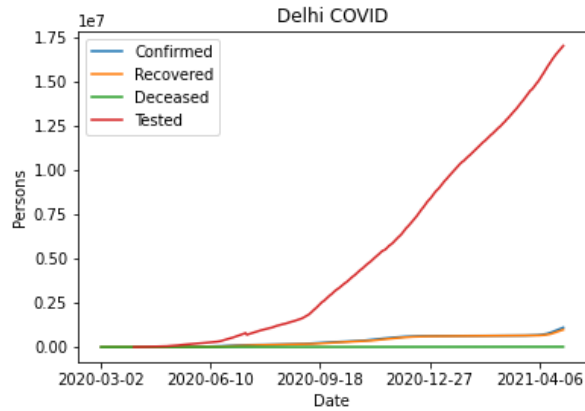
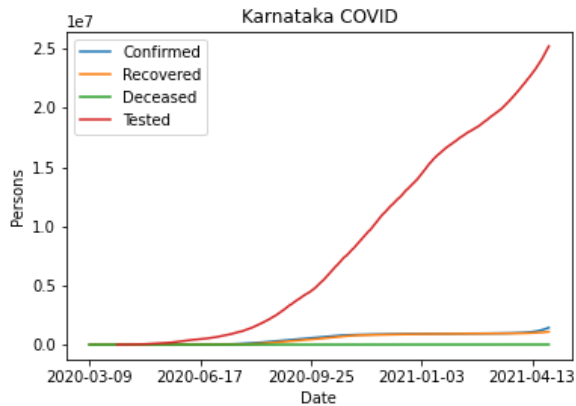


Question 1

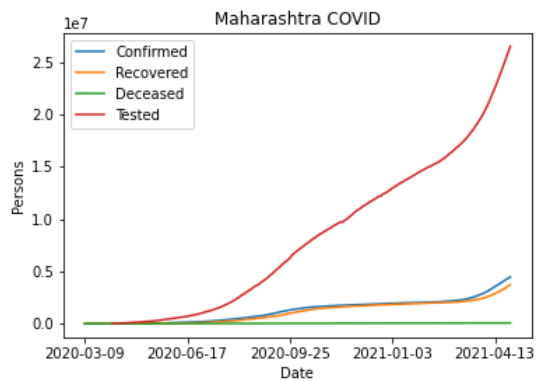
Delhi plot:



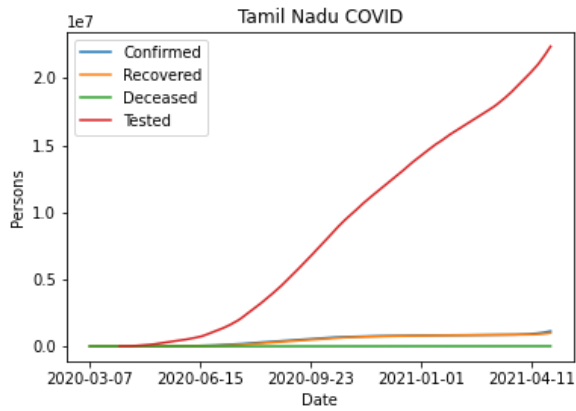
Bengaluru plot:



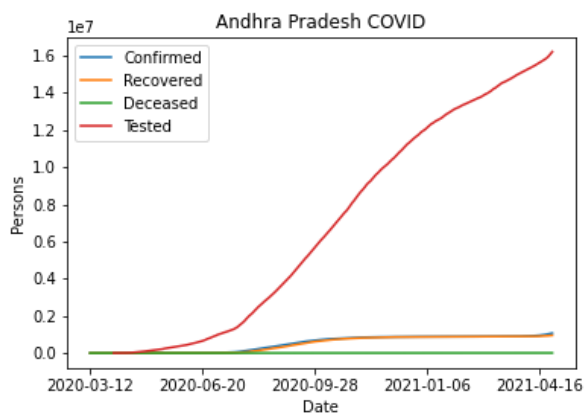
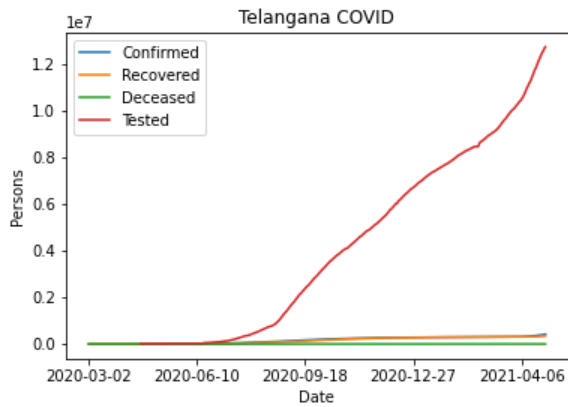
Mumbai plot:



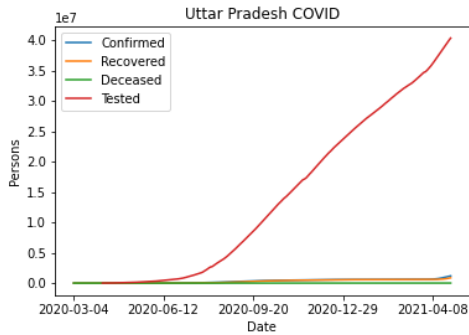
Chennai plot:



Hyderabad plots (Telangana and Andhra Pradesh):



Lucknow plot:



For this exam, I defined a safety metric as follows:

$$x_safety = (x.Confirmed.sum()/x.Recovered.sum()) - (x.Confirmed.sum()/x.Deceased.sum())$$

The results I got are below:

- **delhi_safety** = -55.67494
- **karna_safety** = -73.94581
- **mahar_safety** = -40.31725
- **tamil_safety** = -66.08460
- **hyder_safety** = -131.00329
- **uttar_safety** = -69.17004

I judged the most safe to least safe as the value closest to zero, leading me to come to the following rankings:

1. **Mumbai**
2. **Delhi**
3. **Chennai**
4. **Lucknow**
5. **Bengaluru**
6. **Hyderabad**

Delhi wordcloud:

[illegible]

[illegible]

Sentiment scores are below:

- **Delhi:** polarity=0.010576923076923074, subjectivity=0.4657051282051281
- **Bengaluru:** polarity=0.15324074074074073, subjectivity=0.4810185185185185
- **Mumbai:** polarity=-0.07456597222222222, subjectivity=0.39756944444444436
- **Chennai:** polarity=0.13997326203208557, subjectivity=0.4526292335115864
- **Hyderabad:** polarity=0.07547717434081071, subjectivity=0.32311419640965094
- **Lucknow:** polarity=0.1405844155844156, subjectivity=0.34718614718614715

From here, I calculated a new safety metric as follows...

$$x_sentiment_safety = x_safety + (x.sentiment_subjectivity/x.sentiment_polarity)$$

...and received the following results.

- **delhi_sentiment_safety** = -11.64464
- **karna_sentiment_safety** = -70.80684
- **mahar_sentiment_safety** = -45.64903
- **tamil_sentiment_safety** = -62.85091
- **hyder_sentiment_safety** = -126.72233
- **uttar_sentiment_safety** = -66.70045

With these values, I re-ranked each city based once again on their safety metric's proximity to 0.

1. **Delhi**
2. Mumbai
3. Chennai
4. Lucknow
5. Bengaluru
6. Hyderabad

Question 3

- a) With the results I've acquired, I feel that the three cities I would choose to visit would be Delhi, Mumbai, and Hyderabad. My reasoning for choosing the first two cities is simple, seeing as they are "safer" than the rest of the tested cities and would offer me a fine place to start researching for my newspaper article. Additionally, seeing as the two cities flipped between measures of my safety metric, I would also want to consider why this might be the case. As for Hyderabad, I would want to visit the city to see if conditions in the area are truly as bad as my metrics and measurements made it seem. This is moreso to confirm or deny suspicions that the city is unsafe for tourists, seeing as its safety metric was vastly lower than the other tested cities.
- b) One potential miscalculation that I've made in this selection is if these cities are as safe or as dangerous as my calculations make them seem. After all, it might be the case that Hyderabad is actually very sanitary and well-vaccinated, making it a very safe place to live, while Mumbai is plagued by untreated COVID patients all across the city. This is most likely due to how I chose to measure safety, as there are plenty of other methods that may lead to different ranks and results entirely. Any disparity between calculations and real life would invalidate my results, which is a big flaw that can only be pointed out by on-the-ground research.