```
import pandas as pd
```

```
data = pd.read_csv('covid_19_india.csv')
```

```
data
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 2020-01-30 | 6:00 PM | Kerala | 1 | 0 | 0 | 0 | 1 |
| **1** | 2 | 2020-01-31 | 6:00 PM | Kerala | 1 | 0 | 0 | 0 | 1 |
| **2** | 3 | 2020-02-01 | 6:00 PM | Kerala | 2 | 0 | 0 | 0 | 2 |
| **3** | 4 | 2020-02-02 | 6:00 PM | Kerala | 3 | 0 | 0 | 0 | 3 |
| **4** | 5 | 2020-02-03 | 6:00 PM | Kerala | 3 | 0 | 0 | 0 | 3 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **18105** | 18106 | 2021-08-11 | 8:00 AM | Telangana | - | - | 638410 | 3831 | 650353 |
| **18106** | 18107 | 2021-08-11 | 8:00 AM | Tripura | - | - | 77811 | 773 | 80660 |
| **18107** | 18108 | 2021-08-11 | 8:00 AM | Uttarakhand | - | - | 334650 | 7368 | 342462 |
| **18108** | 18109 | 2021-08-11 | 8:00 AM | Uttar Pradesh | - | - | 1685492 | 22775 | 1708812 |
| **18109** | 18110 | 2021-08-11 | 8:00 AM | West Bengal | - | - | 1506532 | 18252 | 1534999 |

18110 rows × 9 columns

```
data.shape
```

```
(18110, 9)
```

```
data.isnull()
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **0** | False | False | False | False | False | False | False | False | False |
| **1** | False | False | False | False | False | False | False | False | False |
| **2** | False | False | False | False | False | False | False | False | False |
| **3** | False | False | False | False | False | False | False | False | False |
| **4** | False | False | False | False | False | False | False | False | False |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **18105** | False | False | False | False | False | False | False | False | False |
| **18106** | False | False | False | False | False | False | False | False | False |
| **18107** | False | False | False | False | False | False | False | False | False |
| **18108** | False | False | False | False | False | False | False | False | False |
| **18109** | False | False | False | False | False | False | False | False | False |

18110 rows × 9 columns

```
data.isnull().sum()
```

```
Sno                         0
Date                        0
Time                        0
State/UnionTerritory        0
ConfirmedIndianNational     0
ConfirmedForeignNational    0
Cured                       0
Deaths                      0
Confirmed                   0
dtype: int64
```

```
data.notnull()
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **0** | True | True | True | True | True | True | True | True | True |
| **1** | True | True | True | True | True | True | True | True | True |
| **2** | True | True | True | True | True | True | True | True | True |
| **3** | True | True | True | True | True | True | True | True | True |
| **4** | True | True | True | True | True | True | True | True | True |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **18105** | True | True | True | True | True | True | True | True | True |
| **18106** | True | True | True | True | True | True | True | True | True |
| **18107** | True | True | True | True | True | True | True | True | True |
| **18108** | True | True | True | True | True | True | True | True | True |
| **18109** | True | True | True | True | True | True | True | True | True |

18110 rows × 9 columns

```
data.notnull().sum()
```

```
Sno                        18110
Date                       18110
Time                       18110
State/UnionTerritory       18110
ConfirmedIndianNational    18110
ConfirmedForeignNational   18110
Cured                      18110
Deaths                     18110
Confirmed                  18110
dtype: int64
```

```
data.columns
```

```
Index(['Sno', 'Date', 'Time', 'State/UnionTerritory',
       'ConfirmedIndianNational', 'ConfirmedForeignNational', 'Cured',
       'Deaths', 'Confirmed'],
      dtype='object')
```

```
data.value_counts().sum()
```

```
18110
```

```
data.count()
```

```
Sno                        18110
Date                       18110
Time                       18110
State/UnionTerritory       18110
ConfirmedIndianNational    18110
ConfirmedForeignNational   18110
Cured                      18110
```

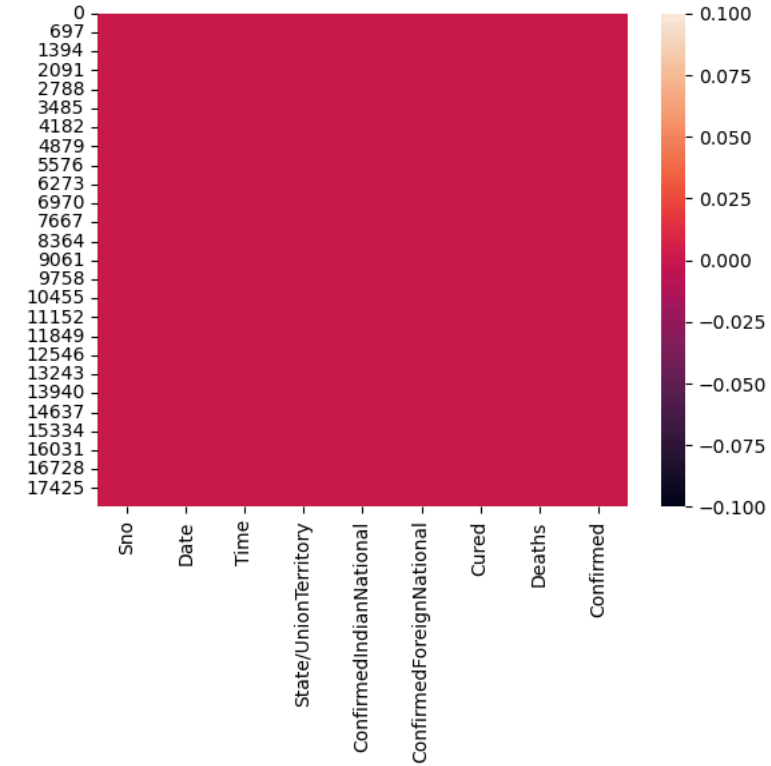
```
Deaths                    18110
Confirmed                 18110
dtype: int64
```

```
import seaborn as sns
```

```
import matplotlib.pyplot as plt
```

```
sns.heatmap(data.isnull())
plt.show
```

```
<function matplotlib.pyplot.show(close=None, block=None)>
```




```
data[data['State/UnionTerritory'] == 'Tamil Nadu']
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **61** | 62 | 2020-03-07 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **67** | 68 | 2020-03-08 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **79** | 80 | 2020-03-09 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **94** | 95 | 2020-03-10 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **105** | 106 | 2020-03-11 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **17960** | 17961 | 2021-08-07 | 8:00 AM | Tamil Nadu | - | - | 2516938 | 34260 | 2571383 |
| **17996** | 17997 | 2021-08-08 | 8:00 AM | Tamil Nadu | - | - | 2518777 | 34289 | 2573352 |
| **18032** | 18033 | 2021-08-09 | 8:00 AM | Tamil Nadu | - | - | 2520584 | 34317 | 2575308 |
| **18068** | 18069 | 2021-08-10 | 8:00 AM | Tamil Nadu | - | - | 2522470 | 34340 | 2577237 |
| **18104** | 18105 | 2021-08-11 | 8:00 AM | Tamil Nadu | - | - | 2524400 | 34367 | 2579130 |

523 rows × 9 columns

## Show the Number of Deaths,Cured,Confirmed case of each State/UnionTerritory.

```
df = data.groupby('State/UnionTerritory')
```

```
df
```

```
<pandas.core.groupby.generic.DataFrameGroupBy object at 0x00000238B900CB10>
```

```
df = data.groupby('State/UnionTerritory')['Cured','Deaths','Confirmed'].sum()
```

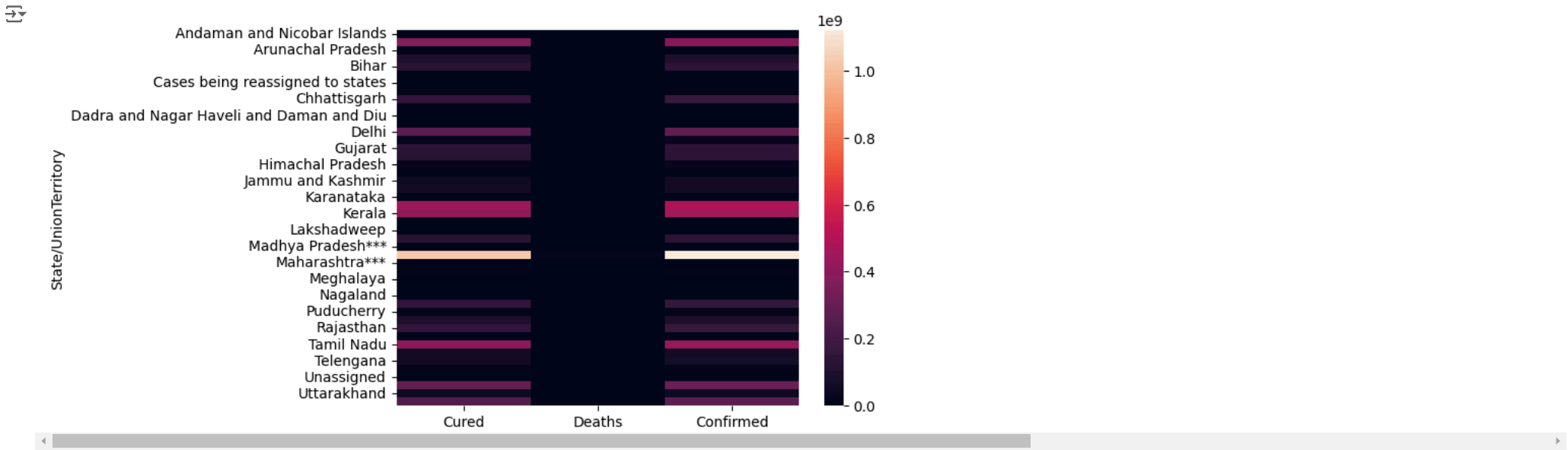
```
C:\Users\SANTHOSHRAJ E\AppData\Local\Temp\ipykernel_21596\3716590523.py:1: FutureWarning: Indexing with multiple keys (implicitly converted to a tuple of keys) will be deprecated, use a list inste
  df = data.groupby('State/UnionTerritory')['Cured','Deaths','Confirmed'].sum()
```

```
df
```

| State/UnionTerritory | Cured | Deaths | Confirmed |
|---|---|---|---|
| **Andaman and Nicobar Islands** | 1848286 | 27136 | 1938498 |
| **Andhra Pradesh** | 370426530 | 2939367 | 392432753 |
| **Arunachal Pradesh** | 6588149 | 26799 | 7176907 |
| **Assam** | 92678680 | 638323 | 99837011 |
| **Bihar** | 125122902 | 1093466 | 132231166 |
| **Bihar**** | 1402468 | 18881 | 1430909 |
| **Cases being reassigned to states** | 0 | 0 | 345565 |
| **Chandigarh** | 10117035 | 147694 | 10858627 |
| **Chhattisgarh** | 151609364 | 2063920 | 163776262 |
| **Dadra and Nagar Haveli** | 20352 | 8 | 20722 |
| **Dadra and Nagar Haveli and Daman and Diu** | 1841750 | 1014 | 1938632 |
| **Daman & Diu** | 0 | 0 | 2 |
| **Delhi** | 273419887 | 4943294 | 287227765 |
| **Goa** | 26027201 | 447801 | 28240159 |
| **Gujarat** | 132487127 | 2219448 | 143420082 |
| **Haryana** | 126585342 | 1502799 | 134347285 |
| **Himachal Pradesh** | 27501110 | 491348 | 30033289 |
| **Himanchal Pradesh** | 200040 | 3507 | 204516 |
| **Jammu and Kashmir** | 53297341 | 839694 | 58117726 |
| **Jharkhand** | 58034506 | 748641 | 62111994 |
| **Karanataka** | 2821491 | 36197 | 2885238 |
| **Karnataka** | 441844360 | 6053762 | 485970693 |
| **Kerala** | 420174235 | 1888177 | 458906023 |
| **Ladakh** | 3758960 | 45804 | 4054293 |
| **Lakshadweep** | 820925 | 3908 | 915784 |
| **Madhya Pradesh** | 126724997 | 1777752 | 135625265 |
| **Madhya Pradesh*** | 780735 | 10506 | 791656 |
| **Maharashtra** | 1018765039 | 23737432 | 1121491467 |
| **Maharashtra*** | 6000911 | 130753 | 6229596 |
| **Manipur** | 11230568 | 173056 | 12617943 |
| **Meghalaya** | 6537909 | 101950 | 7355969 |
| **Mizoram** | 2384602 | 9791 | 2984732 |

| | | | |
|---|---|---|---|
| **Nagaland** | 4519526 | 58460 | 5041742 |
| **Odisha** | 150923455 | 790814 | 160130533 |
| **Puducherry** | 18483117 | 312155 | 20065891 |
| **Punjab** | 91458159 | 2785594 | 99949702 |
| **Rajasthan** | 150356820 | 1473089 | 162369656 |
| **Sikkim** | 2747214 | 53150 | 3186799 |
| **Tamil Nadu** | 404095807 | 5916658 | 431928644 |
| **Telangana** | 57488245 | 349648 | 60571979 |
| **Telengana** | 64666267 | 400427 | 69990668 |
| **Tripura** | 12976846 | 150342 | 14050250 |
| **Unassigned** | 0 | 0 | 161 |
| **Uttar Pradesh** | 291479351 | 4143450 | 312625843 |
| **Uttarakhand** | 48362741 | 986001 | 53140414 |
| **West Bengal** | 247515102 | 3846989 | 263107876 |

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.heatmap(df)
plt.show()
```



## Removed All The Records Where Confirmed Case is less than 20

```
d = data[~ (data.Confirmed > 20)]
```

```
d
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 2020-01-30 | 6:00 PM | Kerala | 1 | 0 | 0 | 0 | 1 |
| **1** | 2 | 2020-01-31 | 6:00 PM | Kerala | 1 | 0 | 0 | 0 | 1 |
| **2** | 3 | 2020-02-01 | 6:00 PM | Kerala | 2 | 0 | 0 | 0 | 2 |
| **3** | 4 | 2020-02-02 | 6:00 PM | Kerala | 3 | 0 | 0 | 0 | 3 |
| **4** | 5 | 2020-02-03 | 6:00 PM | Kerala | 3 | 0 | 0 | 0 | 3 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **10603** | 10604 | 2021-01-15 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **10639** | 10640 | 2021-01-16 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **10675** | 10676 | 2021-01-17 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **10711** | 10712 | 2021-01-18 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **10747** | 10748 | 2021-01-19 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 14 |

956 rows × 9 columns

## In Which State , Maximum Number of Confirmed Case were Record?

```
d = data.groupby('State/UnionTerritory')
```

```
d = data.groupby('State/UnionTerritory')['Confirmed'].sum()
```

```
d
```

```
State/UnionTerritory
Andaman and Nicobar Islands                   1938498
Andhra Pradesh                              392432753
Arunachal Pradesh                             7176907
Assam                                        99837011
Bihar                                       132231166
Bihar****                                     1430909
Cases being reassigned to states               345565
Chandigarh                                   10858627
Chhattisgarh                                163776262
Dadra and Nagar Haveli                         20722
Dadra and Nagar Haveli and Daman and Diu       1938632
Daman & Diu                                          2
```

```
Delhi                                287227765
Goa                                   28240159
Gujarat                              143420082
Haryana                              134347285
Himachal Pradesh                      30033289
Himanchal Pradesh                       204516
Jammu and Kashmir                     58117726
Jharkhand                             62111994
Karanataka                             2885238
Karnataka                            485970693
Kerala                               458906023
Ladakh                                 4054293
Lakshadweep                             915784
Madhya Pradesh                       135625265
Madhya Pradesh***                       791656
Maharashtra                         1121491467
Maharashtra***                         6229596
Manipur                               12617943
Meghalaya                              7355969
Mizoram                                2984732
Nagaland                               5041742
Odisha                               160130533
Puducherry                            20065891
Punjab                                99949702
Rajasthan                            162369656
Sikkim                                 3186799
Tamil Nadu                           431928644
Telangana                             60571979
Telengana                             69990668
Tripura                               14050250
Unassigned                                161
Uttar Pradesh                        312625843
Uttarakhand                           53140414
West Bengal                          263107876
Name: Confirmed, dtype: int64
```

```
d = data.groupby('State/UnionTerritory')['Confirmed'].sum().sort_values(ascending = False)
```

```
d
```

```
State/UnionTerritory
Maharashtra                         1121491467
Karnataka                            485970693
Kerala                               458906023
Tamil Nadu                           431928644
Andhra Pradesh                       392432753
Uttar Pradesh                        312625843
Delhi                                287227765
West Bengal                          263107876
Chhattisgarh                         163776262
Rajasthan                            162369656
Odisha                               160130533
Gujarat                              143420082
Madhya Pradesh                       135625265
Haryana                              134347285
Bihar                                132231166
Punjab                                99949702
Assam                                 99837011
Telengana                             69990668
Jharkhand                             62111994
```

```
Telangana                                   60571979
Jammu and Kashmir                           58117726
Uttarakhand                                 53140414
Himachal Pradesh                            30033289
Goa                                         28240159
Puducherry                                  20065891
Tripura                                     14050250
Manipur                                     12617943
Chandigarh                                  10858627
Meghalaya                                    7355969
Arunachal Pradesh                            7176907
Maharashtra***                               6229596
Nagaland                                     5041742
Ladakh                                       4054293
Sikkim                                       3186799
Mizoram                                      2984732
Karanataka                                   2885238
Dadra and Nagar Haveli and Daman and Diu     1938632
Andaman and Nicobar Islands                  1938498
Bihar****                                    1430909
Lakshadweep                                   915784
Madhya Pradesh***                             791656
Cases being reassigned to states              345565
Himanchal Pradesh                             204516
Dadra and Nagar Haveli                         20722
Unassigned                                       161
Daman & Diu                                        2
Name: Confirmed, dtype: int64
```

```
d.head(20)
```

```
State/UnionTerritory
Maharashtra       1121491467
Karnataka          485970693
Kerala             458906023
Tamil Nadu         431928644
Andhra Pradesh     392432753
Uttar Pradesh      312625843
Delhi              287227765
West Bengal        263107876
Chhattisgarh       163776262
Rajasthan          162369656
Odisha             160130533
Gujarat            143420082
Madhya Pradesh     135625265
Haryana            134347285
Bihar              132231166
Punjab              99949702
Assam               99837011
Telengana           69990668
Jharkhand           62111994
Telangana           60571979
Name: Confirmed, dtype: int64
```

## In Which State, Minimum Number of Deaths Case is less than 20

```
d = data.groupby('State/UnionTerritory')['Deaths'].sum().sort_values(ascending = True)
```

```
d
```

```
State/UnionTerritory
Unassigned                                    0
Cases being reassigned to states              0
Daman & Diu                                   0
Dadra and Nagar Haveli                        8
Dadra and Nagar Haveli and Daman and Diu     1014
Himanchal Pradesh                            3507
Lakshadweep                                  3908
Mizoram                                      9791
Madhya Pradesh***                           10506
Bihar****                                   18881
Arunachal Pradesh                           26799
Andaman and Nicobar Islands                 27136
Karanataka                                  36197
Ladakh                                      45804
Sikkim                                      53150
Nagaland                                    58460
Meghalaya                                  101950
Maharashtra***                             130753
Chandigarh                                 147694
Tripura                                    150342
Manipur                                    173056
Puducherry                                 312155
Telangana                                  349648
Telengana                                  400427
Goa                                        447801
Himachal Pradesh                           491348
Assam                                      638323
Jharkhand                                  748641
Odisha                                     790814
Jammu and Kashmir                          839694
Uttarakhand                                986001
Bihar                                     1093466
Rajasthan                                 1473089
Haryana                                   1502799
Madhya Pradesh                            1777752
Kerala                                    1888177
Chhattisgarh                              2063920
Gujarat                                   2219448
Punjab                                    2785594
Andhra Pradesh                            2939367
West Bengal                               3846989
Uttar Pradesh                             4143450
Delhi                                     4943294
Tamil Nadu                                5916658
Karnataka                                 6053762
Maharashtra                              23737432
Name: Deaths, dtype: int64
```

```
d.head(20)
```

```
State/UnionTerritory
Unassigned                                0
Cases being reassigned to states          0
Daman & Diu                               0
Dadra and Nagar Haveli                    8
```

```
Dadra and Nagar Haveli and Daman and Diu      1014
Himanchal Pradesh                             3507
Lakshadweep                                   3908
Mizoram                                       9791
Madhya Pradesh***                            10506
Bihar****                                    18881
Arunachal Pradesh                            26799
Andaman and Nicobar Islands                  27136
Karanataka                                   36197
Ladakh                                       45804
Sikkim                                       53150
Nagaland                                     58460
Meghalaya                                   101950
Maharashtra***                              130753
Chandigarh                                  147694
Tripura                                     150342
Name: Deaths, dtype: int64
```

## How many Confirmed,Cured and Deaths cases were reported from Tamilnadu till 2020-08-11?

```
data[data['State/UnionTerritory'] == 'Tamil Nadu']
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **61** | 62 | 2020-03-07 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **67** | 68 | 2020-03-08 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **79** | 80 | 2020-03-09 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **94** | 95 | 2020-03-10 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **105** | 106 | 2020-03-11 | 6:00 PM | Tamil Nadu | 1 | 0 | 0 | 0 | 1 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **17960** | 17961 | 2021-08-07 | 8:00 AM | Tamil Nadu | - | - | 2516938 | 34260 | 2571383 |
| **17996** | 17997 | 2021-08-08 | 8:00 AM | Tamil Nadu | - | - | 2518777 | 34289 | 2573352 |
| **18032** | 18033 | 2021-08-09 | 8:00 AM | Tamil Nadu | - | - | 2520584 | 34317 | 2575308 |
| **18068** | 18069 | 2021-08-10 | 8:00 AM | Tamil Nadu | - | - | 2522470 | 34340 | 2577237 |
| **18104** | 18105 | 2021-08-11 | 8:00 AM | Tamil Nadu | - | - | 2524400 | 34367 | 2579130 |

523 rows × 9 columns

## Sort the entire datawrt Number of Confirmed cases in ascending order

```
data.sort_values(by = ['Confirmed'], ascending = True)
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **9451** | 9452 | 2020-12-14 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **10531** | 10532 | 2021-01-13 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **1080** | 1081 | 2020-04-18 | 5:00 PM | Nagaland | - | - | 0 | 0 | 0 |
| **10027** | 10028 | 2020-12-30 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **9523** | 9524 | 2020-12-16 | 8:00 AM | Lakshadweep | - | - | 0 | 0 | 0 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **17950** | 17951 | 2021-08-07 | 8:00 AM | Maharashtra | - | - | 6130137 | 133717 | 6341759 |
| **17986** | 17987 | 2021-08-08 | 8:00 AM | Maharashtra | - | - | 6139493 | 133845 | 6347820 |
| **18022** | 18023 | 2021-08-09 | 8:00 AM | Maharashtra | - | - | 6144388 | 133996 | 6353328 |
| **18058** | 18059 | 2021-08-10 | 8:00 AM | Maharashtra | - | - | 6151956 | 134064 | 6357833 |
| **18094** | 18095 | 2021-08-11 | 8:00 AM | Maharashtra | - | - | 6159676 | 134201 | 6363442 |

18110 rows × 9 columns

## Sort the entire datawrite Number of Deaths in ascending order

```
data.sort_values(by = ['Deaths'],ascending = True)
```

| | Sno | Date | Time | State/UnionTerritory | ConfirmedIndianNational | ConfirmedForeignNational | Cured | Deaths | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 2020-01-30 | 6:00 PM | Kerala | 1 | 0 | 0 | 0 | 1 |
| **1250** | 1251 | 2020-04-23 | 5:00 PM | Tripura | - | - | 1 | 0 | 2 |
| **4130** | 4131 | 2020-07-15 | 8:00 AM | Nagaland | - | - | 346 | 0 | 896 |
| **2614** | 2615 | 2020-06-03 | 8:00 AM | Manipur | - | - | 14 | 0 | 89 |
| **5533** | 5534 | 2020-08-24 | 8:00 AM | Mizoram | - | - | 459 | 0 | 918 |