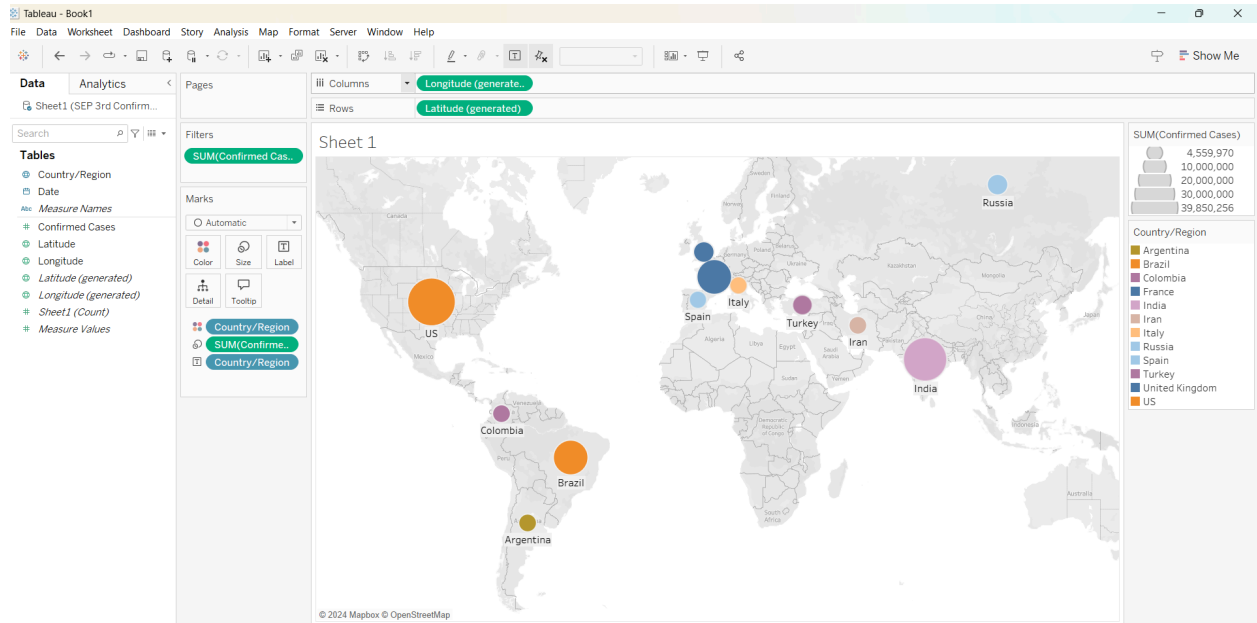
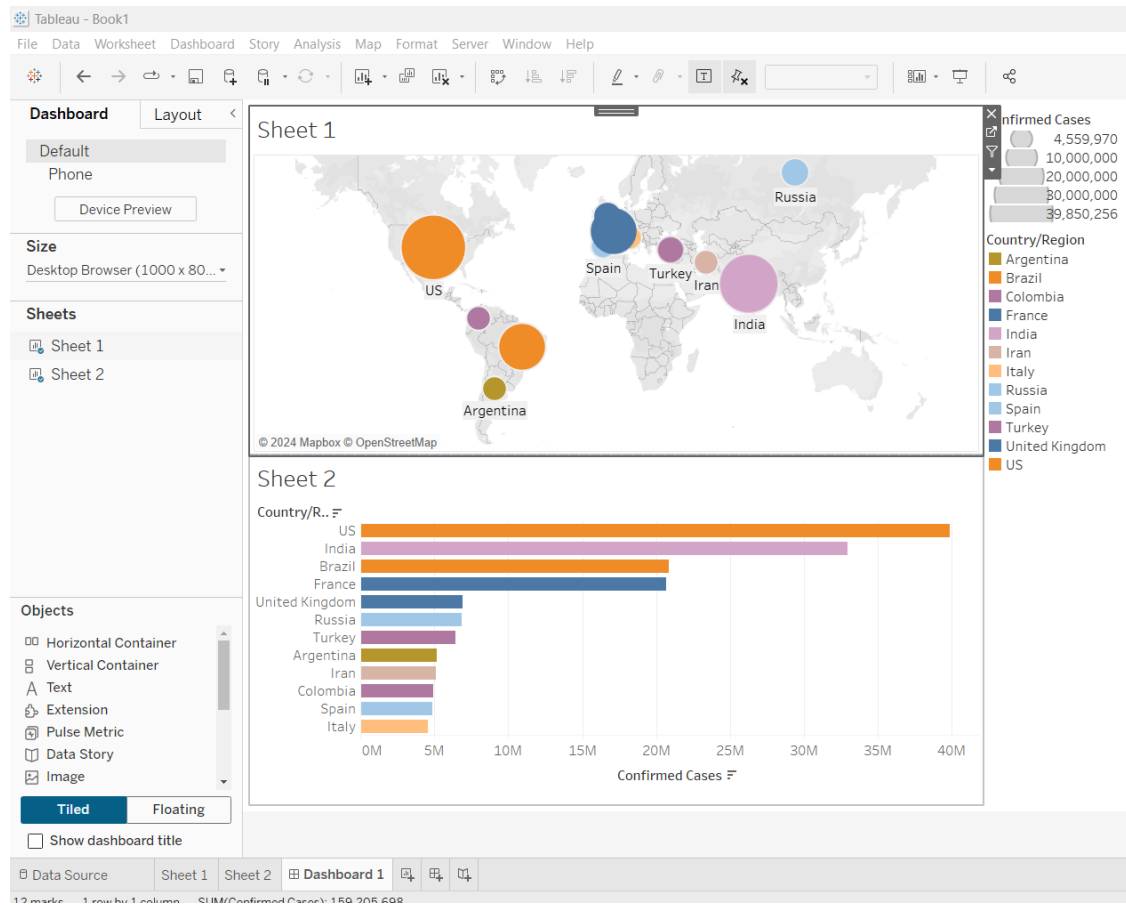


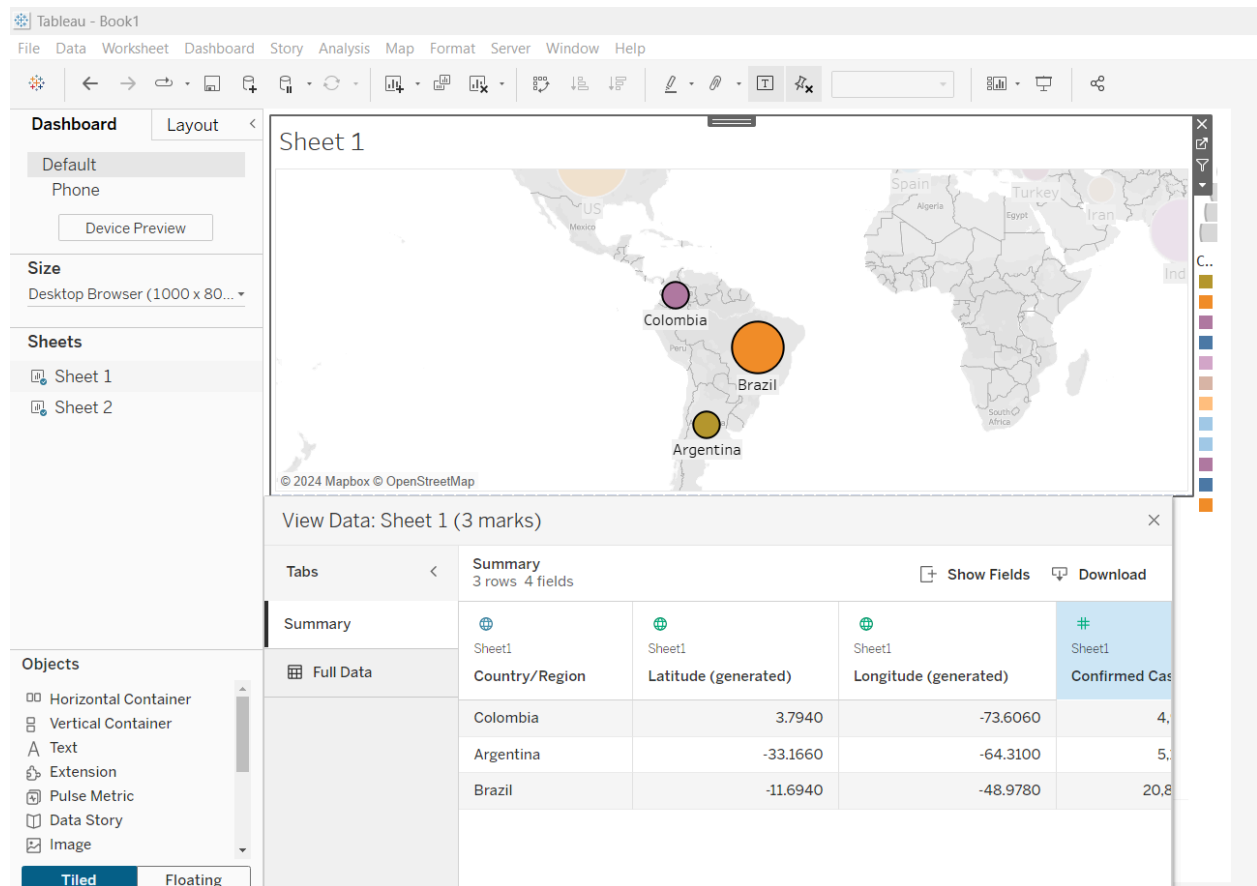
1.2 A



1.2 B



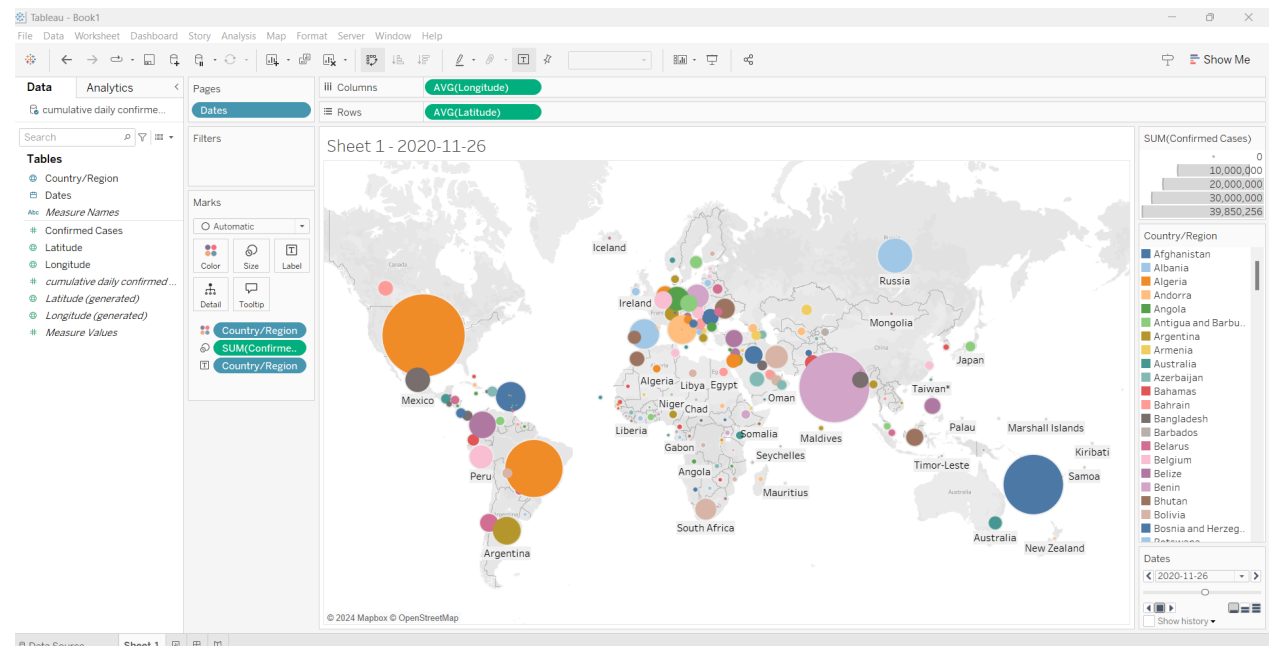
1.2 C



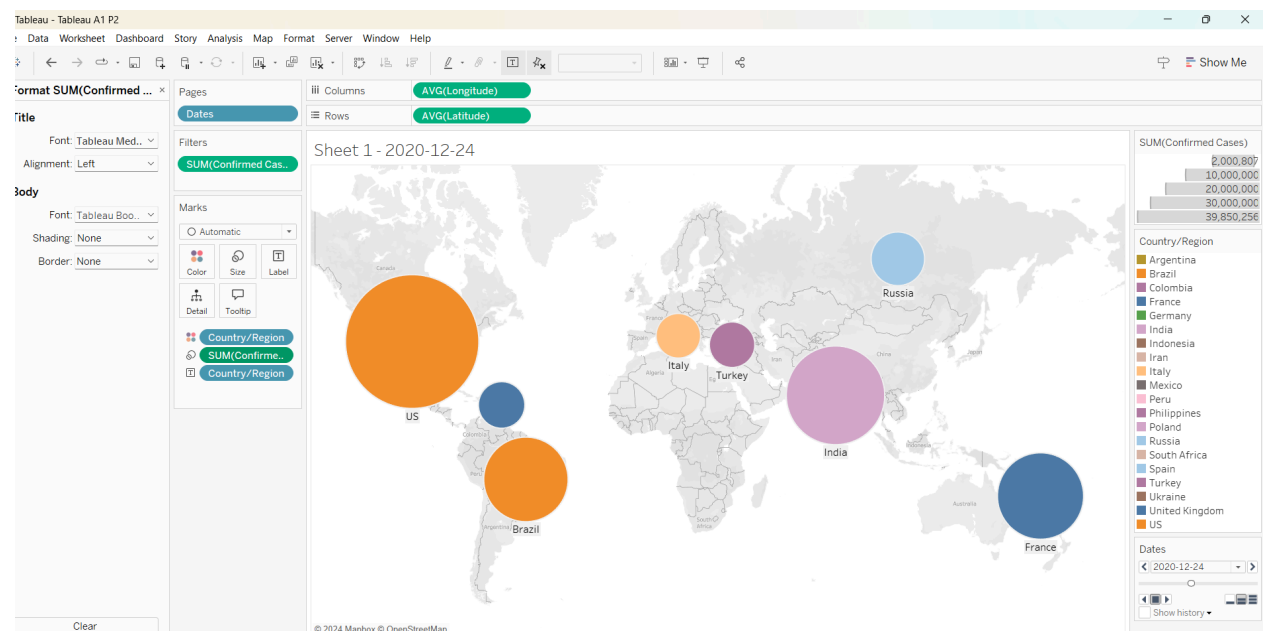
1.2 D

Between January 2020 and September 2021, several of the 10 most populous countries ranked among the 12 countries with the highest number of confirmed COVID-19 cases. Specifically, the United States, India, Brazil, Russia, and Mexico were consistently among the hardest hit. However, populous countries like China, Indonesia, Nigeria, Pakistan, and Bangladesh had lower rankings in terms of confirmed cases.

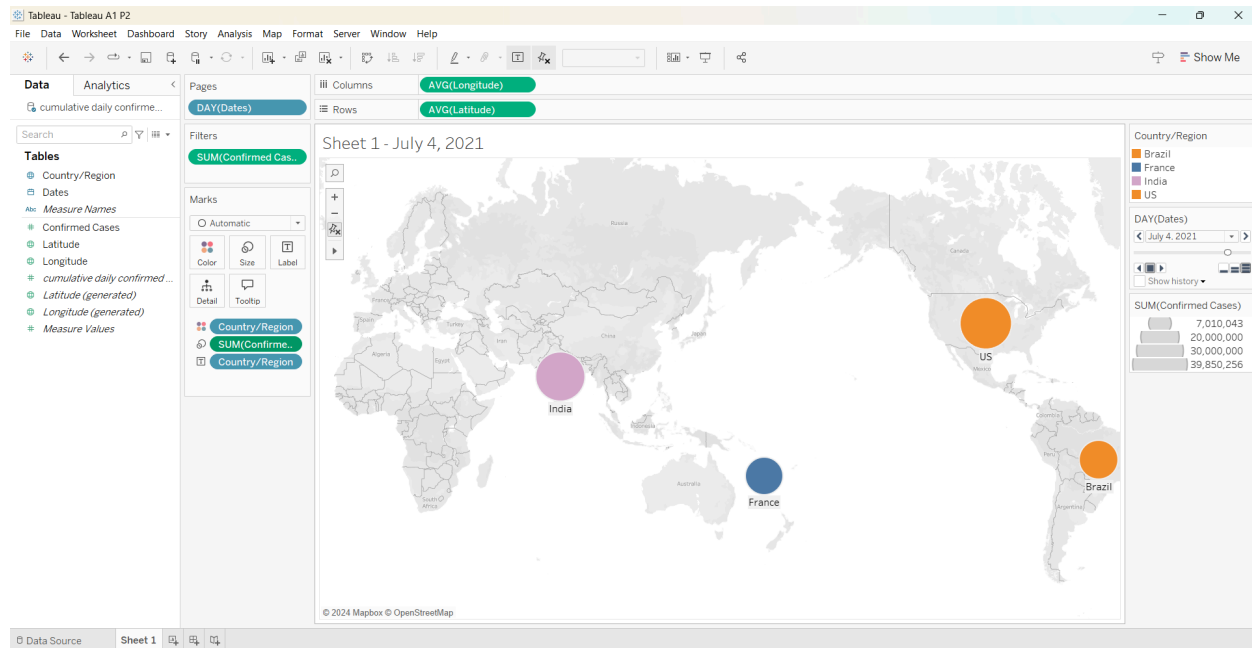
2.1



2.2



2.3



2.4

To compare the number of confirmed COVID-19 cases in the 7 largest countries (Russia, Canada, the United States, China, Brazil, Australia, and India) between January and February 2020 and August and September 2021, there is a stark contrast in terms of the number of cases due to the different phases of the pandemic and the emergence of new variants.

1. January and February 2020: Early Pandemic Phase

China:

January 2020: China reported around ~9,800 confirmed cases at the end of January.

February 2020: By the end of February, China had reached over ~80,000 confirmed cases as it remained the global epicenter.

United States:

January 2020: Fewer than 10 confirmed cases were reported in January.

February 2020: By the end of February, the U.S. had just over 60 confirmed cases. The virus had not yet significantly spread domestically.

India:

January 2020: 1 confirmed case in late January.

February 2020: Less than 3 confirmed cases by the end of February, indicating the virus was still contained.

Brazil:

January 2020: No confirmed cases.

February 2020: Brazil reported its first case in late February 2020, with no major spread during the month.

Russia:

January 2020: Around 2 confirmed cases were reported.

February 2020: Very few cases, with around 3-5 cases confirmed by the end of the month.

Canada:

January 2020: Approximately 3 confirmed cases by the end of January.

February 2020: Less than 20 cases confirmed by the end of February.

Australia:

January 2020: Around 12 confirmed cases.

February 2020: By the end of February, the number of cases in Australia had increased slightly to around 23 confirmed cases.

2. August and September 2021: Delta Variant Surge

China:

August-September 2021: By this time, China had strict containment measures and reported less than 1,500 new cases total in August and September, keeping the overall confirmed cases relatively low.

United States:

August 2021: The U.S. experienced a surge in cases due to the Delta variant, reporting over 4.1 million confirmed cases in August alone.

September 2021: The trend continued with more than 3 million confirmed cases in September, leading to a cumulative total of over 7 million cases during these two months.

India:

August 2021: India, after the devastating second wave, saw around 3 million confirmed cases in August.

September 2021: The number of new cases decreased to around 2.3 million in September, for a total of approximately 5.3 million confirmed cases in these two months.

Brazil:

August 2021: Brazil recorded approximately 1.2 million confirmed cases in August.

September 2021: The number of new cases dropped slightly to around 900,000, making the two-month total around 2.1 million cases.

Russia:

August 2021: Russia reported around 1.7 million confirmed cases.

September 2021: The number of cases remained high with around 1.5 million new cases, resulting in a total of over 3.2 million confirmed cases in August and September.

Canada:

August 2021: Canada recorded around 90,000 confirmed cases in August.

September 2021: Around 75,000 confirmed cases, for a two-month total of around 165,000 cases.

Australia:

August 2021: Australia saw around 50,000 confirmed cases in August due to outbreaks linked to the Delta variant.

September 2021: Another 55,000 cases were reported in September, for a total of 105,000 confirmed cases across the two months.

Statistical Trends: January/February 2020 vs. August/September 2021

China saw the largest number of confirmed cases in early 2020 (due to being the origin of the pandemic), but by August and September 2021, it had very few new cases due to strict lockdowns and containment strategies.

The United States experienced a minimal number of cases in the early months of 2020, but by late 2021, it was one of the worst-hit countries, with over 7 million cases in just two months.

India had only a handful of cases in early 2020 but faced a massive surge by August and September 2021, with over 5 million new cases during this period.

Brazil had no cases at the start of 2020 but became one of the global epicenters in late 2021, recording over 2 million cases in just two months.

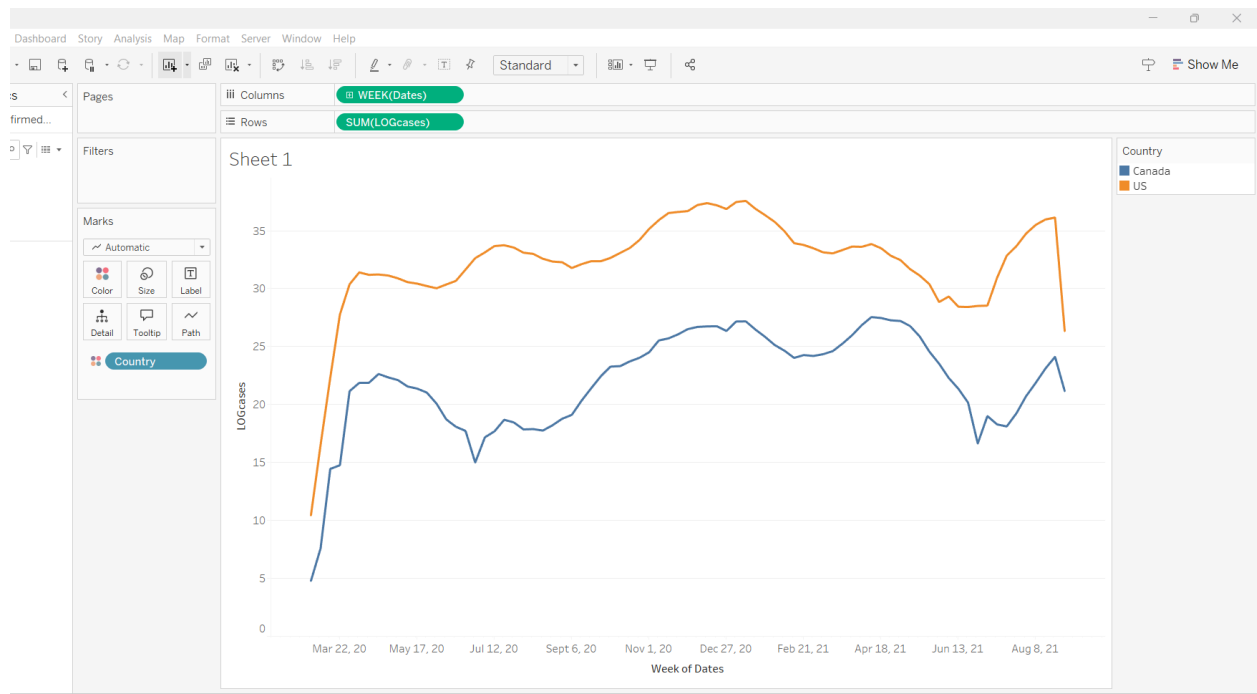
Russia and Canada both had very low case counts in January and February 2020 but saw a significant rise in cases during the Delta variant wave in August and September 2021, with over 3 million in Russia and 165,000 in Canada.

Australia, which had largely avoided the worst of the pandemic in 2020, faced a significant rise in cases in 2021 due to the Delta variant, going from less than 50 cases in early 2020 to over 100,000 cases in August and September 2021.

Conclusion:

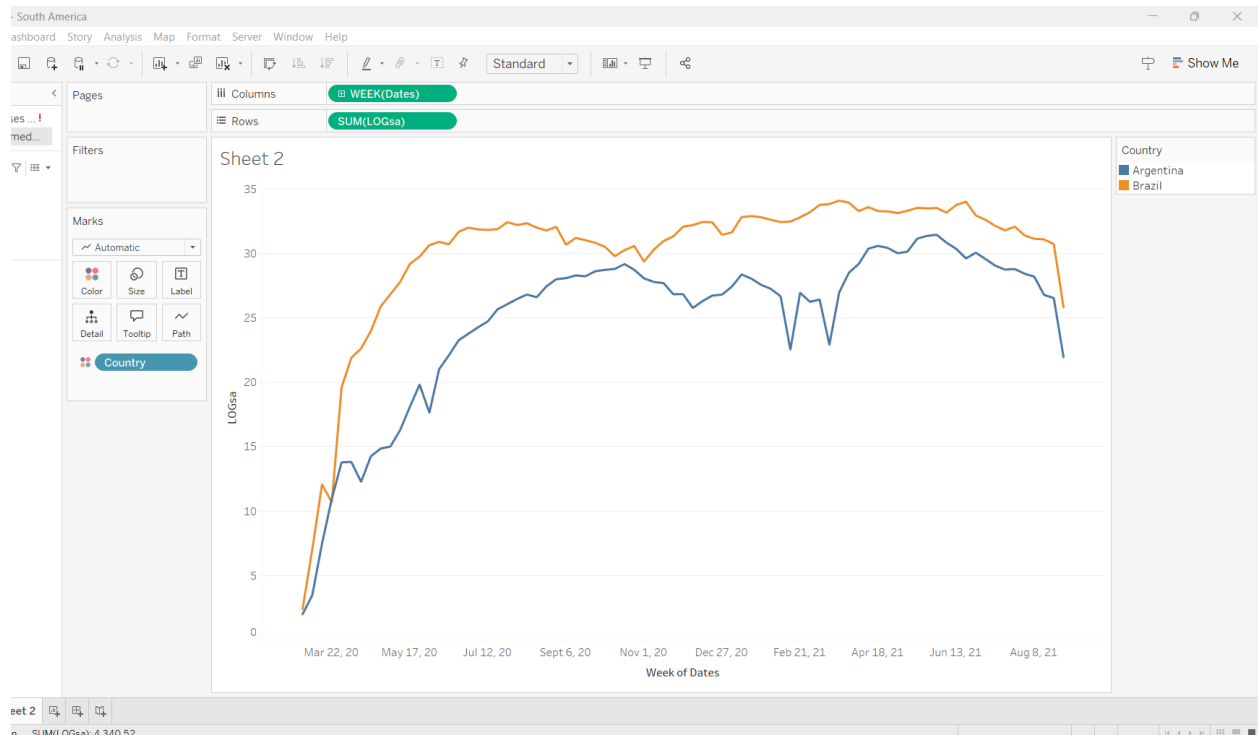
In January and February 2020, COVID-19 was mainly concentrated in China, with minimal spread to other countries. By August and September 2021, the Delta variant caused a major resurgence of cases worldwide, with significant spikes in countries like the U.S., India, Brazil, and Russia. China managed to keep its case numbers low, while countries like Australia, which initially avoided large outbreaks, saw substantial increases. The scale of the pandemic was much larger in 2021 compared to early 2020, highlighting the global nature of the Delta wave.

3.1



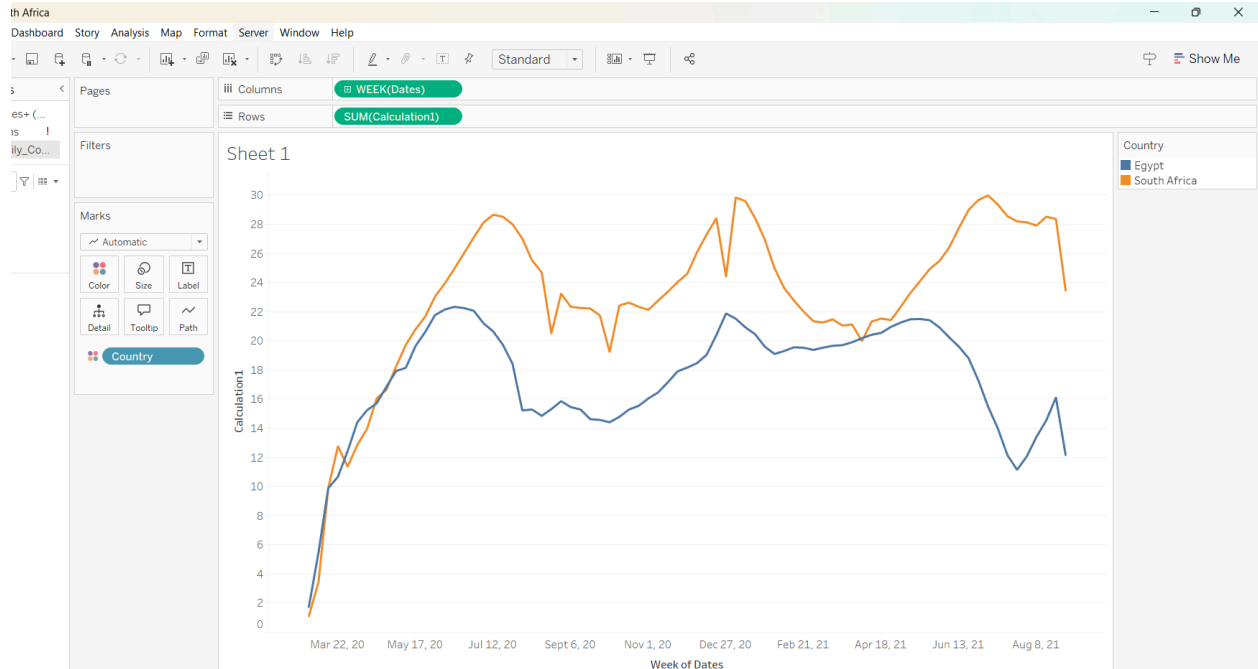
North America

- The first wave: March 1, 2020 to April 19, 2020 approximately
Second wave: June 28, 2020 to Jan 10, 2021 approximately
Third wave: June 07, 2021 to August 22, 2021
- US all time had more cases than Canada did and the trend in rise and fall of cases are similar for the two countries over time
- According to the line chart, the prediction would be decreasing number of new cases over the next three months



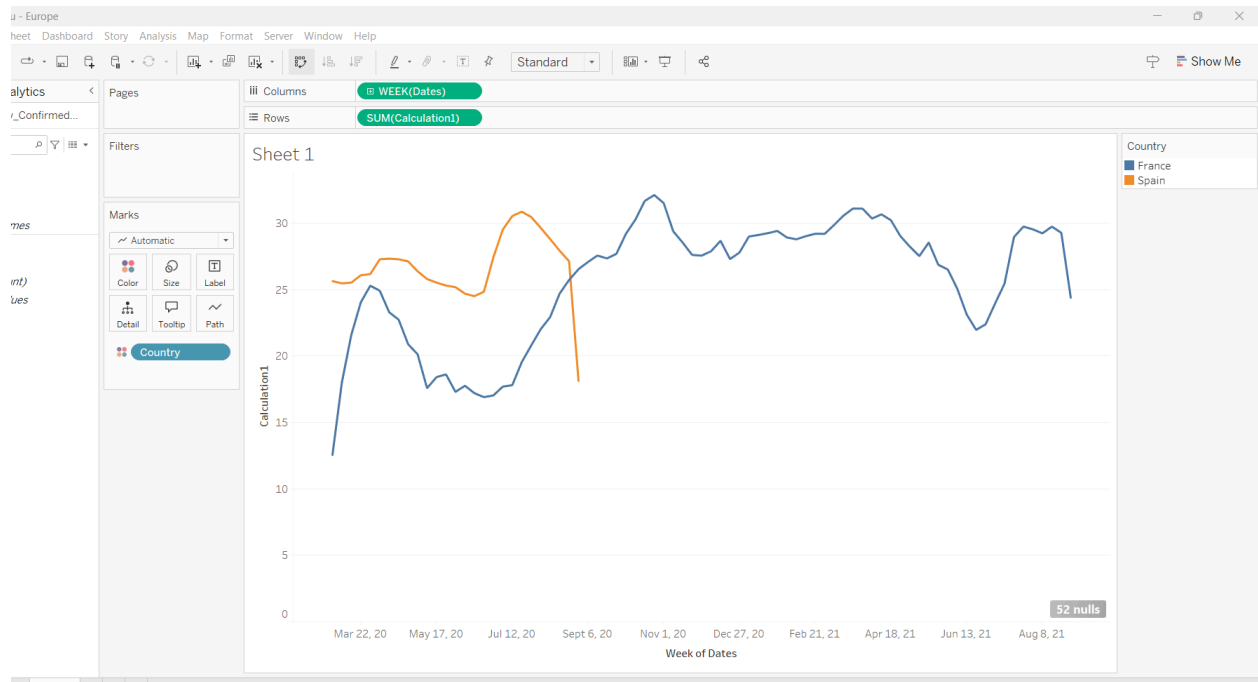
South America

- A. First Wave: April 12, 2020 to Oct 18, 2020 - increasing trend
 Second wave : Oct 18, 2020 to May 30, 2021 - fluctuating trend
 Third wave: May 30 2021 to August 29, 2021 - declining trend
- B. The two countries have similar pattern with Brazil almost always having higher number of cases than Argentina
- C. According to the pattern, I would predict the cases to drop for both countries overall for the next three months overtime



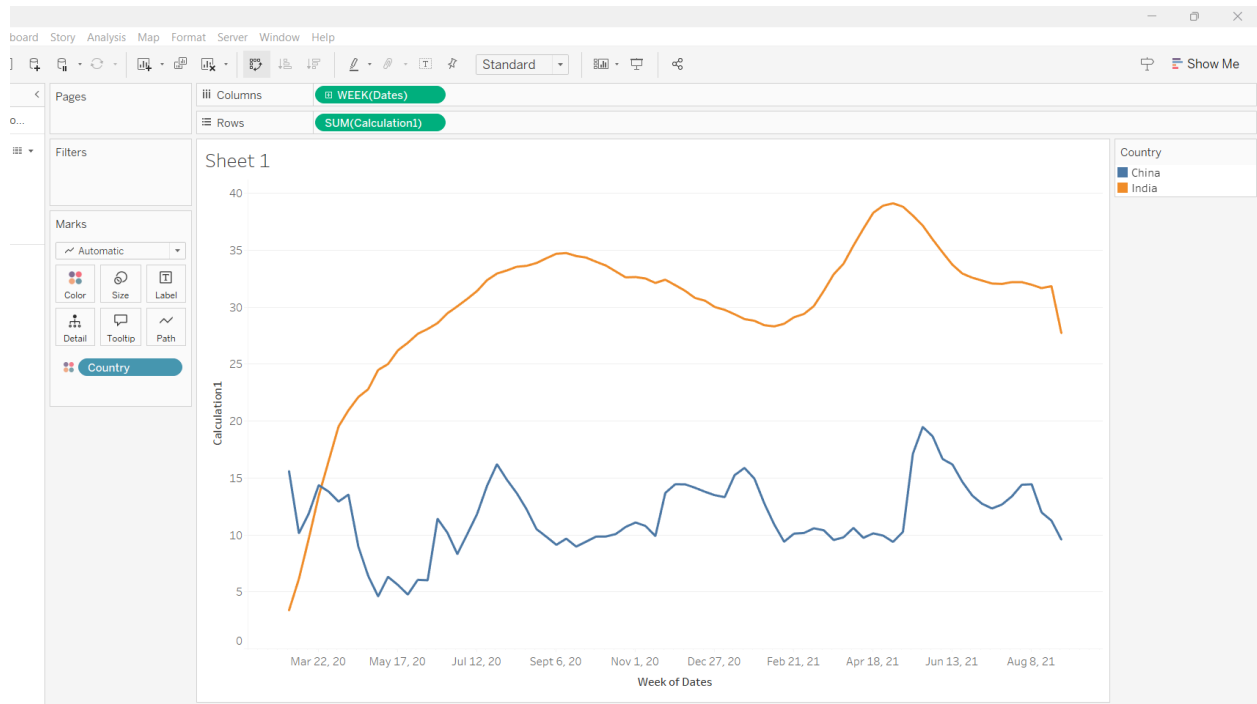
South Africa

- A. First wave: there was a sharp increase between March to July 2020
 Second wave: Between August and December 2020, there was a fall and then a steady rise
 Third wave: Between July and August 2021, there were fluctuations with a overall drop in the cases
- B. Both countries have similar pattern over the period, with minor differences during some weeks
- C. According to the pattern, the trend for next three months is unpredictable, it might continue declining and then fluctuate



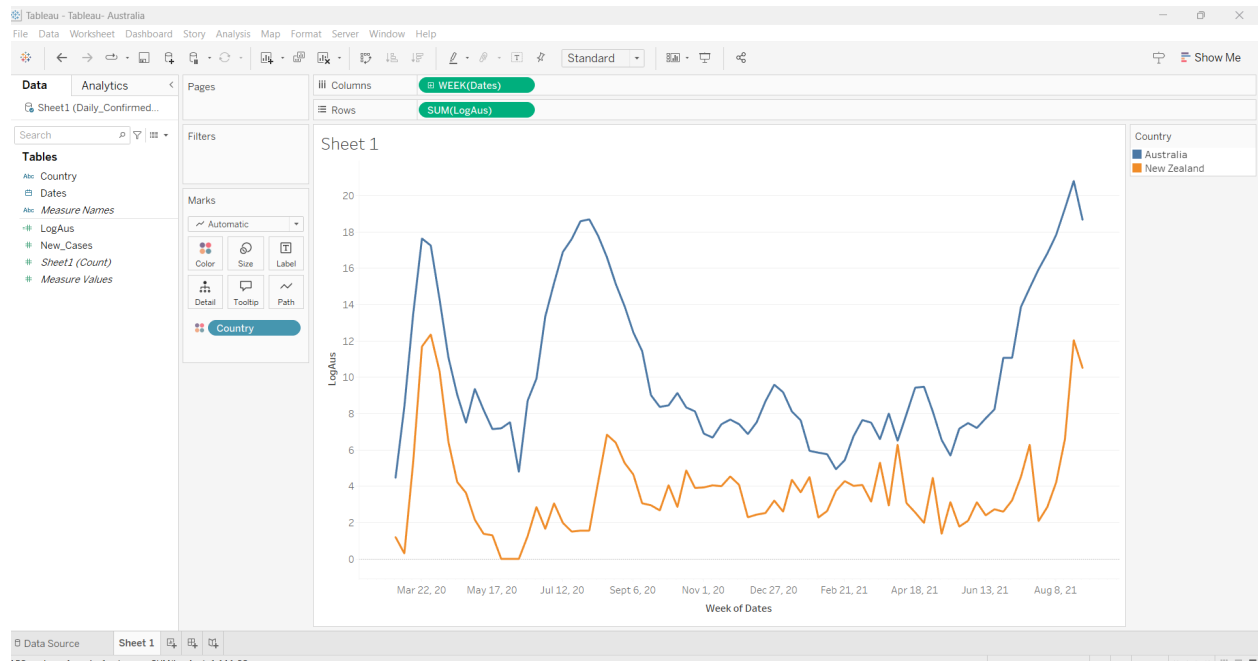
Europe

- A. For Spain, there was a rapid drop in July and August 2020
 For France, there was a sharp rise in March 2020, following a drop between March and June 2020 and then a increasing trend until October 2020, then it fluctuates and drops again in May and June 2021, then increases until July and again drops sharply
- B. Two countries have different patterns
- C. According to the pattern, the trend might be declining or fluctuating over the next three months



Asia

- A. For India, there was a steady increase from March to September 2020 and then decrease from September to February 2021, following a rise until May 2021 and then a drop
For China, the overall trend is fluctuating, with a sharp drop in April 2020 and August 2020, and a sharp rise in May 2021
- B. The overall trend for each country is different, India more cases than China March 22nd onwards and the pattern is much more stable compared to a very fluctuating trend for China, however, both countries experience drop May 2021 onwards
- C. According to the pattern, the trend is predicted to be decreasing over the next three months for both countries



Australia

- Both countries have a sharp rise in March 2020 and then a drop until June 2020, Australia had a sharp increase from June to August 2020, both countries had fluctuating trends in the following months with a sharp increase during months of July to August 2021
- The pattern for both countries are very similar over the period of time
- As per the, data, the trend might be fluctuating over the next three months for both countries, it is pretty unpredictable