Data exploration: the entry and exit of international people from major countries with close ties with Australia

Indexes

Introduction

Motivation:

I am an international student. I come from China. I want to come to Australia for study, but the expensive air tickets and various complicated epidemic prevention policies lead me to choose online study. I know the impact of the pandemic has been huge around the world, including in Australia. So, I want to find out how many international people have come to Australia under the global epidemic situation.

Question:

1. What are the top ten countries for international arrivals to Australia in 2021?
2. In recent years, what are the purposes of international people from these 10 countries entering and leaving Australia?
3. What has been the change in the number of international people arriving in Australian provinces in recent years?

Problem description:

First of all, because of the global outbreak of COVID-19 in 2020, countries adopted different policies to block their borders. Thus, affecting the number of people entering and leaving Australia and the purpose of personnel. In 2020, the entry and exit of international personnel from 10 countries with close international exchanges with Australia were affected. Therefore, in order to find out the impact degree or the situation before and after the impact. These issues were formulated. Obtain the entry-exit information collected by the Australian government, and make corresponding charts for sorting and analysis to draw conclusions.

Data Wrangling

There are two sources for my data:

The first dataset comes from Overseas Travel Statistics from the Australian Bureau of Statistics, Provisional 1.3 All Arrivals-Top 10 Countries of Citizenship - Provisional Estimates (A) and 1.5 All arrivals - State or Territory of clearance - provisional estimates(a) (Overseas Travel Statistics, Provisional, 2021).

1.3 All Arrivals-Top 10 Countries of Citizenship - Provisional Estimates (A) (Overseas Travel Statistics, Provisional, 2021) provide Monthly Arrivals from Top 10 major source Countries of non-Australian internationals to Australia from June 2019 to June 2021.

1.5 All Arrivals - State or Territory of Clearance - Provisional Estimates (a) (Overseas Travel Statistics, Provisional, 2021). It provides the number of incoming international arrivals to Australian states from June 2019 to June 2021.

Due to the small amount of data in these three tables, I chose to use EXCEL software to clean the data and delete the NA value and comments.

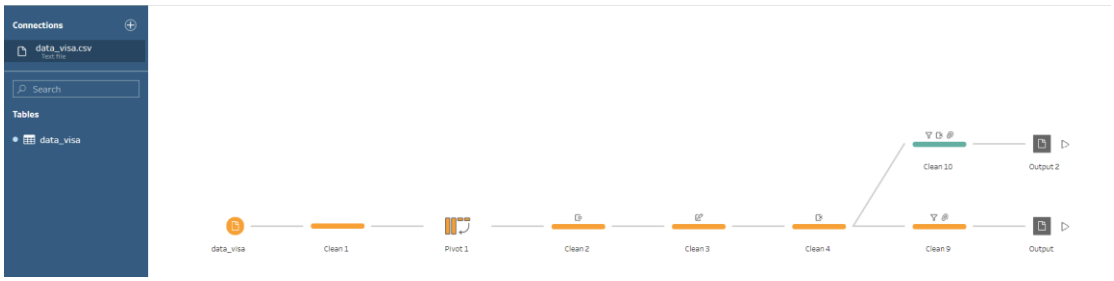


Figure 1. data_visa wrangling

Note. BP0022-overseas-arrivals-and-departures-locked-2021-22-to-2022-05-31.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

And the other data set is from the XLSX table of BP0022-overseas-arrivals-and-departures-locked-2021-22-to-2022-05-31(Overseas Arrivals and Departures, 2022). Because of the particularity of this table, I could not directly obtain the data, so I manually climbed the data needed and used Tableau Prep for data cleaning. The name of the file I grabbed to store the data is data_visa. I used the data_visa file to screen out the data of different purposes from July 2021 to May 2022 from ten major countries in Australia, with 5000 lines of data.

I first used an Excel spreadsheet to assign the null value to 0, canceling the <5; Change the data format of <5 to integer format. According to Picture 1, I used Tableau Prep to classify and reorganize different categories of data. The horizontal list was changed into vertical row, the total category was removed, and the data was divided into the visa purposes for ten countries.csv.

Data Checking

Because dataset 1.3 All Arrivals-Top 10 Countries of Citizenship-Provisional Estimates (A) and 1.5 All Arrivals-State or Territory of Clearance - Provisional Estimates (A) data volume is very small (Overseas Travel Statistics, Provisional, 2021). I used Excel to check whether the data met the requirements, whether the data was empty, whether the data had duplication and other problems.

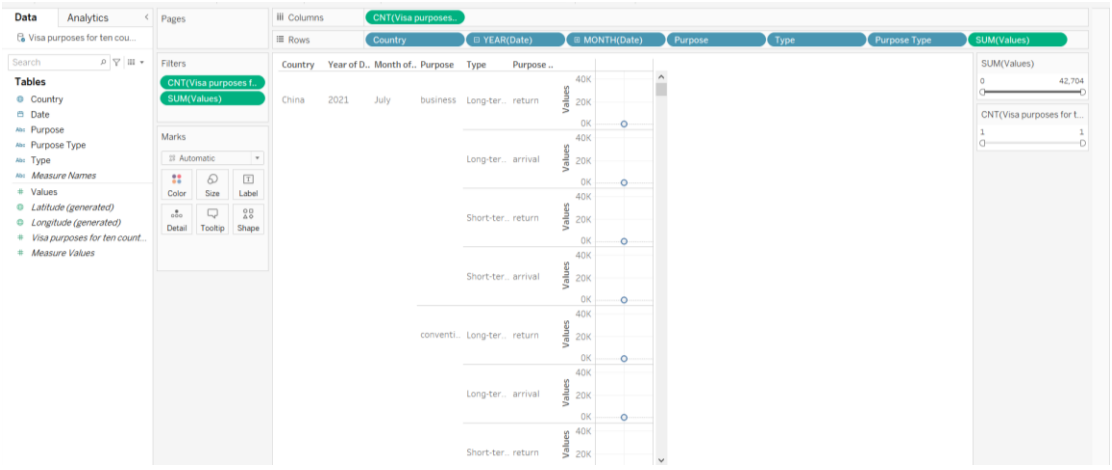


Figure 2. visa purposes for ten countries checking null and same values

Note. visa purposes for ten countries.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

As shown in Figure 2, I use Tableau to check whether null values appear in the table Visa Purposes for Ten Countries and check for duplicate values. It is found that there are no null values and duplicate values in the data.

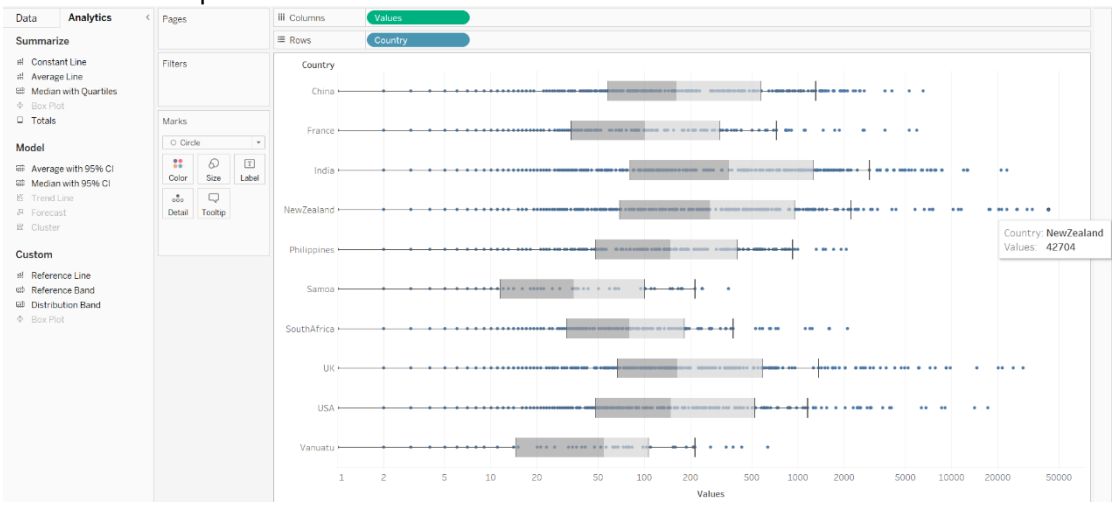


Figure 3. visa purposes for ten countries checking outliers

Note. visa purposes for ten countries.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

As Figure 3 shows, when I detect outliers, I find that there are some values of 0 and some special values for each country. Although these values are far beyond the reasonable range given by the software, they are correct. The main data I have collected is the number of people coming to Australia from the top ten countries between May 2020 and July 2021. Due

to different quarantine policies and changes in entry requirements in each country, the data in different months were extreme. In addition, due to the screening of international persons for different purposes, the number of international persons entering Australia for a particular purpose during this period may be 0. The high number is due to factors such as changes in quarantine policies that have made it easier to enter Australia in recent months. To sum up, I think these values are in line with the requirements.

Data Exploration

Figure 4. Top 10 countries for international arrivals in Australia in 2021

Note. 1.5 All arrivals - State or Territory of clearance - provisional estimates(a).csv (https://www.abs.gov.au/statistics/industry/tourism-and-transport/overseas-travel-statistics-provisional/jun-2021)

I use Tableau to import the data of 1.5 All arrivals - State or Territory of clearance - provisional estimates(a) (Overseas Travel Statistics, Provisional, 2021).

And select the style of the map, assign a value and drag to generate two maps, use the makepoint method to set the starting point and ending point, merge the two maps and choose to display them in 2021. According to Figure 4, it can be seen from the data that the ten major countries in 2021 in order of number from largest to smallest are New Zealand, the United Kingdom, China, India, the United States, the Philippines, Vanuatu, Samoa, France and South Africa. Among them, New Zealand has the largest number of international people with 43,780, while South Africa has the smallest number of international people with 370. The total number of arrivals from these ten countries in 2021 was 53,870.

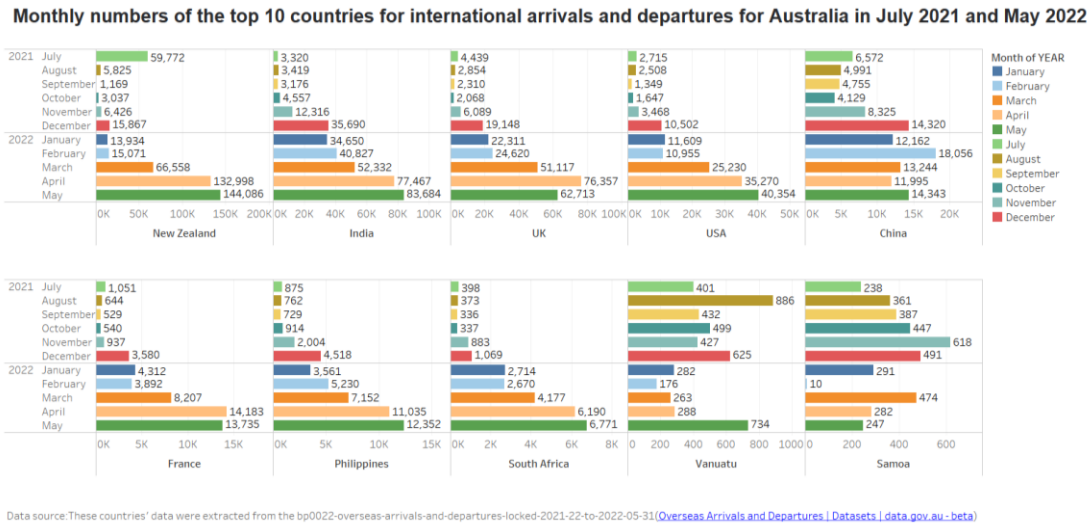


Figure 5. Monthly numbers of the top 10 countries for international arrivals and departures for Australia in July 2021 and May 2022

Note. visa purposes for ten countries.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

I use Tableau to apply visa purposes for ten countries.csv data (Overseas Travel Statistics, Provisional, 2021). And I use the sum function to calculate the total number of people in each country, drag the year into rows, and then decompose the month. According to Figure 5, we can see that from July 2021 to May 2022, the number of visitors from the top 10 countries to Australia was on the rise. The number of New Zealanders arriving in Australia increased the most from a low of 1,169 in September 2021 to 144,086 in May 2022. The smallest increase was in Samoa. The most stable relative number is Vanuatu. The data for India, the UK, the US, France, the Philippines, and South Africa show a similar trend, with smaller and stable data for these countries from July to November 2021 and an increase from December 2021 to February 2022, a period of relatively stable data, followed by a large increase from March to May 2022. However, the growth rate of China is not much, and the number of people decreased in April and May 2022, which is obviously different from the development trend of the United States, the United Kingdom, India, New Zealand, and France. This shows a clear difference between China's international policies and those of other superpowers. But taking all the data together, the number of international visitors to Australia from ten major countries has increased gradually over time.

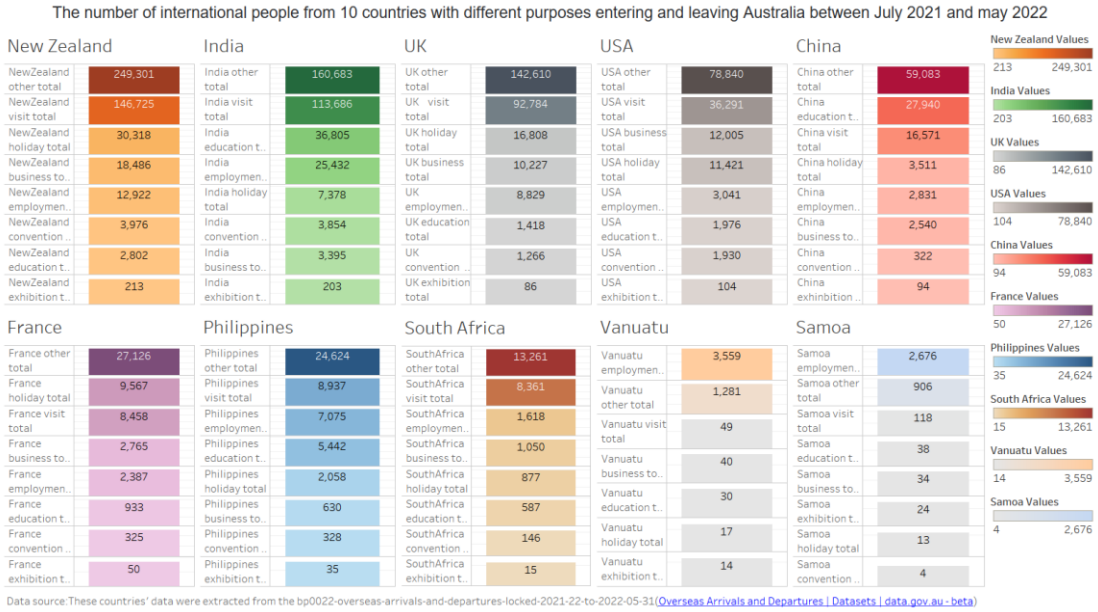
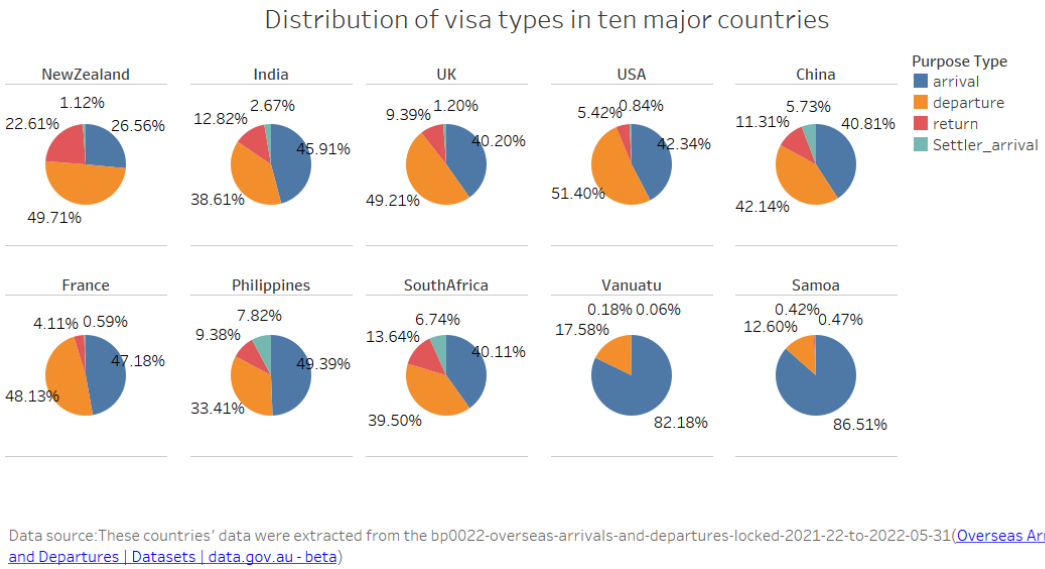


Figure 6. The number of international people from 10 countries with different purposes entering and leaving Australia between July 2021 and may 2022

Note. visa purposes for ten countries.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

I use Tableau to apply visa purposes for ten countries.csv data (Overseas Arrivals and Departures, 2022). And I use sum function to calculate the total number of people in different

destinations in each country, sort from large to small, and put different tables in ten countries into dashboard to generate pictures. According to the data in Figure 6, we can find that other countries except Vanuatu and Samoa have the largest number of people, and the least is exhibition. Other in New Zealand has the highest number of all data, with 249,301 visits. The smallest number, however, was from Samoa, who went to Australia for meetings, with only four. And from the data in the chart, it is found that the students who come to study in Australia are mainly from India and China. In particular, Vanuatu and Samoa account for the largest proportion of people from their countries coming to Australia looking for work were 3,559 and 2,676 people looking for work in Australia.



Data source:These countries' data were extracted from the bp0022-overseas-arrivals-and-departures-locked-2021-22-to-2022-05-31(Overseas Arrivals and Departures | Datasets | data.gov.au - beta)

Figure 7. Distribution of visa types in ten major countries

Note. visa purposes for ten countries.csv (https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics)

I use tableau to apply visa purposes for ten countries.csv data (Overseas Arrivals and Departures, 2022). And I put the calculated total value into rows, drag the country name into columns, select sector chart, and select the percent of total option to display the percentage. Finally, adjust the display position. As can be seen from the data in Figure 7, Samoa and Vanuatu have the lowest proportion of international people leaving Australia, only 12.6% and 17.58% respectively, while the proportion of international people coming to Australia is 86.51% and 82.18% respectively. The proportion of international people coming to Australia is much higher than the proportion leaving. It follows that internationals from these two countries may prefer to come to Australia rather than leave. The UK, US, New Zealand, and France had high numbers and percentages of people leaving Australia (49.21%, 51.4%, 49.71% and 48.13% respectively), so these countries may be more likely to return home than to stay in Australia compared to Samoa and Vanuatu.

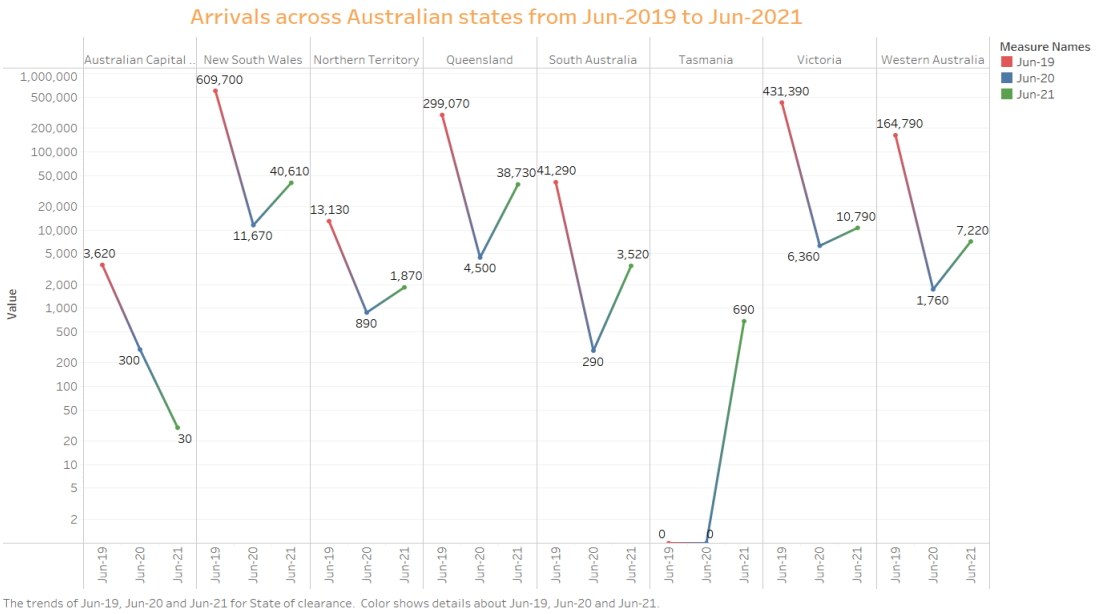


Figure 8. Arrivals across Australian states from Jun-2019 to Jun-2021

Note. 1.3 all arrivals top 10 countries of Urbanization - provincial estimates (a) (https://www.abs.gov.au/statistics/industry/tourism-and-transport/overseas-travel-statistics-provisional/jun-2021)

I use tableau to set 1.3 all arrivals top 10 countries of Urbanization - provincial estimates (a).csv data (Overseas Travel Statistics, Provisional, 2021). And drag the value into rows, put the state name in columns, select the line chart and design the color. According to Figure 8, we can find the number of international visitors to each state of Australia from 2019 to 2021. As can be seen from the data, 2019 was not affected by the international pandemic, with far more visitors per state than in 2020 and 2021. Of the Australian states, New South Wales had the highest number of international visitors in 2019, while Tasmania had the least. In addition, the number of international tourists started to rise in June 2021 and June 2020 in all states except the Australian Capital Territory. This partly reflects the gradual recovery of international travel.

Conclusion

I learned from the data. First, it can be found in Figure 4 that the most international people entering Australia come from New Zealand. According to the data in Figure 5, the number of international people entering Australia from New Zealand increases over time. It can be reasonably speculated that the international exchanges between New Zealand and Australia are gradually opening, and it can be seen from Figure 5 that the number of entry and exit of other major countries is also gradually increasing. It is also evidence that international communication between Australia and other major countries is becoming easier. However, according to the data shown in Figure 8, compared with the number of international people in each state of Australia before the global pandemic, the number of international people coming to Australia has not recovered to the level of 2019 before the pandemic. In terms of the purpose of entry and exit, there are many similarities and differences among the 10 countries. Excluding the other categories, the developed countries such as New Zealand, Britain, the United States and France mainly visit friends and have holidays. Among the developing countries, China and India are more likely to study abroad. Vanuatu and Samoa have the highest number of employments. From these data, it can be reasonably inferred that developed countries prefer to visit their relatives and friends in Australia, while China and India are the two countries with the largest number of students. This trend can also be seen from Figure 7, that is, the number of people leaving from developed countries is about 50%, while China has the highest rate of leaving from developing countries (42.14%). Because the main purpose of China is to study abroad rather than employment, the purpose of leaving the country is particularly low. Vanuatu and Samoa, on the other hand, have very low departure rates of 17.58 percent and 12.6 percent, respectively, due to the long hours of employment, and very high entry rates of more than 80 percent.

So, the answer to my first question is New Zealand, India, Britain, the United States, China, France, the Philippines, South Africa, Vanuatu, and Samoa

So, the answer to my second question is that most international people in New Zealand, Britain, the United States and France mainly visit relatives and travel, India mainly visit relatives and study abroad, China mainly study abroad, the Philippines and South Africa mainly visit relatives and work, and Vanuatu and Samoa mainly work.

The answer to my third question is that the number of people entering Australia in 2020 was far less than that in 2019 due to the restrictions of the exit and entry policies. The number of people entering Australia rose significantly in 2021, but the data of Australian Capital state was still declining. However, the number of people entering Australia in 2021 has not recovered to the level of 2019.

Reflection

In the data cleaning phase of this project, I learned how to use tableau prep to switch rows and columns of data and separate data. I learned to use Excel tables to batch process null values and format cells.

In the drawing stage, I learned how to use tableau to create a flow map and how to use a fan chart to display percentages.

In the analysis stage, I learned how to synthesize the information in different charts and analyze them.

When processing xlsx files later, I can more skillfully use Excel tables to filter data and crawl data, and preliminarily clean the data. Then I can use tableau prep more skillfully to clean up data, such as horizontal and vertical row exchange, data cutting, etc. After that, I can use tableau more skillfully to draw special maps such as flow map. Finally, in data analysis, I can synthesize multiple chart information to get more and more profound analysis results.

Bibliography

References:

[1] Overseas Travel Statistics, Provisional. (2021, July 14). Retrieved September 9, 2022, from https://www.abs.gov.au/statistics/industry/tourism-and-transport/overseas-travel-statistics-provisional/jun-2021

[2] Overseas Arrivals and Departures. (2022, August 25). Retrieved September 9, 2022, from https://data.gov.au/dataset/ds-dga-5a0ab398-c897-4ae3-986d-f94452a165d7/details?q=Overseas%20Statistics