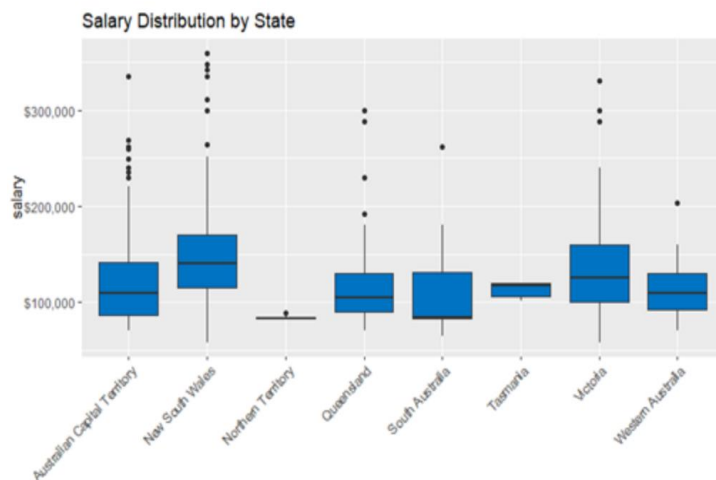
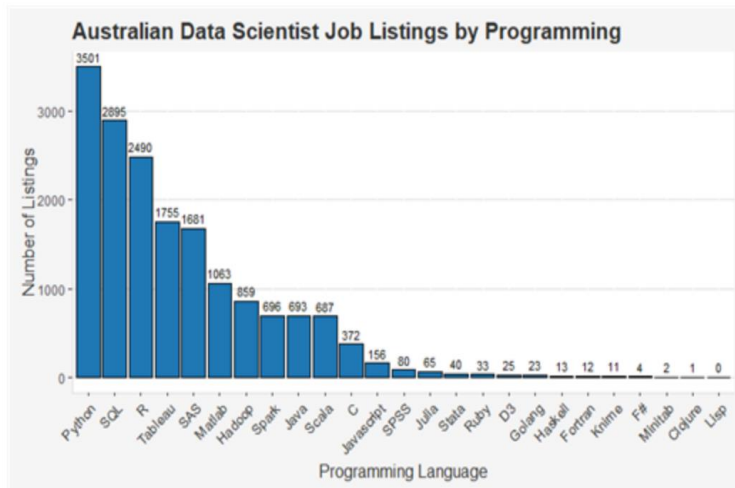


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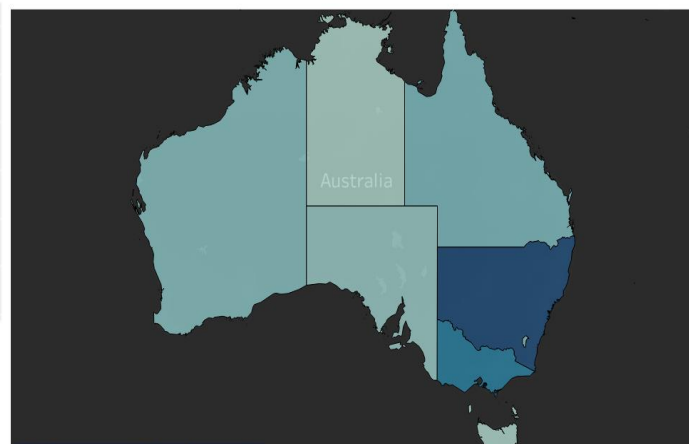
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## Dashboard

### Dashboard (Exploring Data Science Opportunities in Australia)



Number of data science job listings per state



## Introduction

In recent years, the exponential growth of data across various industries has led to a significant surge in demand for data science-related roles. This increase highlights the urgent need for professionals capable of navigating and interpreting large datasets to support informed decision-making. Data science jobs play a pivotal role in this landscape, utilizing their expertise to extract valuable insights from data (Ramasubbareddy, 2019). This project aims to provide a comprehensive analysis of data science job listings across Australia, using various visualizations to uncover key trends and insights. The intended audience could be Data science students and current professionals looking to transition into data science roles.

The project aims to explore job opportunities in Data Science by addressing the primary questions such as which geographic regions have the highest demand for data science professionals, which programming languages are most sought after, how job listings have trended over time and what the typical salary distributions are across different states. Additionally, the project explores the timing of job postings throughout the week, providing strategic insights for job seekers on optimal application times. By examining these aspects and understanding the dynamics of data science jobs is essential for both aspiring data science students and current professionals to make informed decisions regarding their career paths, skill development strategies and align their skills with market demands.

## Data Sources

The data source for exploring Data Science job opportunities comes from Kaggle. The data was collected, prepared and cleaned by Nomilk from job listings sourced from seek.com.au, a prominent Australian job search website. It provides over 50 columns of rich numeric, geographic and text data to explore. This dataset contains information related to job listings, including various qualitative and quantitative variables.

**Qualitative Variables:** These variables describe qualities or characteristics and include job title, classification, advertiser name, company name, teaser, nation, state, city, area, suburb, work type, whether right to work is required, desktop and mobile ad templates, company profile URL, seek job listing URL, first seen, last seen, and recruiter.

**Quantitative Variables:** The dataset also includes quantitative variables such as listing date, expiry date, salary string and skills.

## Visualization Results

### Number of data science job listings per state

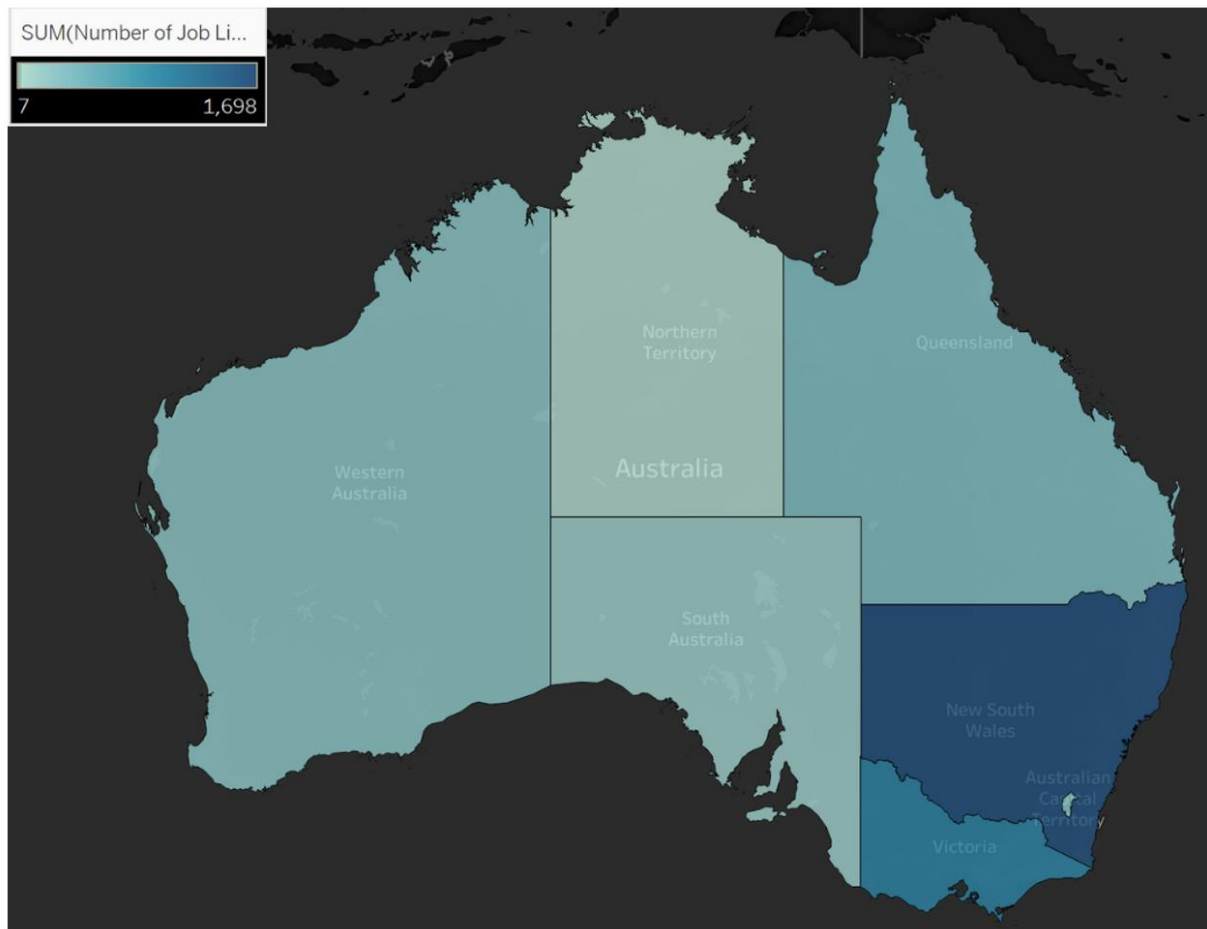


Figure 1: Number of data science job listings per state

The map visualization in Figure 1 illustrates the geographic distribution of data science job listings across different states in Australia. The color gradient indicates the number of job listings, with darker shades representing higher concentrations. New South Wales (NSW) stands out with the highest number of job listings, followed by other states like Victoria and Queensland. This geographic representation highlights NSW as a key hub for data science opportunities, suggesting a significant demand for data science professionals in this region.

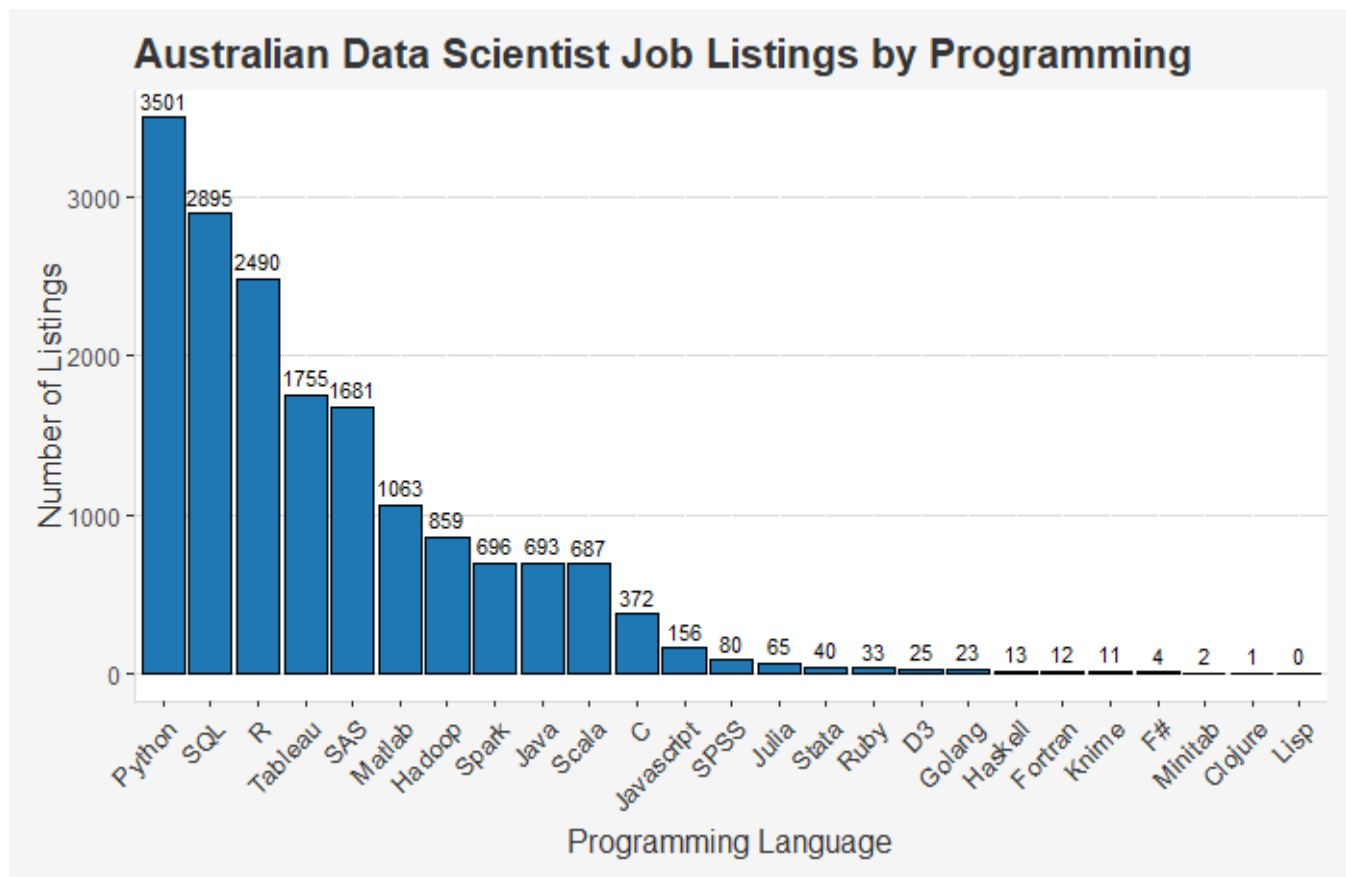


Figure 2: Australian Data Scientist Job Listings by Programming

Building on the geographical insights, the next step is to examine the specific skills in demand. The bar chart in Figure 2 illustrates the demand for various programming languages in Australian data scientist job listings. Python leads with the highest number of job listings at 3,501, followed by SQL and R with 2,895 and 2,490 listings, respectively. Python, SQL, and R emerge as the top three programming languages in high demand, underscoring their critical role in data science projects. Other notable languages include Tableau, SAS, and MATLAB. This highlights the critical role of Python, SQL, and R in the Australian data science job market, indicating that proficiency in these languages is essential for aspiring data scientists. This information can guide job seekers in prioritizing their skill development to align with market demands.

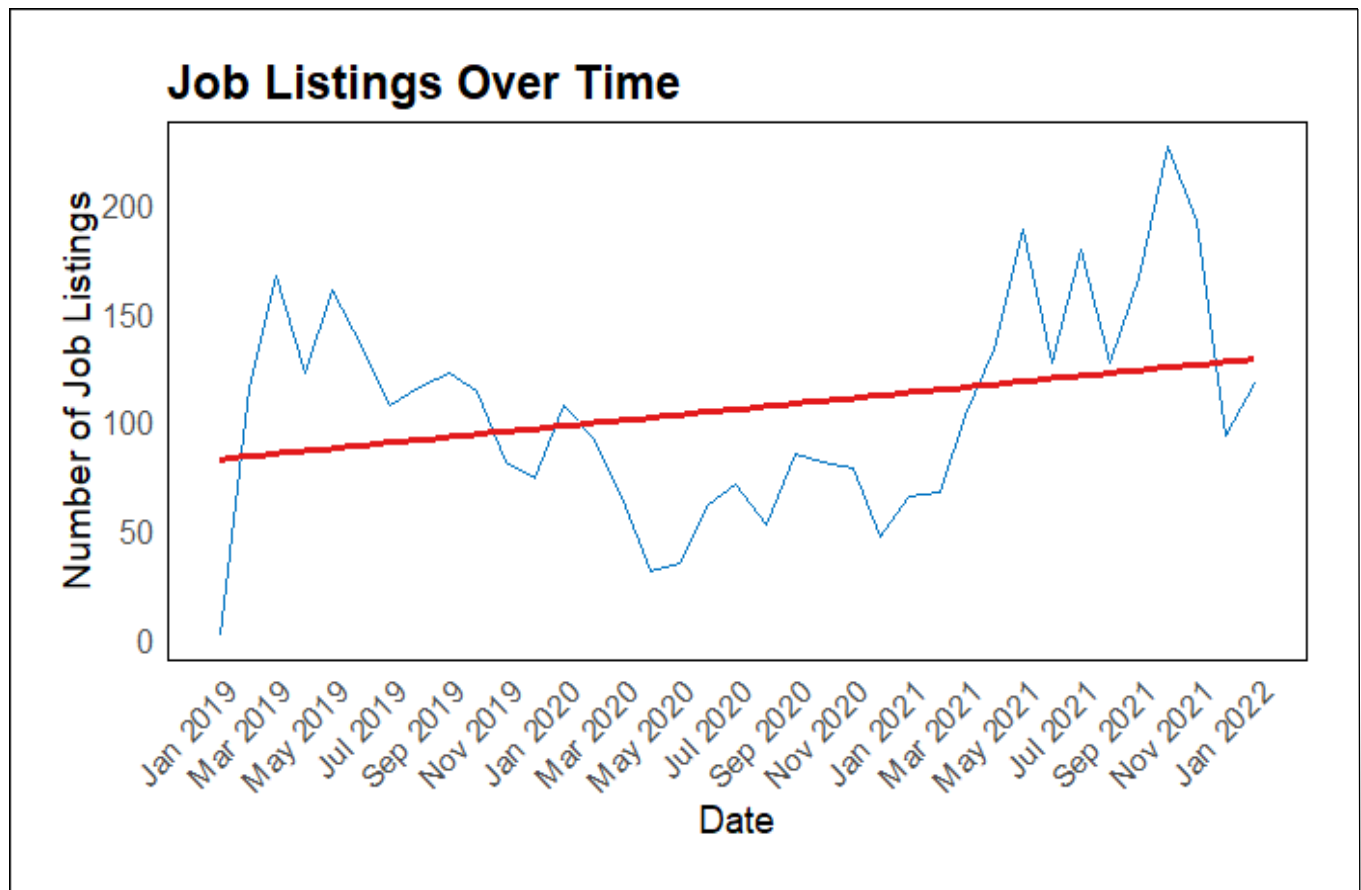


Figure 3: Job Listings Over Time

Understanding the demand for skills is crucial, but it is also important to consider how this demand has evolved over time, the line chart in Figure 3 depicts the trend of data science job listings in Australia over time, from January 2019 to January 2022. This provides insights into the temporal dynamics of the job market. The blue line represents the number of job listings per month, showing significant fluctuations throughout the period. Despite these ups and downs, the red trend line indicates a steady overall increase in job listings. Notable peaks can be observed around mid-2021, suggesting a rise in demand for data science professionals during that time. This upward trend highlights the growing importance and demand for data science roles in the Australian job market, emphasizing the field's expanding opportunities over the years.

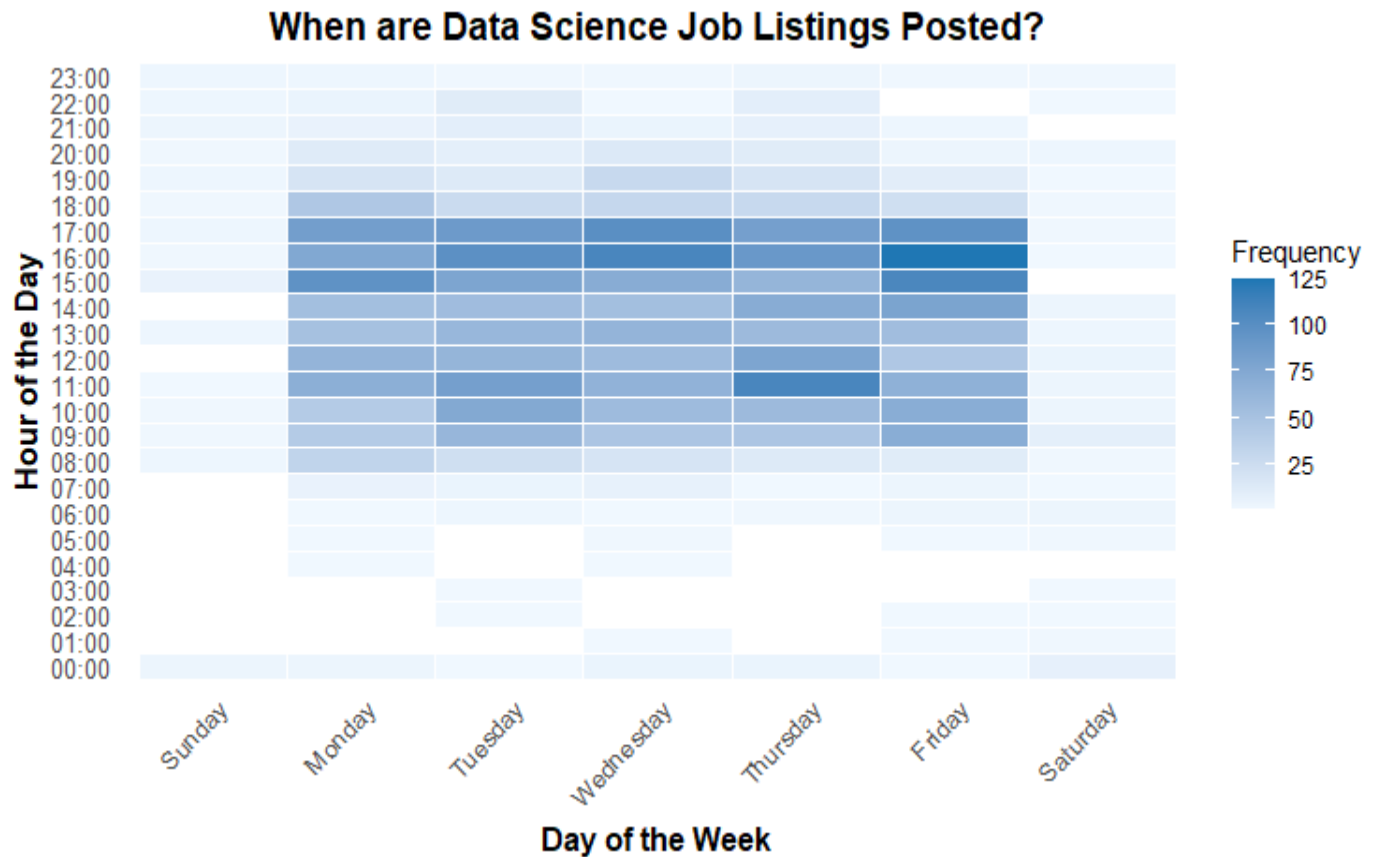


Figure 4: Heat Map of Data Science Job Listings Posted

To further understand the dynamics of job postings, the heat map in Figure 4 illustrates the timing of data science job postings throughout the week, highlighting the frequency of postings by day and hour. The darker shades indicate higher frequencies of job listings. The data reveals that most job listings are posted between 9 AM and 6 PM from Monday to Friday, with a noticeable concentration around 3 PM to 5 PM, with Thursday and Friday showing the highest activity. Understanding these patterns and peak times for job postings can be crucial for job seekers aiming to optimize their application timing, providing valuable insights on when to monitor and apply for new opportunities.

## Job listing per 100k population

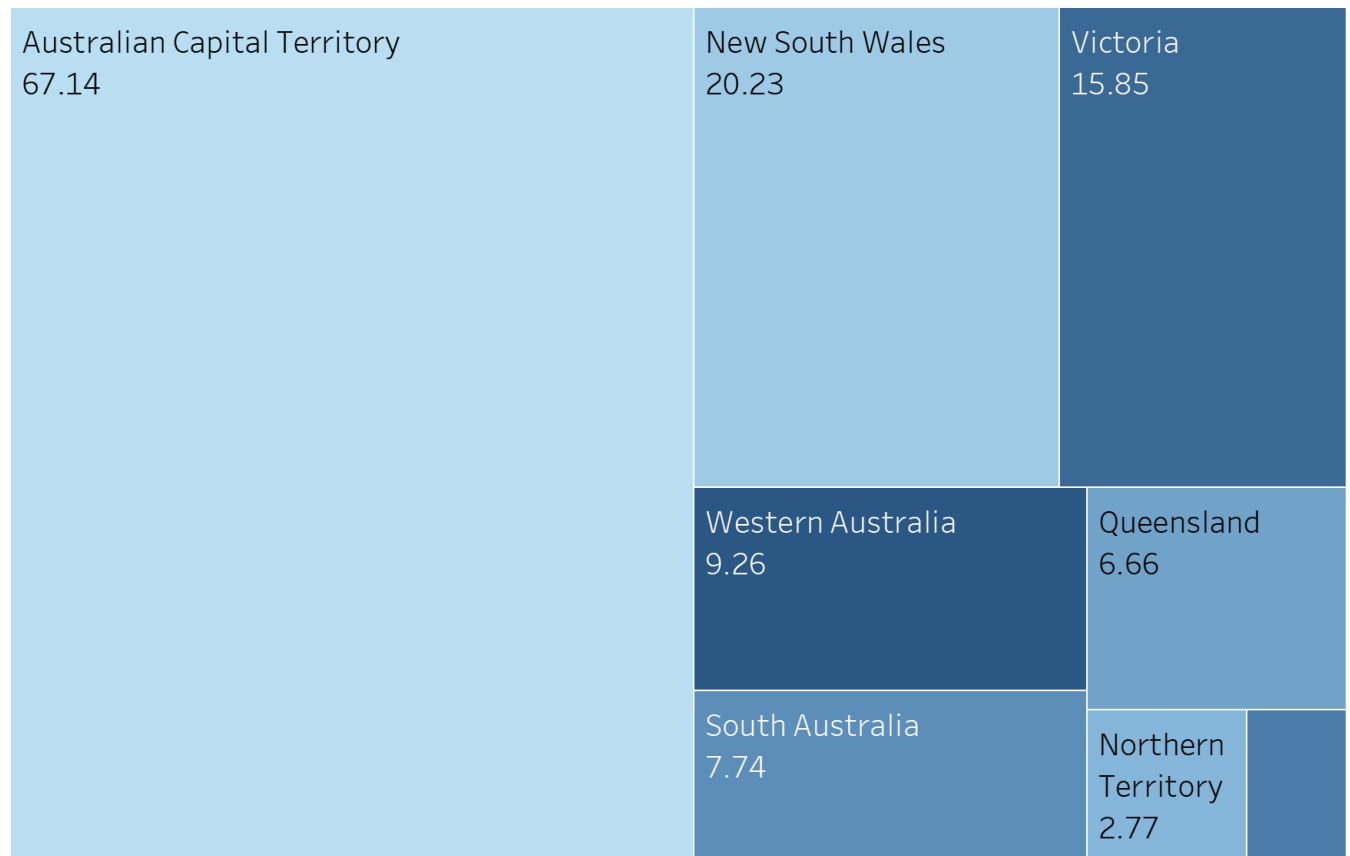


Figure 5: Job listing per 100k population

Looking at the relationship between job listings and population, the tree map visualization in Figure 5 displays the number of data science job listings per 100k population across various Australian states and territories. This normalization with state populations offers a deeper understanding of job opportunities relative to population density. Interestingly, the Australian Capital Territory (ACT) leads significantly with 67.14 job listings per 100k population, highlighting a high concentration of opportunities relative to its population size. New South Wales (20.23) and Victoria (15.85) follow, indicating strong demand in these populous states. Western Australia (9.26), South Australia (7.74), and Queensland (6.66) show moderate levels, while the Northern Territory has the lowest density at 2.77 listings per 100k population. This visualization underscores the regional disparities in job availability, emphasizing the prominence of ACT and major states like NSW and Victoria in the data science job market.



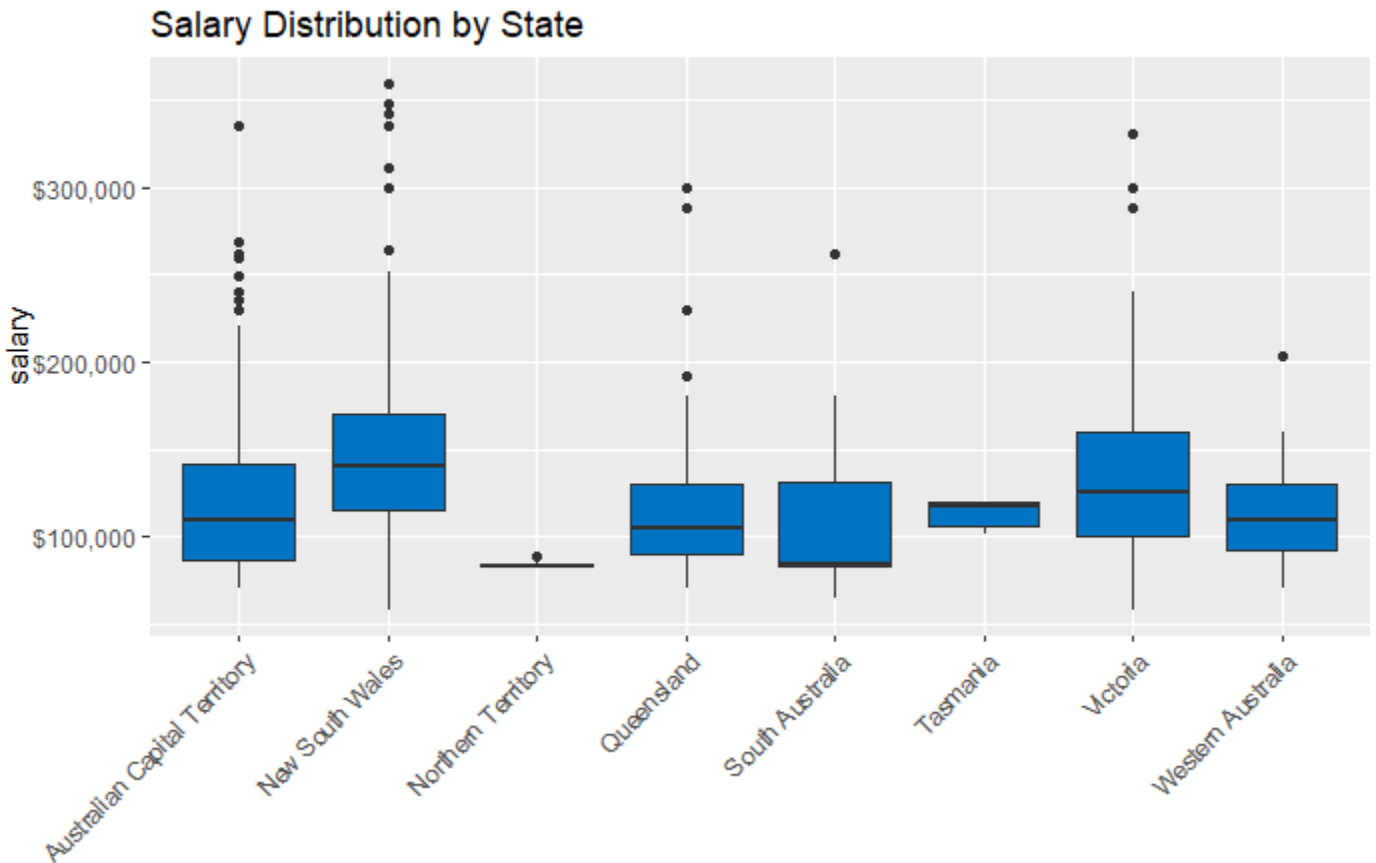


Figure 6: Salary Distribution by State

Turning to salary comparisons, the box plot in Figure 6 provides a comparison of salary distributions for data science jobs across various Australian states. It is apparent that Victoria has the highest variability in salary for data science jobs, surpassing that of other states, followed by New South Wales. Conversely, the Northern Territory exhibits less variability in salary compared to other states. Outliers are observed across all states, indicating instances of exceptionally high or low salaries. Based on this analysis, Victoria appears to have the highest average salary with the greatest variability, suggesting a wide range of salary offerings for data science roles in the state. In contrast, the Northern Territory has a comparatively lower average salary with less variability. This visualization highlights regional differences in compensation, providing valuable insights for job seekers considering relocation or salary negotiations.

## Correlation Matrix

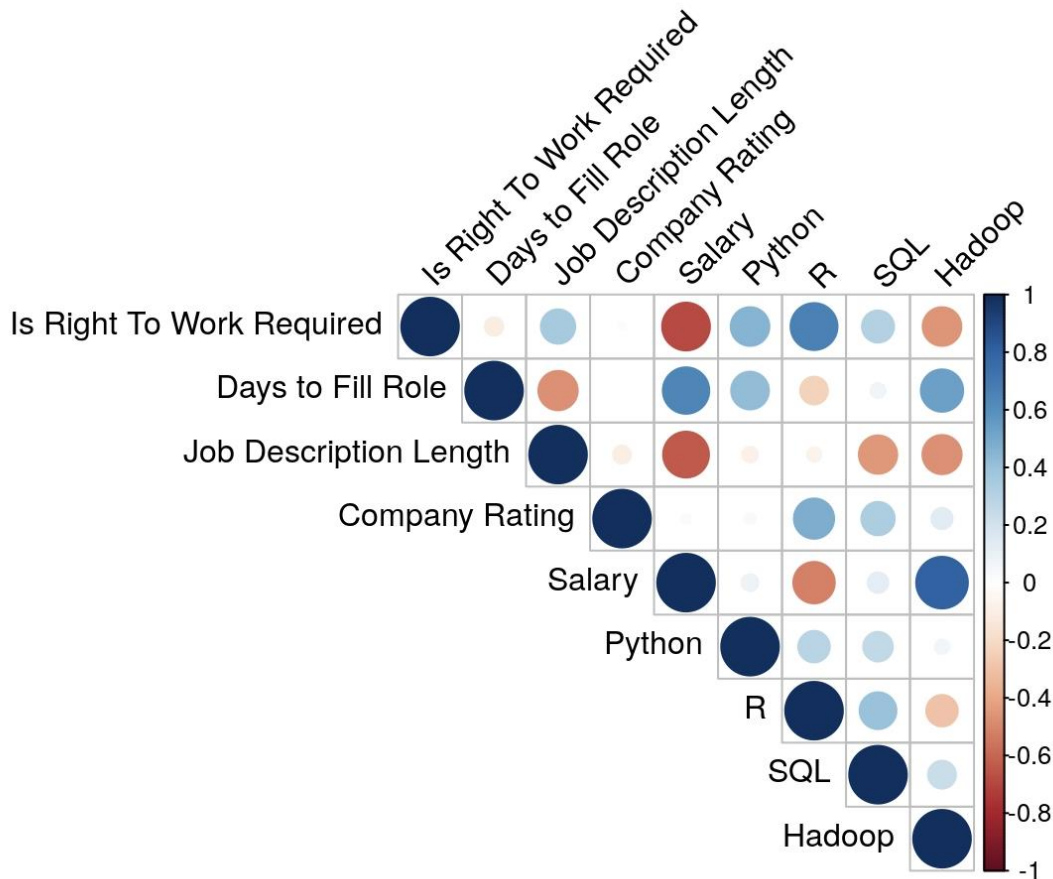


Figure 7: Correlation matrix

Examining the relationships between various factors in job listings, the correlation matrix in Figure 7 highlights the relationships between various factors in data science job listings, using color and size to represent the strength and direction of correlations. Darker and larger circles indicate stronger correlations, with blue signifying positive correlations and red indicating negative correlations. The matrix reveals that both Python and R jobs are positively correlated with salary, indicating higher demand for these skills is associated with better pay. Additionally, companies that offer lower salaries tend to have poorer ratings. Interestingly, while R jobs are positively correlated with company ratings, they are negatively correlated with salary, suggesting that R positions may be slightly lower-paid but are often found at reputable companies. This matrix provides valuable insights into how different job listing attributes are interrelated, guiding job seekers in understanding critical factors influencing job postings and making informed career decisions.

## Common terms in Job listings teaser



Figure 8: Word Cloud

Finally, the word cloud in Figure 8 visualizes the most common terms found in the teasers of data science job listings. Prominent terms such as "Data," "Scientist," "team," "opportunity," and "business" indicate key focus areas and priorities within the job listings, emphasizing teamwork and business opportunities. Additionally, words like "analytics," "solutions," "insights," and "learning" reflect the core responsibilities and skills associated with these positions. This underscores the importance of these keywords, suggesting that job seekers should emphasize these terms in their applications to align with employer expectations and improve their chances of securing data science roles.

## Conclusions

To conclude, the analysis of data science job listings across Australia highlights key trends and insights valuable to both job seekers and current professionals looking for transitions. New South Wales stands out as the primary hub for data science opportunities, with the highest number of job listings, followed by Victoria and Queensland. The demand for programming languages such as Python, SQL, and R is notably high, indicating that proficiency in these languages is essential for aspiring data scientists. Temporal trends show a growing overall demand for data science roles and a higher frequency of job postings during weekdays, particularly between 9 AM and 6 PM.

Regional disparities in job availability and salary distributions are also evident. The Australian Capital Territory has the highest concentration of job listings relative to its population, while Victoria shows the highest salary variability and average salary for data science jobs. Skills in Python and R are associated with higher salaries and better company ratings. Key terms such as "Data," "Scientist," "team," and "opportunity" are frequently mentioned in job listings, reflecting core responsibilities and desired attributes.

Overall, this comprehensive analysis provides a detailed understanding of the data science job market in Australia, offering valuable insights into geographic trends, skill demands, temporal dynamics, regional disparities, salary distributions and key job attributes. These findings guide job seekers in skill development, application timing and strategic career decisions in the field of data science.

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