COMP5070_SP2_2023
Exam
Data Science Job Market in Australia

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Introduction

Given the rapid growth of the Data Science field and its increasing demand across various industries, understanding the dynamics of the job market becomes crucial for both job seekers and employers to stay competitive and make informed choices.

This report presents a comprehensive analysis of the Data Science job market in Australia, leveraging data sourced from Seek.com.au, the leading job search website in the country. The aim of this analysis is to provide valuable insights to job seekers and employers, enabling them to make informed decisions regarding job opportunities and recruitment strategies.

Exploratory Data Analysis

The exploratory data analysis section delves into the dataset obtained from Seek.com.au, focusing on key statistical findings related to annual salaries in the Data Science domain. By examining summary statistics such as median salary, standard deviation, maximum salary, and the number of missing values, this section offers a comprehensive overview of the salary landscape. Additionally, visualizations in the form of histograms provide a clear understanding of the salary distribution, aiding job seekers and employers in grasping the prevailing salary levels within the market.

Table 1: Summary Statistics for Annual Salary in Seek Data Scientist Dataset

salary_median	salary_sd	salary_max	n_missing
85607.00	58763.35	180000.00	363

Table 1 displays the summary statistics for the annual salary in the Seek Data Scientist dataset. The median salary is $85,607, with a standard deviation of $58,763. The maximum salary recorded is $180,000, and there are 363 missing values in the salary column.

Table 2: Number of unique values for each feature

	Unique_Counts
job_title	354
area	23
industry	18
state	8

Table 2 presents the number of unique values for each feature in the dataset. There are 354 unique job titles, 23 unique areas, 18 unique industries, and 8 unique states represented in the dataset.

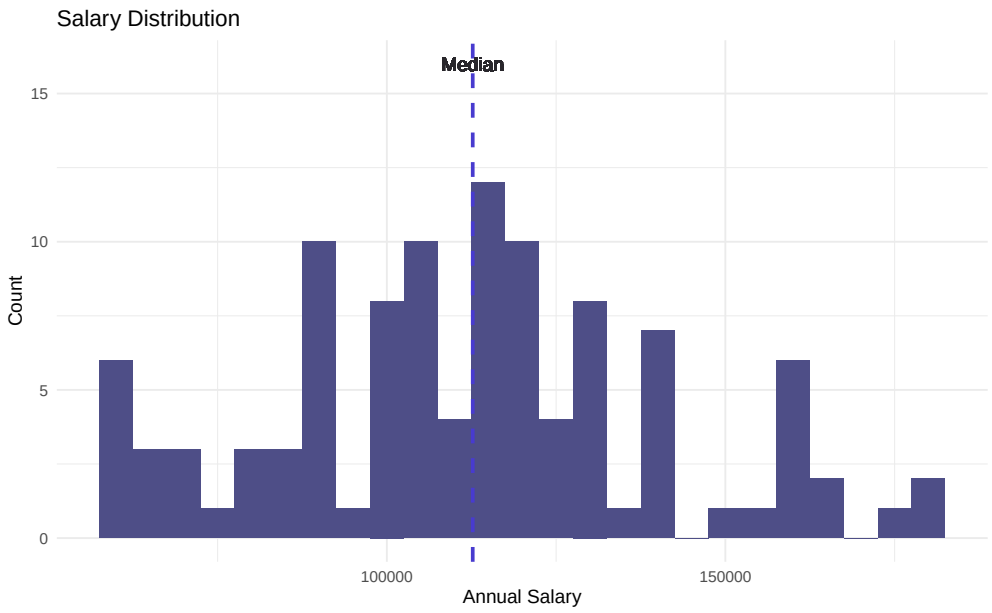

Figure 1. Salary Distribution in Seek Data Scientist Dataset.

Figure 1 illustrates the distribution of salaries in the Seek Data Scientist dataset. The histogram provides an overview of the salary ranges for data science positions. Further analysis of the distribution can help job seekers and employers understand the prevailing salary levels in the market.

Job Market Distribution across States

This section investigates the distribution of Data Science job positions across different states in Australia. Through the utilization of bar charts, it presents a visual representation of the number of available positions in each state. Furthermore, employing boxplots, this section examines the salary distribution per state, aiming to identify states that offer higher salaries for Data Scientist roles. By combining visual and tabular data, this analysis helps job seekers and employers comprehend the regional dynamics of the job market and make informed decisions accordingly.

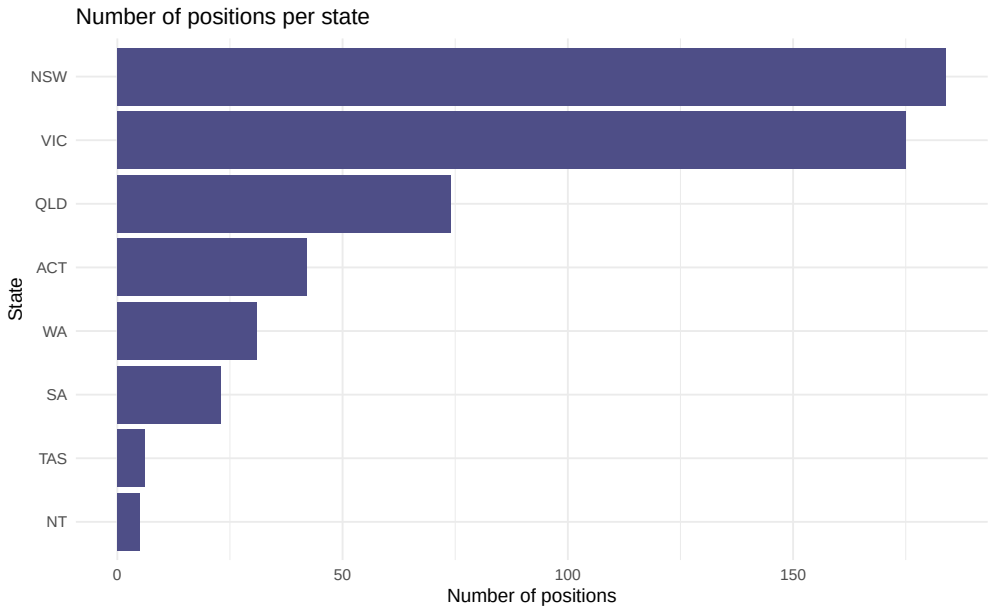

Figure2: Number of positions per state.

Now that we have visualized the number of positions available in each state, let's compare the salary distributions across states. This will provide insights on whether certain states tend to offer higher salaries for Data Scientist roles.

Let's use a boxplot to visualize the salary distribution per state: Boxplot for salary_annual by state or industry: This can give you a sense of the salary distribution per state or industry.

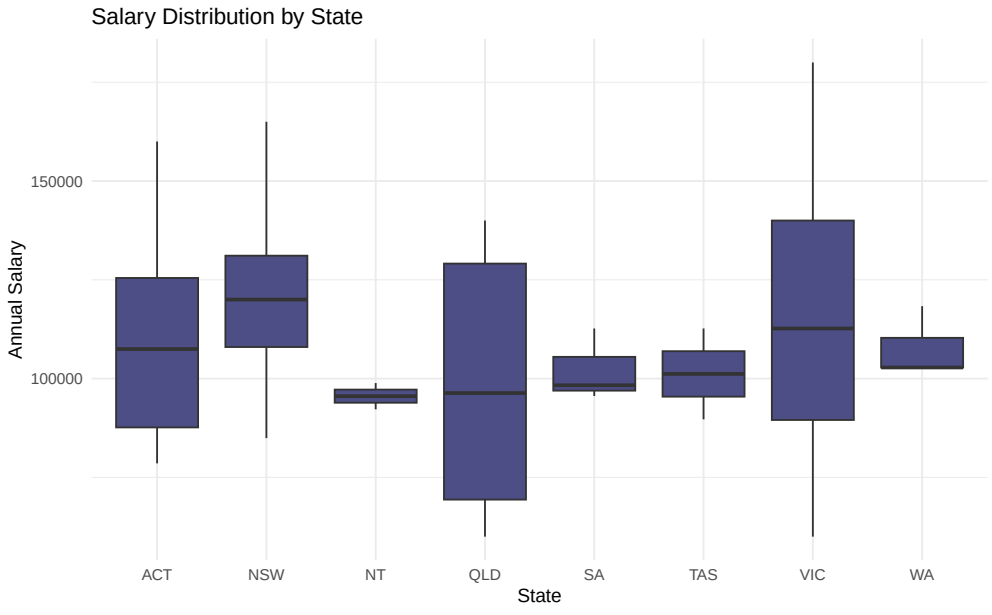

Figure 3: Salary distribution by state.

Table 3: the number of positions per state and median salary per state

state	n	median_salary
ACT	42	107475
NSW	184	120000
NT	5	95548
QLD	74	96341
SA	23	98313
TAS	6	101181
VIC	175	112682
WA	31	102808

The analysis reveals that New South Wales (NSW) and Victoria (VIC) dominate the Data Science job market, with 184 and 175 positions respectively. Despite being considerably smaller, the Australian Capital Territory (ACT) also offers a substantial number of positions, housing 42 opportunities. Conversely, Tasmania (TAS) and the Northern Territory (NT) proffer the fewest opportunities, with 6 and 5 positions respectively.

The analysis of salary distributions reveals that NSW offers the highest median salary at AUD 120,000, followed by VIC with AUD 112,682 and ACT with AUD 107,475. The lowest median salary is recorded in NT, amounting to AUD 95,548. Thus, NSW and VIC emerge as the most attractive destinations for data scientists, with a plethora of job opportunities and competitive median salaries. On the other hand, TAS and NT, while providing fewer opportunities, still offer relatively competitive salaries.

Job Titles and Industries

The job titles and industries section explores the most common job titles and industries within the Data Science job market. Through the use of bar charts, it provides a visual depiction of the frequency of the top 10 job titles and industries. Furthermore, detailed tables present the specific job titles and industries along with their respective frequencies. The analysis also includes an examination of median salaries by industry, allowing job seekers and employers to identify sectors that offer higher compensation. This section assists in aligning career aspirations and recruitment strategies with the prevailing job titles and industries in the market.

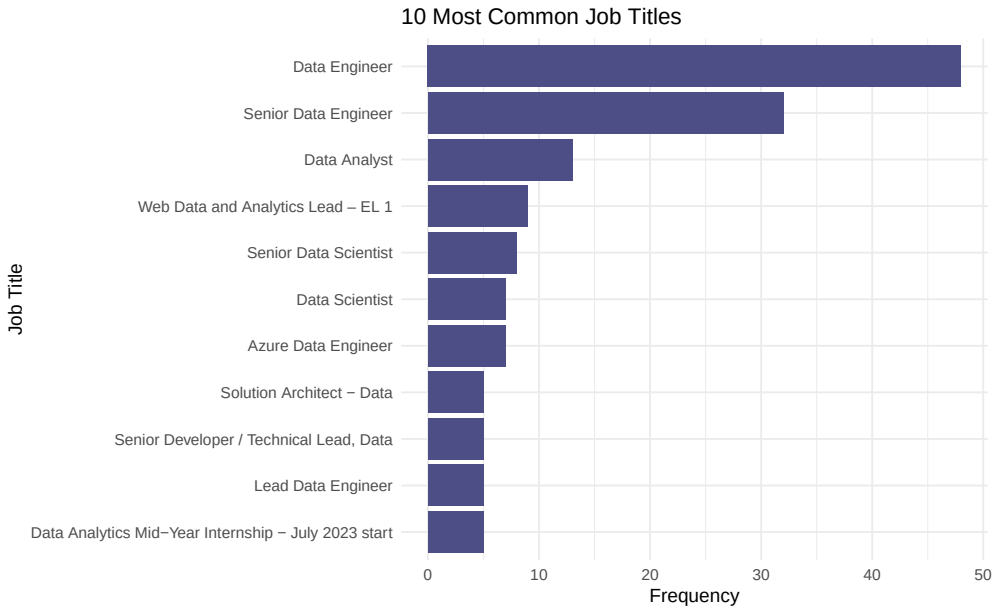

Figure 4: 10 Most Common Job Titles

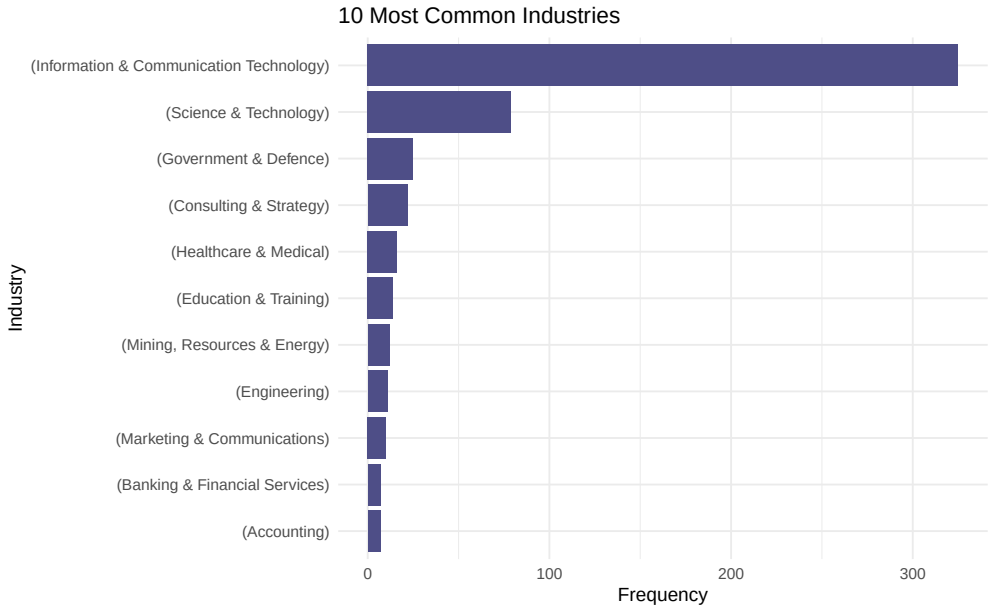

Figure 5: 10 Most Common Industries.

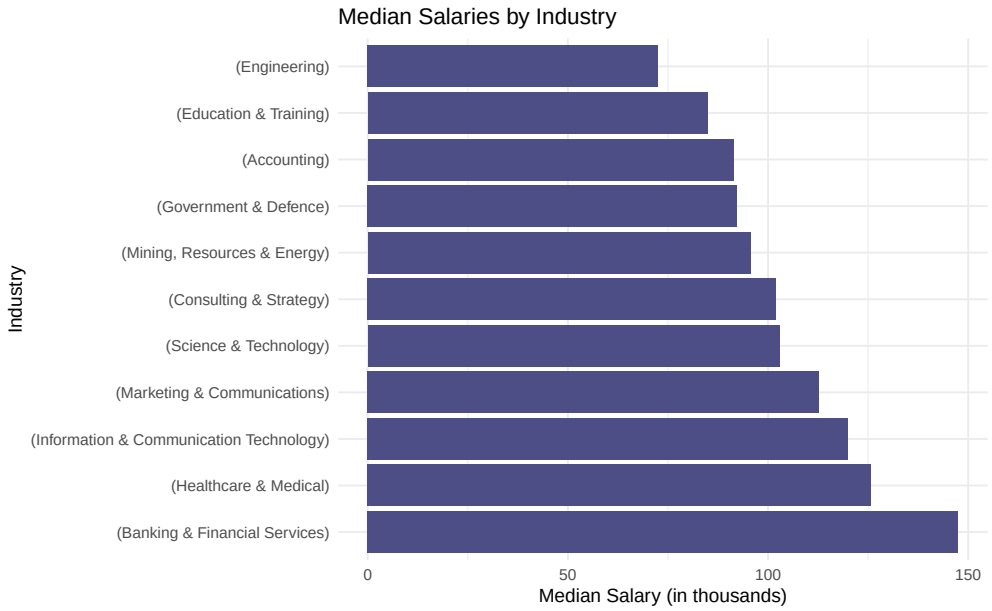

Figure 6: Median Salaries by Industry.

Table 4: 10 Most Common Job Titles

job_title	n
Data Engineer	48
Senior Data Engineer	32
Data Analyst	13
Web Data and Analytics Lead – EL 1	9
Senior Data Scientist	8
Azure Data Engineer	7
Data Scientist	7
Data Analytics Mid-Year Internship - July 2023 start	5
Lead Data Engineer	5
Senior Developer / Technical Lead, Data	5
Solution Architect - Data	5

Table 5: 10 Most Common Industries

industry	n
(Information & Communication Technology)	325
(Science & Technology)	79
(Government & Defence)	25
(Consulting & Strategy)	22
(Healthcare & Medical)	16
(Education & Training)	14
(Mining, Resources & Energy)	12
(Engineering)	11
(Marketing & Communications)	10
(Accounting)	7
(Banking & Financial Services)	7

Table 6: Median Salaries by Industry (in thousands)

industry	median_salary
(Accounting)	91.42
(Banking & Financial Services)	147.50
(Consulting & Strategy)	101.95
(Education & Training)	84.94
(Engineering)	72.50
(Government & Defence)	92.23
(Healthcare & Medical)	125.72
(Information & Communication Technology)	120.00
(Marketing & Communications)	112.68
(Mining, Resources & Energy)	95.59
(Science & Technology)	102.81

When it comes to job titles, "Data Engineer" is the most frequent, followed by "Senior Data Engineer" and "Data Analyst". The "Information & Communication Technology" industry emerged as the most prevalent industry for data science roles, significantly outnumbering other sectors like "Science & Technology" and "Government & Defence".

Regarding salary distribution across industries, the "Banking & Financial Services" sector pays the highest median salary (AUD 140,000), followed by "Healthcare & Medical" and "Marketing & Communications" industries. It's worth noting that these salary metrics are based on job postings and may not necessarily represent the final compensation provided, which could also include benefits and bonuses.

Time-Based Analysis of Job Postings

This section focuses on the temporal patterns of job postings in the Data Science field. A line chart illustrates the number of job postings over time, offering insights into the fluctuations in job demand. Additionally, a bar chart and a table provide an analysis of job postings based on the day of the week, enabling job seekers and employers to identify patterns and optimize their job search and recruitment efforts accordingly. This time-based analysis aids in understanding the dynamics of job availability and assists in planning effective job search and recruitment strategies.

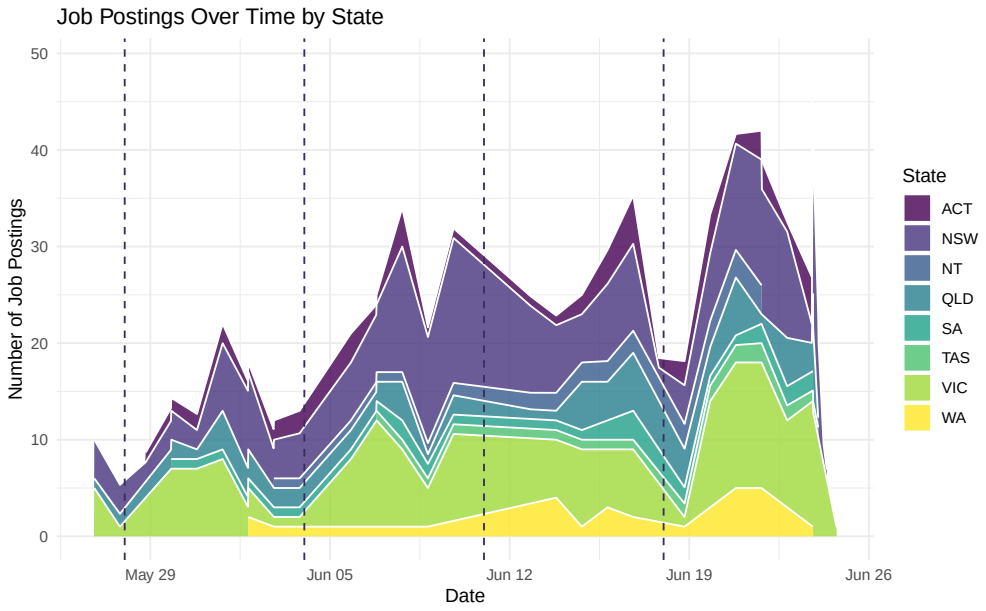

Figure 7: Job Postings Over Time, Stacked by State, with Week Start Indicated by Dashed Lines.

A time series analysis of the job postings reveals significant fluctuations, indicating that the demand for data scientists varies over time. However, a more granular analysis that factors in events such as economic fluctuations or policy changes may be required to provide precise explanations for these variations.

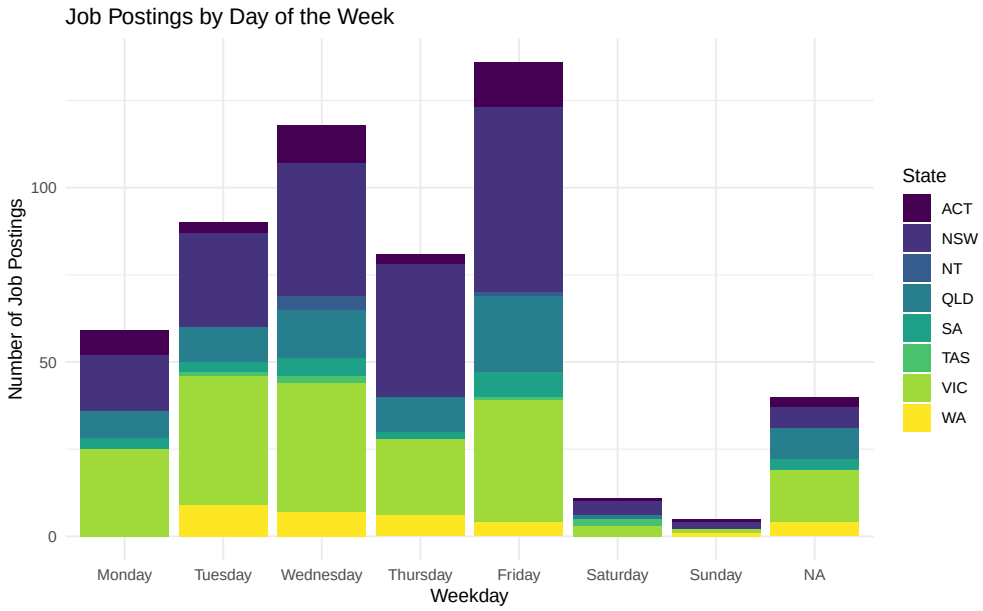

Figure 8: Job Postings by Day of the Week.

Table 7: Job Postings by Day of the Week

weekday	n
Friday	136
Monday	59
Saturday	11
Sunday	5
Thursday	81
Tuesday	90
Wednesday	118
NA	40

Moreover, an analysis of the distribution of job postings across weekdays shows a surge in postings at the start and end of the working week, with the highest number recorded on Fridays. The number of postings drops significantly over the weekend, demonstrating the typical job posting behaviour in line with the conventional work week.

Conclusions and Recommendations

The Australian Data Science job market exhibits considerable variations across different regions, job titles, and industries. Therefore, a comprehensive understanding of these variations is imperative for job seekers to identify opportunities that align with their career aspirations and for employers to remain competitive in the job market. While NSW and VIC may be the most desirable destinations for a majority, TAS and NT also present viable opportunities with relatively lesser competition.

It is recommended that job seekers stay vigilant to the fluctuations in job postings over time and across weekdays, to optimize their job search efforts. Similarly, employers could leverage this understanding to

time their postings for maximum visibility. Furthermore, continuous monitoring and analysis of the job market would be beneficial, considering the fast-paced evolution of the Data Science field.

A future study could explore the relationship between job titles, associated skills, and salaries to provide a more granular understanding of the job market, potentially aiding job seekers in identifying high-demand skills and employers in developing competitive compensation packages.

In conclusion, this report highlights the key findings and provides actionable insights for job seekers and employers in the Data Science job market in Australia. Understanding regional variations, leveraging temporal patterns, and identifying prevalent job titles and industries are essential for making informed decisions. It is recommended that job seekers and employers remain vigilant, continuously monitor the job market, and adapt their strategies accordingly. Future research endeavors could explore the relationship between job titles, associated skills, and salaries to provide a more detailed understanding of the job market dynamics and further support job seekers and employers in their decision-making processes.