

URL To Visualisation on GitHub:

<https://dliu00049.github.io/FIT3179/>

URL To Five Design Sheets:

https://github.com/dliu00049/FIT3179/blob/main/DesignSheets/Daniel_Liu_5_Design_Sheets.pdf

Domain:

The domain of my visualisation is the patterns in Australia's weather across different states and the entirety of Australia, which is captured through features like temperature, sunshine hours, wind speed, rainfall and humidity.

What?

I used two datasets, both of which were of **tabular format** such that the data was arranged in rows and columns.

The data mainly came from:

<https://www.kaggle.com/datasets/nadzmiagthomas/australia-weather-data-2000-2024/data>

Some data that was missing had to be pulled from the Open Meteo API:

<https://github.com/open-meteo/open-meteo>

The processing of the datasets can be found in the following notebooks on GitHub:

<https://github.com/dliu00049/FIT3179/tree/main/notebooks>

The final, clean datasets I used to create the visualisations can be found here:

<https://github.com/dliu00049/FIT3179/tree/main/data>

Why & Who?

The dashboard explores Australia's weather patterns throughout the different months in 2023, highlighting the changes to temperature and rainfall in different states, across different seasons. It provides insight for tourists who may be concerned about weather conditions in certain regions of Australia during the planning stages of a holiday, the agricultural industry who may require details surrounding weather patterns for understanding the risks associated with farming in certain locations of Australia and emergency services who may seek weather data to identify areas at most risk of natural disasters like bushfires.

How?

I designed the visualisation to guide users through Australia's weather patterns by starting with the overall weather across Australia, followed by a comparison of weather between states.

Firstly, I used a proportional symbol map as I had longitude and latitude data associated with weather recordings from different weather stations across Australia. Despite the large number of dots, the map serves its purpose of showing the general distribution of temperature across different Australian regions, drilling down into specific suburbs which would be difficult with a choropleth map.

Next, I used streamgraphs to represent the change in temperature and rainfall by season, which showed distinct patterns for summer and winter months (peaks and troughs). A streamgraph was ideal for visualising the combined trend in temperature and rainfall for different states across time. This visualisation was custom-built in vega-lite, where I had to build out the annotations with an arrow using text and shapes.

Next, I used interactive donut charts to represent the proportional contribution to rainfall and temperature by state in 2023. The donut chart is ideal for drilling down into specific numerical contribution to total temperature and rainfall by each individual state, for each month in the streamgraph. This visualisation was custom-built in vega, where I had to incorporate animations and annotations for numerical figures, in addition to the month filter.

Finally, I used a bubble chart to explore the relationship between temperature, rainfall and humidity across the states of Australia. The bubble chart highlights the distinctive clusters, with each cluster providing additional information about the combination of temperature, rainfall and humidity for each state. This visualisation was custom-built in vega-lite, where I had to incorporate annotations with the arrow using text and shapes, and implemented three filters.