Analysis Report on Trends in Data Science Roles and Salaries

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A. Introduction:

This report analyses a job market dataset obtained from Kaggle, aiming to explore the relationship between key factors such as work year, experience level, employment type, job title, salary, and remote work ratio. This report provides insights into job market trends and income distributions, which may benefit both job searchers and organisations developing employment plans.

B. Descriptive Statistics:

The dataset consists of 14,838 rows and 11 columns.

Work Year: The mean year is 2023.14, with a standard deviation of 0.70, based on a dataset spanning the years 2020–2024.

Salary in USD The average pay is $149,874.72, with a large standard deviation of $69,009.18, indicating wide wage variation. The minimum wage is $15,000 and the maximum is $800,000.

Remote Ratio: The mean remote ratio is 32.76%, with a wide standard variation of 46.49%, showing a variety of work-from-home policies throughout the sample.

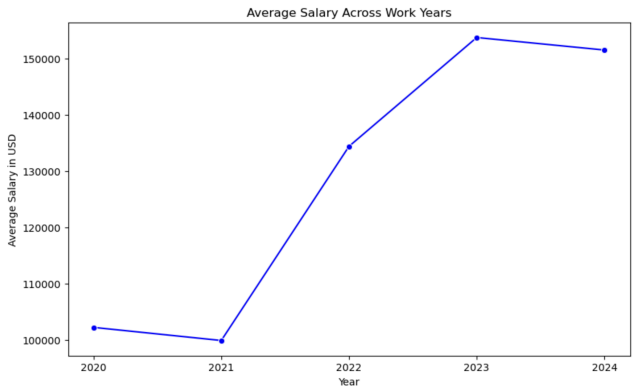
C. Data Cleaning:

To simplify the study, unimportant information such as salary','salary_currency', and 'employee_residence' were deleted.

Missing values and duplicates were removed for the accuracy of the data, leading to a clean dataset for analysis.

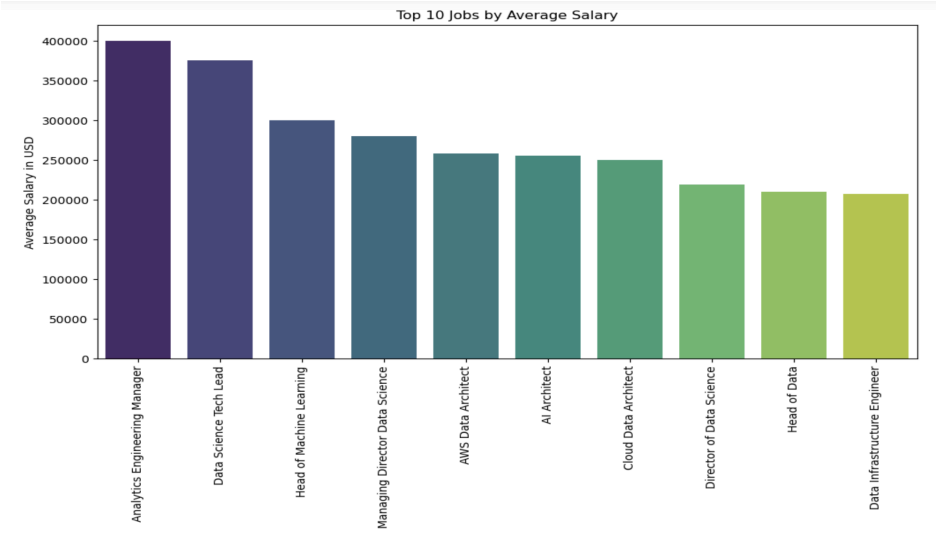
D.Data Visualization:

The **line plot** shows average salary trends from 2020 to 2024, highlighting significant changes driven by demand for data science and AI roles. Salaries in 2020 stayed steady at approximately $100,000, with a little decrease in 2021 due to economic situations. However, earnings increased sharply from 2021 to 2023, reaching almost $150,000, as demand for data scientists and experts in AI increased with the rapid development of AI technology. By 2024, wages had stabilised at this higher level, showing that companies are now maintaining highly competitive salary levels to keep talent in these career fields. This pattern shows how economic conditions, technology demand, and personnel needs affect salary structures throughout time.

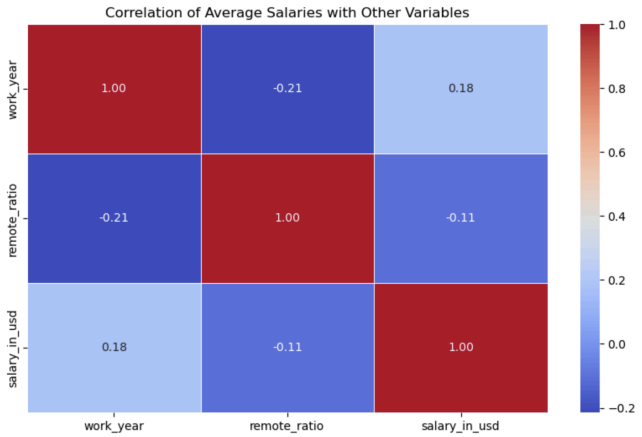


The **Bar chart** shows the top ten highest-paying jobs in data science, ranked by average salary , highlighting roles that connect technical skill with strategic control. The Analytics Engineering Manager position has an average pay of around 400,000 It suggests a growing need for managers who

can mix analytics and engineering to make decisions based on data. Managerial jobs such as Data Science Tech Lead and Managing Director of Data Science give valuable pay, showing the importance of leadership in this profession. Specialised technical jobs, such as AWS Data Architect and AI Architect,show the increasing need for cloud and AI knowledge. While Data Infrastructure Engineer rates lower, it still pays effectively, focusing on the importance of basic data structures.These trends indicate that careers that combine advanced technical abilities with management are in high demand, especially as AI and data analytics develop more importance across industries.



The **correlation matrix** shows the correlations between average salaries, work years, and remote work percentages. Key findings include a small positive correlation (0.18) between work_year and salary_in_usd, suggesting that incomes have increased somewhat over time. The remote_ratio shows a slight negative correlation (-0.11) with salaries, suggesting that remote work has less payment levels. Similarly, the work_year and remote_ratio correlation (-0.21) indicates that as work years grow, remote work ratios fall lightly, probably suggesting that longer-tenured staff work less remotely.



Conclusion:

The average salary increased significantly between 2020 and 2024, mainly due to high demand for qualified data scientists and artificial intelligence workers. The greatest increase happened between 2021 and 2023, most likely owing to important developments in AI technology. By 2024, salary levels were steady. High-paying jobs such as Analytics Engineering Manager and AI Architect demonstrate the rising importance of combining technical knowledge and leadership. The low correlations between salary, work year, and remote ratio indicate that remote work options have little impact on salary. This study shows how market trends and advances in technology impact pay trends.