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DIVISION: - ET1

BATCH :- E11

ROLL NO.: - ET1-03

PRN: - 202401070026

A real-life dataset :- COVID 19 Dataset

==> Below are the problem statements for the given dataset.

1) Display the first 10 rows of the dataset.

2) • Find the total number of rows and columns in the dataset.

3) • List all the column names.

4) • Check for any missing values in the dataset.

5) • Total number of confirmed cases across all states?

6) • Total number of deaths across all states?

7) • Which state has reported the highest number of confirmed cases?

8) • Which day saw the highest number of new cases?

9) • Number of states with more than 100,000 confirmed cases?

10) • Total number of recoveries across all states?

11) • Overall death rate (deaths/confirmed cases)?

12) • Top 5 states with the highest recovery rate?

13) • Which state had zero new cases on the most number of days?

14) • Average number of new cases per day across India?

15) • Find the day with the maximum number of recoveries?

16) • States that reported no deaths?

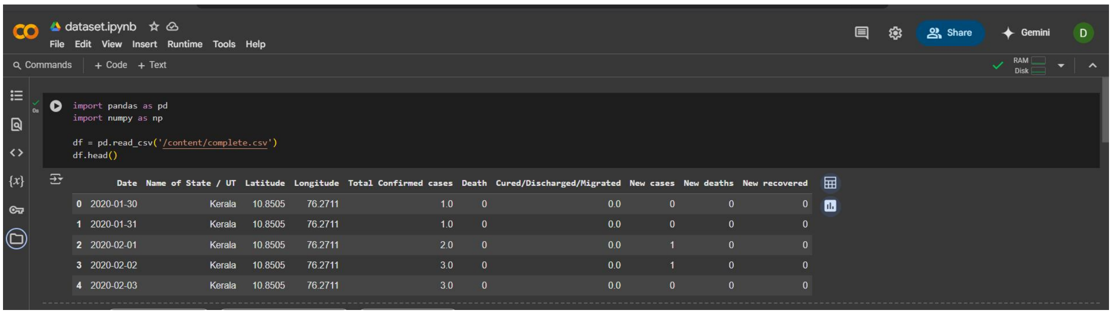
17) • Median of daily new cases across India?

18) • First date when a death was reported?

19) • Total number of days recorded for each state?

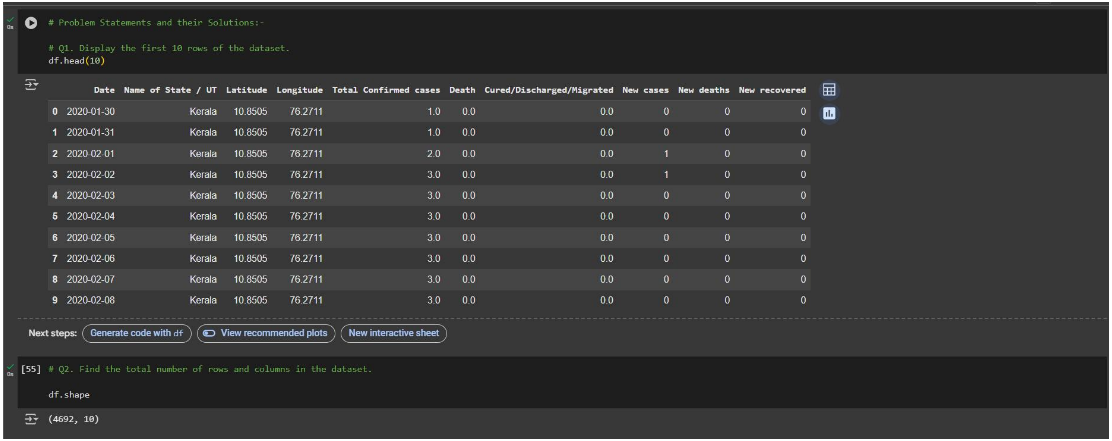
20) • State with the highest number of new deaths in a single day?

==> Below are the snapshots of the 20 problem statements on the given dataset with their respective solution.



```
import pandas as pd
import numpy as np

df = pd.read_csv('/content/complete.csv')
df.head()
```

	Date	Name of State / UT	Latitude	Longitude	Total Confirmed cases	Death	Cured/Discharged/Migrated	New cases	New deaths	New recovered
0	2020-01-30	Kerala	10.8505	76.2711	1.0	0	0.0	0	0	0
1	2020-01-31	Kerala	10.8505	76.2711	1.0	0	0.0	0	0	0
2	2020-02-01	Kerala	10.8505	76.2711	2.0	0	0.0	1	0	0
3	2020-02-02	Kerala	10.8505	76.2711	3.0	0	0.0	1	0	0
4	2020-02-03	Kerala	10.8505	76.2711	3.0	0	0.0	0	0	0

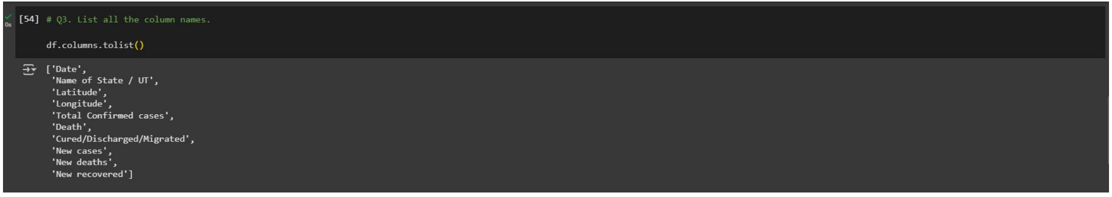


```
# Problem Statements and their Solutions:-

# Q1. Display the first 10 rows of the dataset.
df.head(10)
```

	Date	Name of State / UT	Latitude	Longitude	Total Confirmed cases	Death	Cured/Discharged/Migrated	New cases	New deaths	New recovered
0	2020-01-30	Kerala	10.8505	76.2711	1.0	0.0	0.0	0	0	0
1	2020-01-31	Kerala	10.8505	76.2711	1.0	0.0	0.0	0	0	0
2	2020-02-01	Kerala	10.8505	76.2711	2.0	0.0	0.0	1	0	0
3	2020-02-02	Kerala	10.8505	76.2711	3.0	0.0	0.0	1	0	0
4	2020-02-03	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0
5	2020-02-04	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0
6	2020-02-05	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0
7	2020-02-06	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0
8	2020-02-07	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0
9	2020-02-08	Kerala	10.8505	76.2711	3.0	0.0	0.0	0	0	0

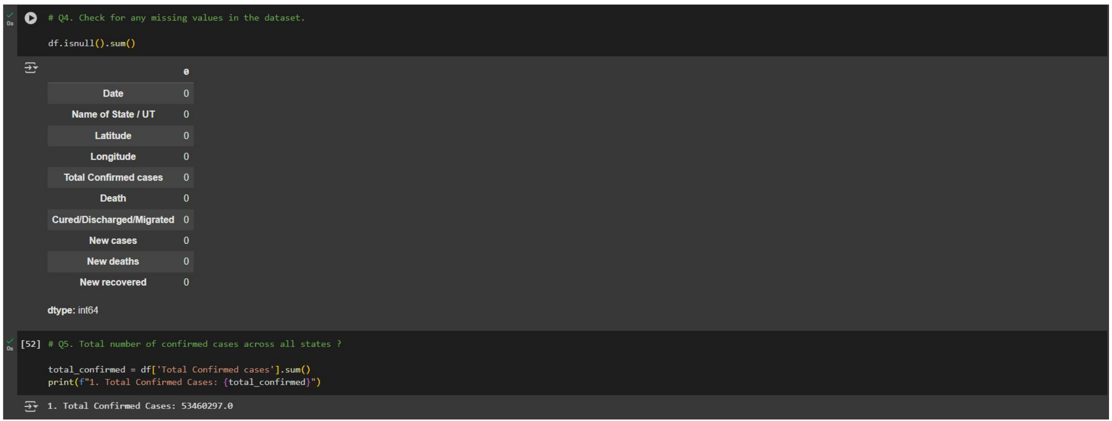
```
[55] # Q2. Find the total number of rows and columns in the dataset.

     df.shape
```

```
(4692, 10)
```



```
[54] # Q3. List all the column names.

     df.columns.tolist()
```

```
['Date',
 'Name of State / UT',
 'Latitude',
 'Longitude',
 'Total Confirmed cases',
 'Death',
 'Cured/Discharged/Migrated',
 'New cases',
 'New deaths',
 'New recovered']
```



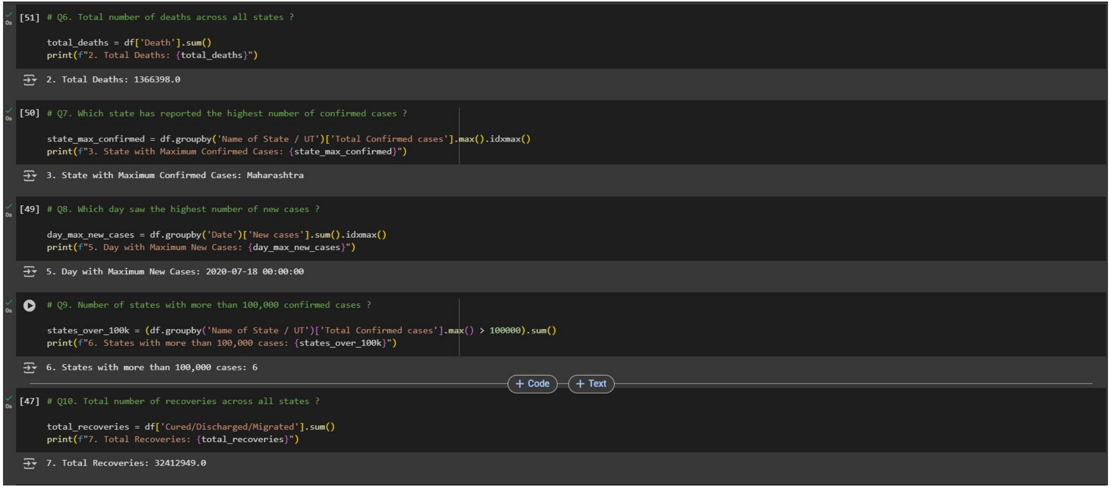
```
# Q4. Check for any missing values in the dataset.

df.isnull().sum()
```

	0
Date	0
Name of State / UT	0
Latitude	0
Longitude	0
Total Confirmed cases	0
Death	0
Cured/Discharged/Migrated	0
New cases	0
New deaths	0
New recovered	0

dtype: int64

```
[52] # Q5. Total number of confirmed cases across all states ?

     total_confirmed = df['Total Confirmed cases'].sum()
     print(f"1. Total Confirmed Cases: {total_confirmed}")
```

```
1. Total Confirmed Cases: 53460297.0
```



```
[51] # Q6. Total number of deaths across all states ?

     total_deaths = df['Death'].sum()
     print(f"2. Total Deaths: {total_deaths}")
```

```
2. Total Deaths: 1366398.0
```

```
[50] # Q7. Which state has reported the highest number of confirmed cases ?

     state_max_confirmed = df.groupby('Name of State / UT')['Total Confirmed cases'].max().idxmax()
     print(f"3. State with Maximum Confirmed Cases: {state_max_confirmed}")
```

```
3. State with Maximum Confirmed Cases: Maharashtra
```

```
[49] # Q8. Which day saw the highest number of new cases ?

     day_max_new_cases = df.groupby('Date')['New cases'].sum().idxmax()
     print(f"5. Day with Maximum New Cases: {day_max_new_cases}")
```

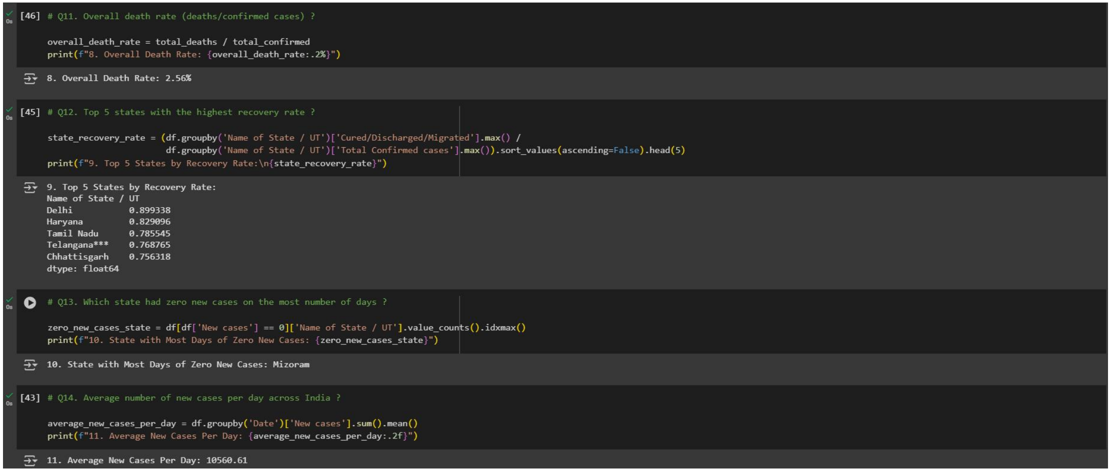
```
5. Day with Maximum New Cases: 2020-07-18 00:00:00
```

```
# Q9. Number of states with more than 100,000 confirmed cases ?

states_over_100k = (df.groupby('Name of State / UT')['Total Confirmed cases'].max() > 100000).sum()
print(f"6. States with more than 100,000 cases: {states_over_100k}")
```

```
6. States with more than 100,000 cases: 6
```

```
[47] # Q10. Total number of recoveries across all states ?

     total_recoveries = df['Cured/Discharged/Migrated'].sum()
     print(f"7. Total Recoveries: {total_recoveries}")
```

```
7. Total Recoveries: 32412949.0
```



```
[46] # Q11. Overall death rate (deaths/confirmed cases) ?

     overall_death_rate = total_deaths / total_confirmed
     print(f"8. Overall Death Rate: {overall_death_rate:.2%}")
```

```
8. Overall Death Rate: 2.56%
```

```
[45] # Q12. Top 5 states with the highest recovery rate ?

     state_recovery_rate = (df.groupby('Name of State / UT')['Cured/Discharged/Migrated'].max() /
                            df.groupby('Name of State / UT')['Total Confirmed cases'].max()).sort_values(ascending=False).head(5)
     print(f"9. Top 5 States by Recovery Rate:\n{state_recovery_rate}")
```

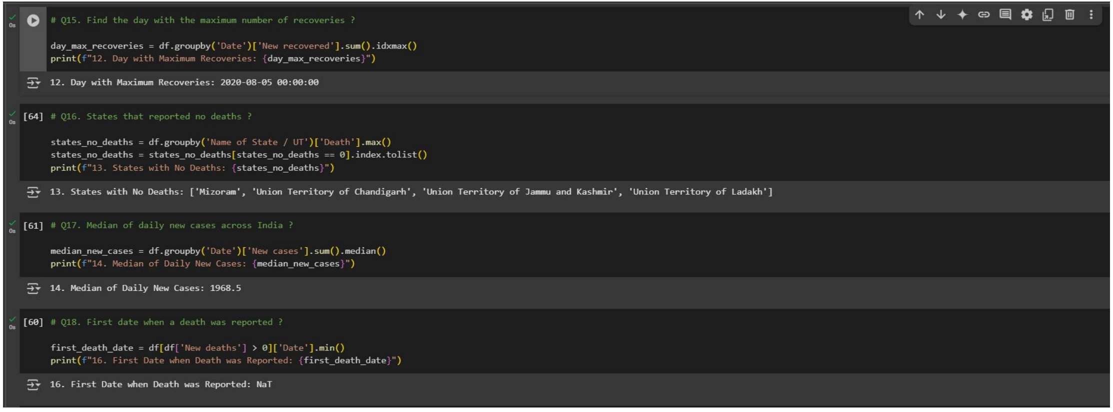
```
9. Top 5 States by Recovery Rate:
Name of State / UT
Delhi           0.899338
Haryana         0.829096
Tamil Nadu      0.785545
Telangana***    0.768765
Chhattisgarh    0.756318
dtype: float64
```

```
# Q13. Which state had zero new cases on the most number of days ?

zero_new_cases_state = df[df['New cases'] == 0]['Name of State / UT'].value_counts().idxmax()
print(f"10. State with Most Days of Zero New Cases: {zero_new_cases_state}")
```

```
10. State with Most Days of Zero New Cases: Mizoram
```

```
[43] # Q14. Average number of new cases per day across India ?

     average_new_cases_per_day = df.groupby('Date')['New cases'].sum().mean()
     print(f"11. Average New Cases Per Day: {average_new_cases_per_day:.2f}")
```

```
11. Average New Cases Per Day: 10560.61
```



```
# Q15. Find the day with the maximum number of recoveries ?

day_max_recoveries = df.groupby('Date')['New recovered'].sum().idxmax()
print(f"12. Day with Maximum Recoveries: {day_max_recoveries}")
```

```
12. Day with Maximum Recoveries: 2020-08-05 00:00:00
```

```
[64] # Q16. States that reported no deaths ?

     states_no_deaths = df.groupby('Name of State / UT')['Death'].max()
     states_no_deaths = states_no_deaths[states_no_deaths == 0].index.tolist()
     print(f"13. States with No Deaths: {states_no_deaths}")
```

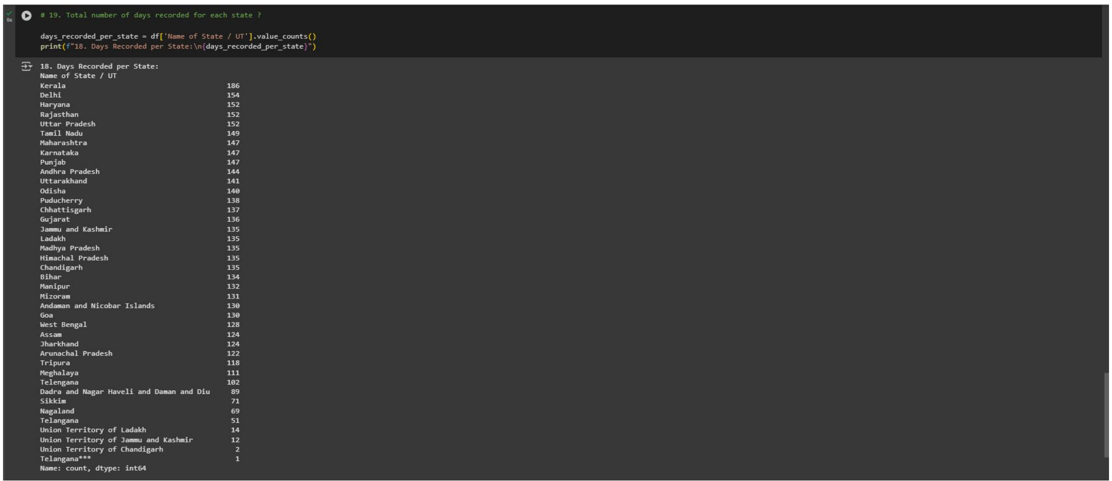
```
13. States with No Deaths: ['Mizoram', 'Union Territory of Chandigarh', 'Union Territory of Jammu and Kashmir', 'Union Territory of Ladakh']
```

```
[61] # Q17. Median of daily new cases across India ?

     median_new_cases = df.groupby('Date')['New cases'].sum().median()
     print(f"14. Median of Daily New Cases: {median_new_cases}")
```

```
14. Median of Daily New Cases: 1968.5
```

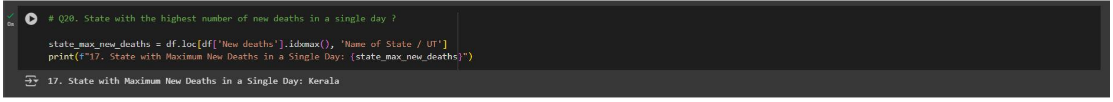
```
[60] # Q18. First date when a death was reported ?

     first_death_date = df[df['New deaths'] > 0]['Date'].min()
     print(f"16. First Date when Death was Reported: {first_death_date}")
```

```
16. First Date when Death was Reported: NaT
```



```
# 19. Total number of days recorded for each state ?

days_recorded_per_state = df['Name of State / UT'].value_counts()
print(f"18. Days Recorded per State:\n{days_recorded_per_state}")
```

```
18. Days Recorded per State:
Name of State / UT
Kerala                                        186
Delhi                                         154
Haryana                                       152
Rajasthan                                     152
Uttar Pradesh                                 152
Tamil Nadu                                    149
Maharashtra                                   147
Karnataka                                     147
Punjab                                        147
Andhra Pradesh                                144
Uttarakhand                                   141
Odisha                                        140
Puducherry                                    138
Chhattisgarh                                  137
Gujarat                                       136
Jammu and Kashmir                             135
Ladakh                                        135
Madhya Pradesh                                135
Himachal Pradesh                              135
Chandigarh                                    135
Bihar                                         134
Manipur                                       132
Mizoram                                       131
Andaman and Nicobar Islands                   130
Goa                                           130
West Bengal                                   128
Assam                                         124
Jharkhand                                     124
Arunachal Pradesh                             122
Tripura                                       118
Meghalaya                                     111
Telengana                                     102
Dadra and Nagar Haveli and Daman and Diu       89
Sikkim                                         71
Nagaland                                       69
Telangana                                      51
Union Territory of Ladakh                      14
Union Territory of Jammu and Kashmir           12
Union Territory of Chandigarh                   2
Telangana***                                    1
Name: count, dtype: int64
```



```
# Q20. State with the highest number of new deaths in a single day ?

state_max_new_deaths = df.loc[df['New deaths'].idxmax(), 'Name of State / UT']
print(f"17. State with Maximum New Deaths in a Single Day: {state_max_new_deaths}")
```

```
17. State with Maximum New Deaths in a Single Day: Kerala
```