METHODOLOGY

1,2) We fetched the json data from the file or from the online link using http call in python. then we just iterated over the json object and extracted the data required and stored them in arrays in required format for us to do the required computations. In question 2 after getting the outputs we converted them from simple arrays to pandas dataframe objects so that we can plot the area trend graphs.
3) For this question, we found the intercept and slopes without using any libraries except numpy. We used Normal equation for in order to find the coefficients of the line. The values of theta can be calculated by using following equation where x is matrix of x and y is matrix of y.

coeff = ((X.Transpose * X)^-1) * ((X.Transpose) * Y)

ASSUMPTIONS TAKEN

1) For question 1 and part 6, we assumed that word "spike" means count of cases on a particular day.
2) We have also included the Unidentified states('un') in our results.
3) We have excluded 'tt' values from the data.

RESULTS OF QUESTION 1 AND QUESTION 3

ANSWER TO Q1_1
Confirmed_count: 4110214
Recovered_count: 3177666
Deceased_count: 70095

ANSWER TO Q1_2
confirmed_count: 188193
Recovered_count: 163785
Deceased_count: 4538

ANSWER TO Q1_3
Confirmed_count: 1072055
Recovered_count: 800359
Deceased_count: 30813

ANSWER TO Q1_4
Confirmed -
Highest affected State is: mh
Highest affected State count is: 883862
Recovered -
Highest affected State is: mh
Highest affected State count is: 636574
Deceased -
Highest affected State is: mh
Highest affected State count is: 26275

ANSWER TO Q1_5
Confirmed -
Lowest affected State is: dd
Lowest affected State count is: 0
Recovered -
Lowest affected State is: dd
Lowest affected State count is: 0
Deceased -
Lowest affected State is: dd
Lowest affected State count is: 0

ANSWER TO Q1_6
Confirmed -
Day: 23-Jun-20
Count: 3947
Recovered -
Day: 20-Jun-20
Count: 7725
Deceased -
Day: 16-Jun-20
Count: 437

ANSWER TO Q1_7
Number of Active cases in an are : 343

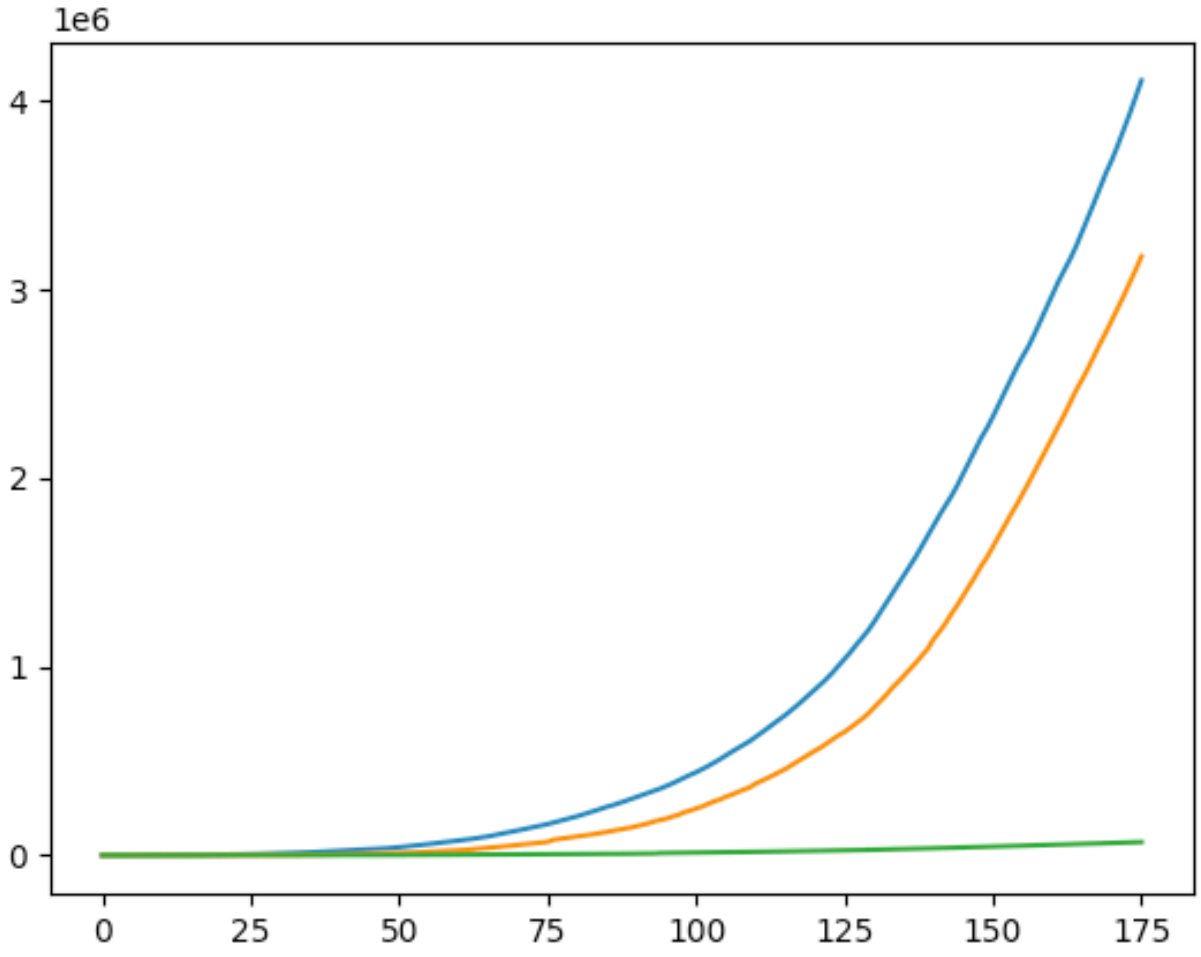
Number of Active cases in ap are : 100880
Number of Active cases in ar are : 1525
Number of Active cases in as are : 28404
Number of Active cases in br are : 16735
Number of Active cases in ch are : 2143
Number of Active cases in ct are : 22320
Number of Active cases in dd are : 0
Number of Active cases in dn are : 301
Number of Active cases in dl are : 19870
Number of Active cases in ga are : 4945
Number of Active cases in gj are : 16266
Number of Active cases in hp are : 2023
Number of Active cases in hr are : 14912
Number of Active cases in jh are : 14980
Number of Active cases in jk are : 9547
Number of Active cases in ka are : 100224
Number of Active cases in kl are : 21867
Number of Active cases in la are : 834
Number of Active cases in ld are : 0
Number of Active cases in mh are : 221013
Number of Active cases in ml are : 1374
Number of Active cases in mn are : 1872
Number of Active cases in mp are : 15687
Number of Active cases in mz are : 349
Number of Active cases in nl are : 701
Number of Active cases in or are : 25856
Number of Active cases in pb are : 15870
Number of Active cases in py are : 5163
Number of Active cases in rj are : 14996
Number of Active cases in sk are : 561
Number of Active cases in tg are : 32405
Number of Active cases in tn are : 51580
Number of Active cases in tr are : 5905
Number of Active cases in tt are : 0
Number of Active cases in un are : 0
Number of Active cases in up are : 59963

Number of Active cases in ut are : 7649
Number of Active cases in wb are : 23390

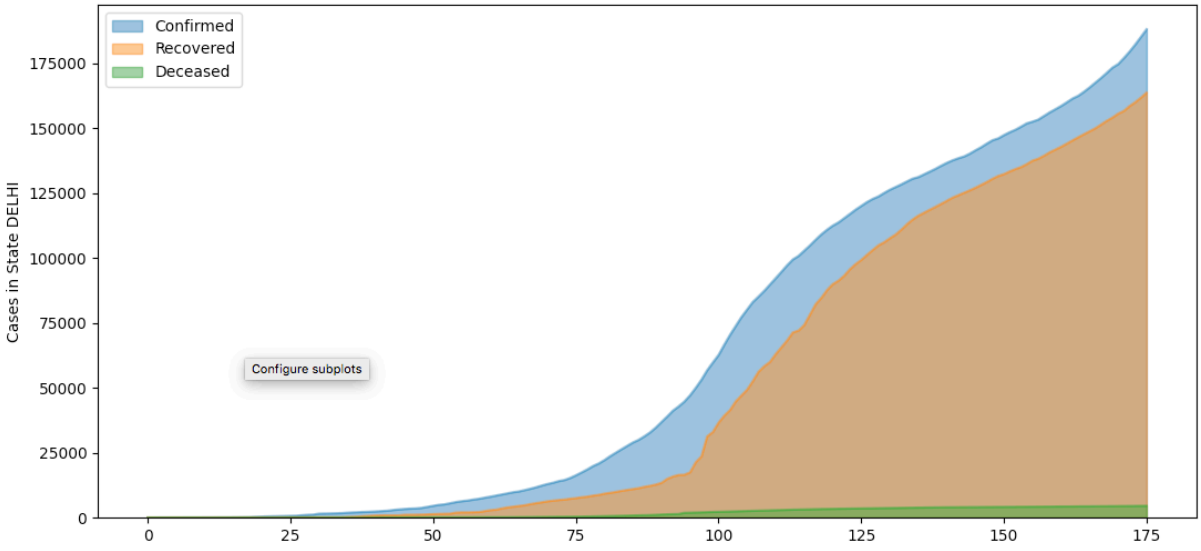
ANSWER TO Q3
Confirmed :
Intercept = -191.68619109947608
Slope = 15.40430214935243
Recovered :
Intercept = -243.82149869109912
Slope = 13.913469619729947
Deceased :
Intercept = 11.458278795811529
Slope = 0.15191340589694113

IMAGES OF QUESTION 2 ——————————————————

Plot for question 2 part 1



Plot For question 2 part 2 -



Plot For question 2 part 3 -