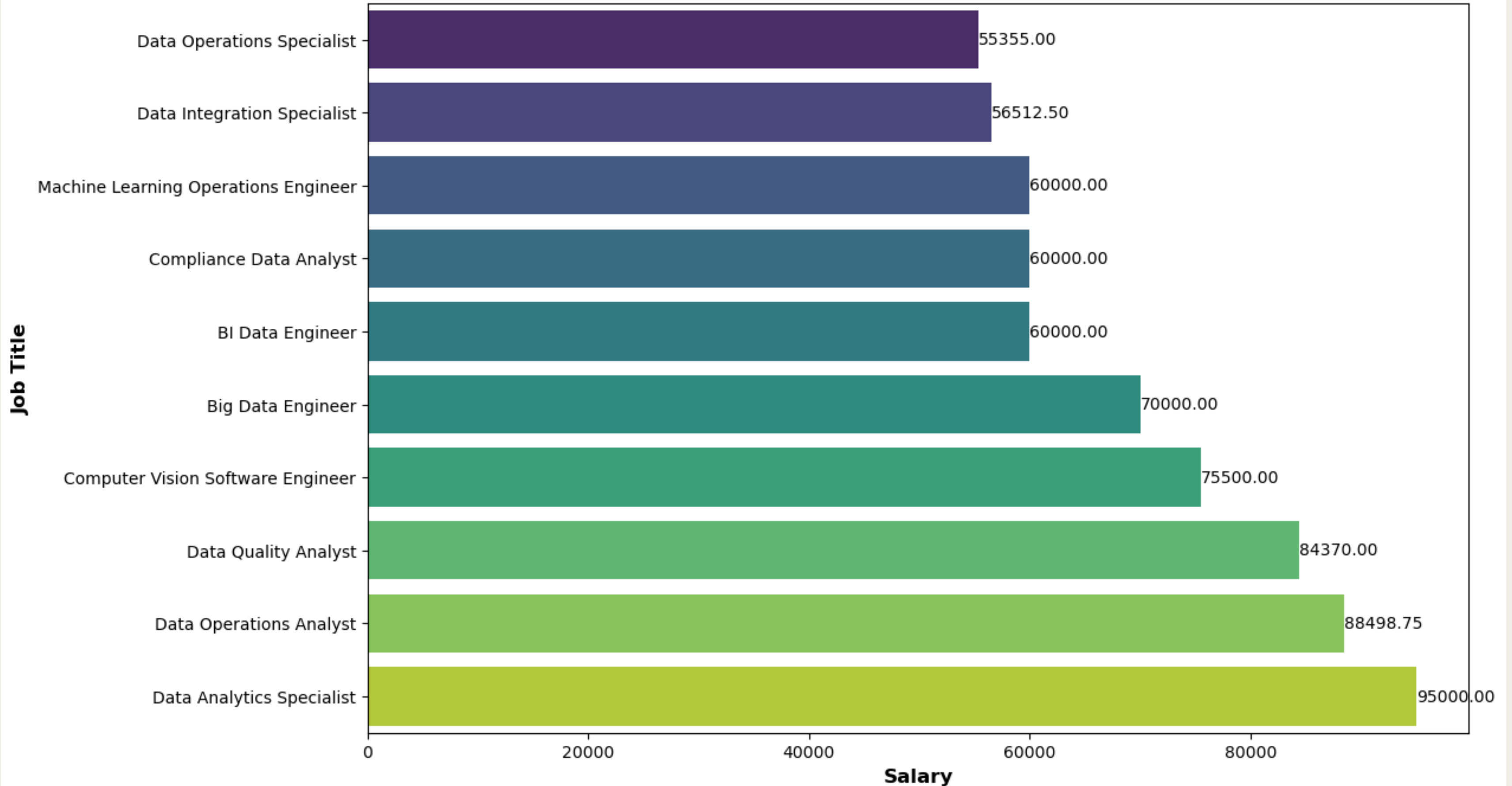
**Highest Average Salary Distribution by Job Title**



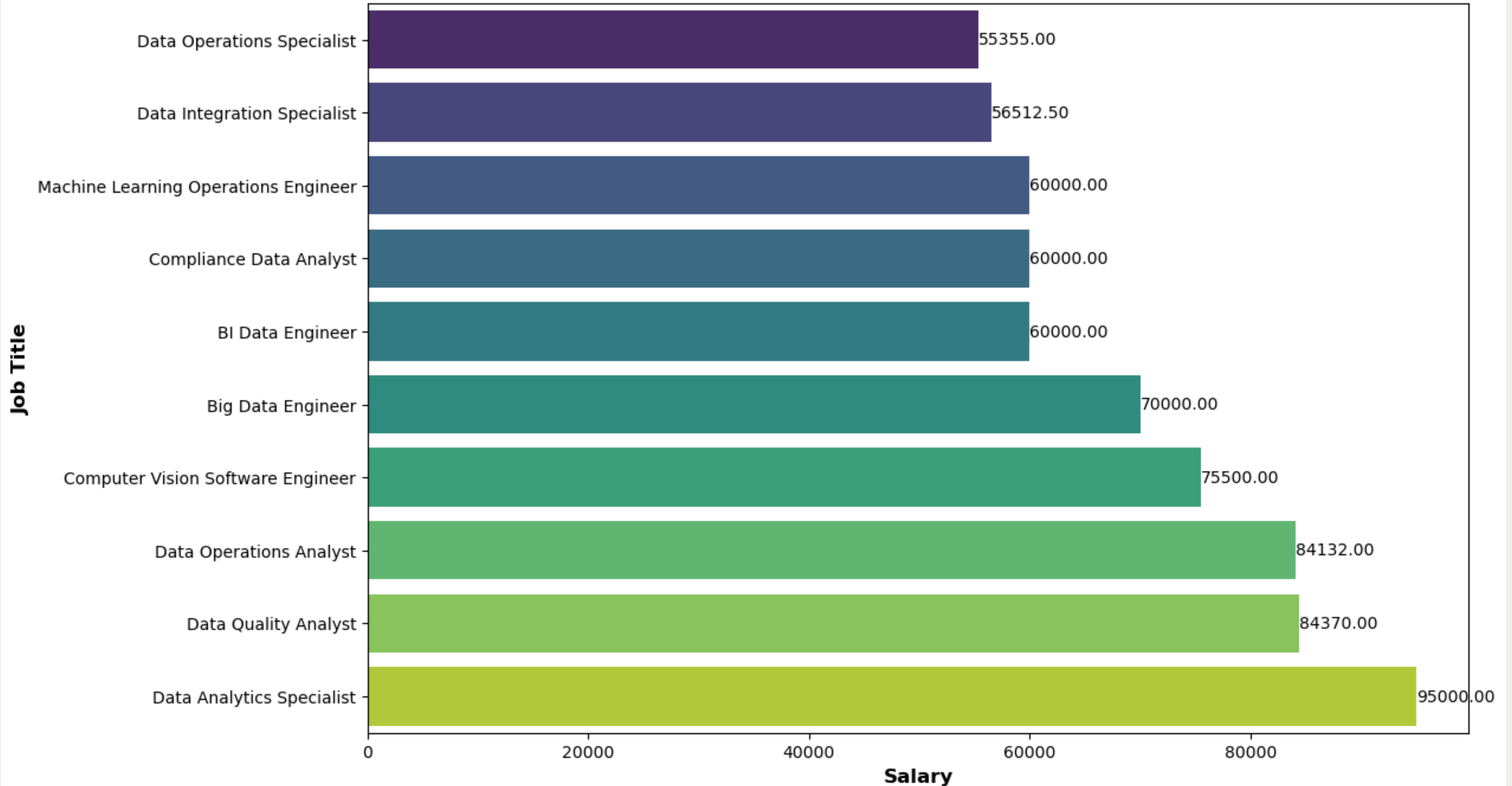
**Highest Average Salary Distribution by Job Title - No Outlier**



**Lowest Average Salary Distribution by Job Title**



**Lowest Average Salary Distribution by Job Title - No Outlier**



WHAT IS THE AVERAGE SALARY FOR EACH JOB  
TITLE?

## WHAT IS THE AVERAGE SALARY FOR EACH JOB TITLE?

After calculating average salaries on job titles, In top 10 highest average salaries we have noticed that after removing outliers the “Head of Data” job title drops out and it gives accurate list.

In case of Lowest average salaries by job titles, after removing outliers the average salary of “Data operational analyst” reduces by some amount.

Outliers are only greater than third quartile values in top average salary or low average salaries.



# Conclusion

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# Research Answers:

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**1:**

**COMPANY SIZE HAS VERY LITTLE EFFECT ON DATA PROFESSIONALS' SALARIES.**

**2:**

**DATA SCIENTISTS SHOW THE HIGHEST AVERAGE INCREASE BETWEEN EXPERIENCE LEVELS, BUT ALL OF THE TOP 4 JOB TITLES SHOW AT LEAST A \$20,000 INCREASE.**

**3:**

**DATA PROFESSIONALS' SALARIES ARE GROWING FASTER THAN THE NATIONAL AVERAGE.**

**4:**

**ON AVERAGE, BI DATA ANALYST, DATA ANALYTICS LEAD, AND DATA SCIENTIST TECH LEAD ARE THE JOB TITLES THAT SHOW THE HIGHEST SALARIES BETWEEN \$375,000-\$726,471.**

Questions?

