PYTHON THEORY ACTIVITY 1

Details:

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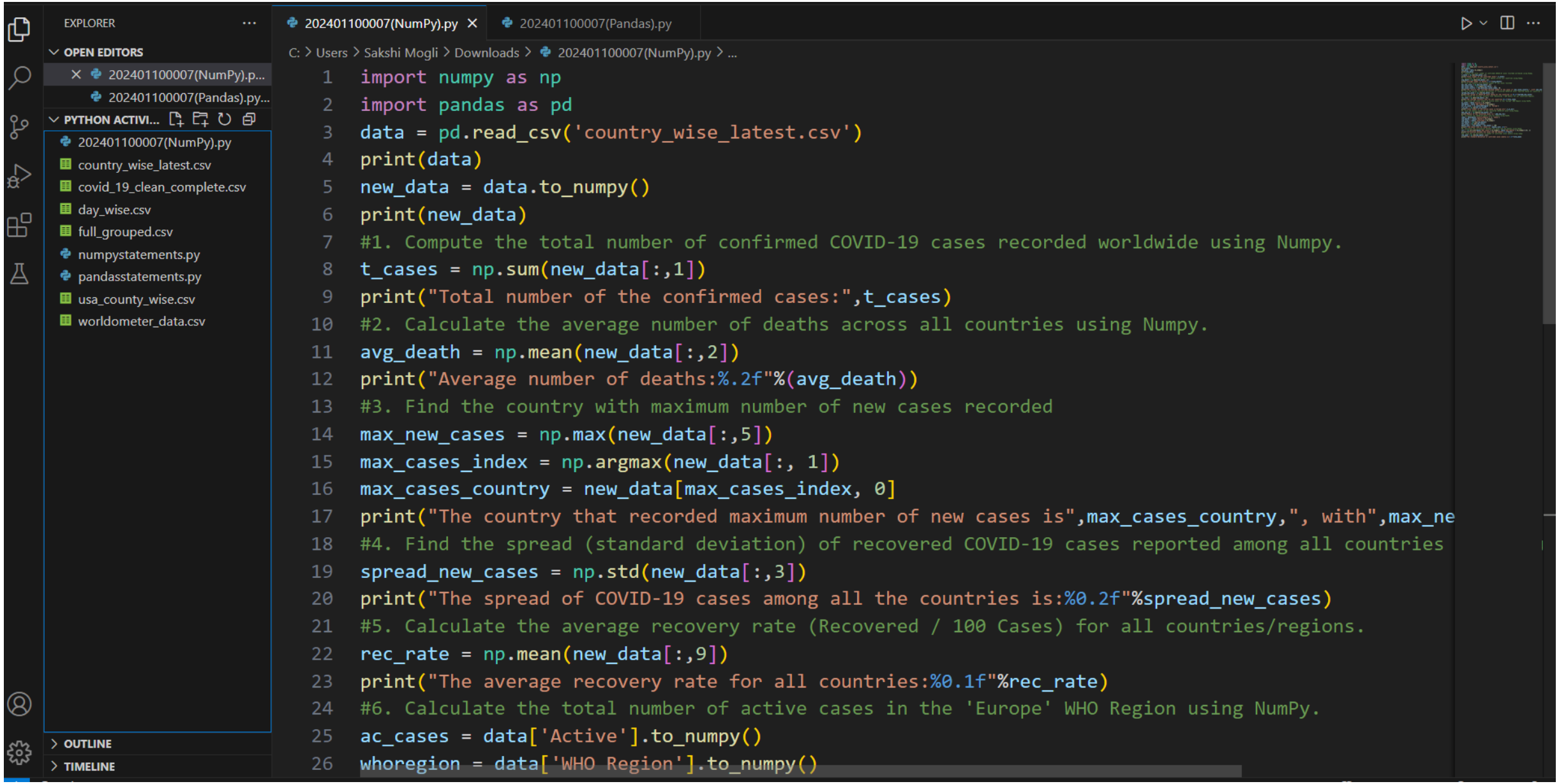
10 PROBLEM STATEMENTS ON NUMPY

1.Compute the total number of confirmed COVID-19 cases recorded worldwide using NumPy.
2. Calculate the average number of deaths across all countries using NumPy.
3. Find the country with maximum number of new cases recorded
4. Find the spread (standard deviation) of recovered COVID-19 cases reported among all countries using NumPy.
5. Calculate the average recovery rate (Recovered / 100 Cases) for all countries/regions.
6. Calculate the total number of active cases in the 'Europe' WHO Region using NumPy.
7. Find the median number of new recovered COVID-19 cases using NumPy.
8. Calculate the COVID-19 death rate for India using NumPy
9. Calculate the correlation between new cases and new deaths using NumPy.
10. Find the std deviation in number of confirmed cases weekly using NumPy.

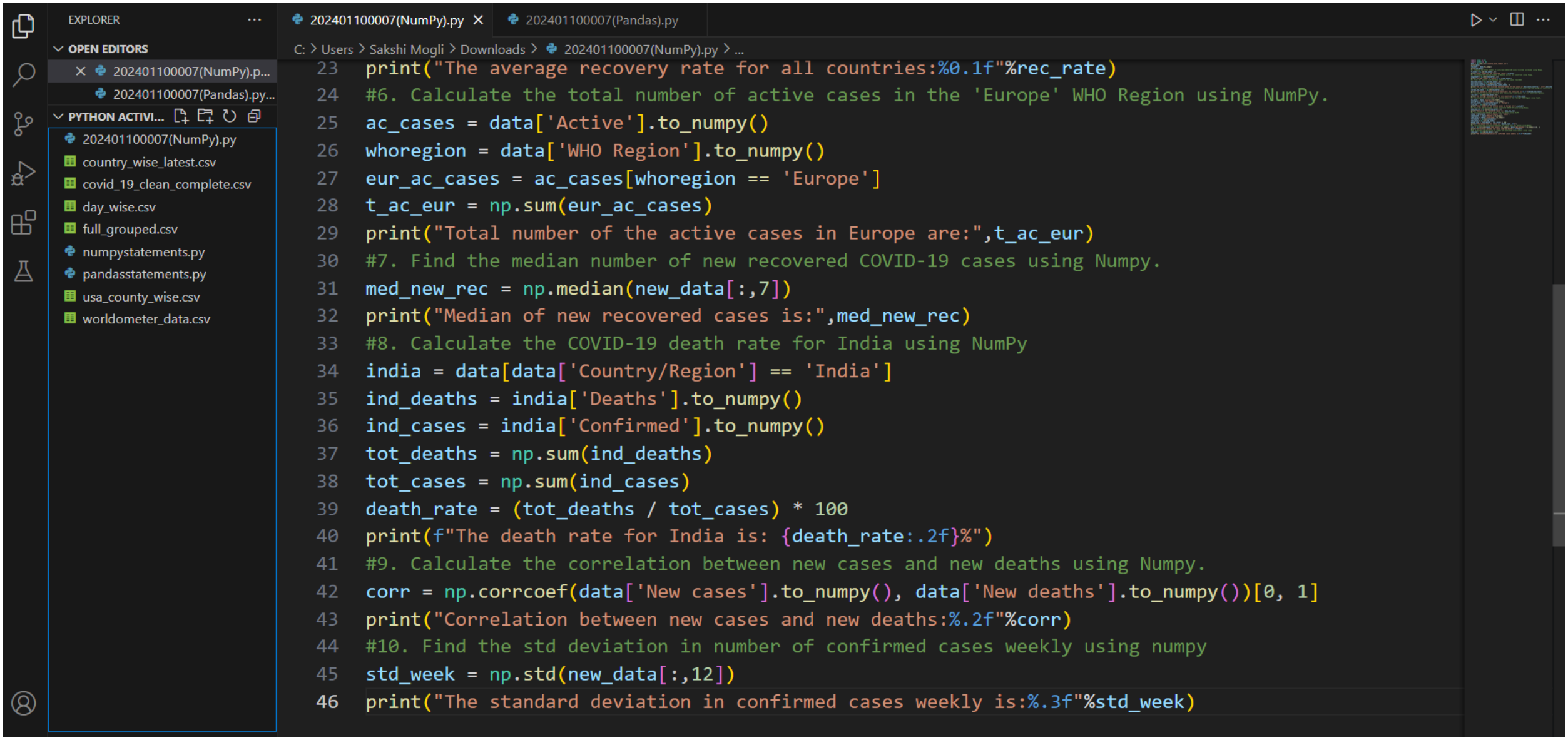
10 PROBLEM STATEMENTS ON PANDAS

1. Calculate the daily increase in the number of confirmed cases.
2. Find the day with the highest number of recoveries.
3. Find the day with the highest number of new cases
4. Calculate the death rate and recovery rate day-wise.
5. Find the day with maximum deaths reported.
6. Identify periods where active cases were consistently decreasing for at least 5 consecutive days.
7. What is the overall mortality rate at the end of the dataset?
8. Find the first day when more than 10,000 new cases were reported.
9. Find the average number of new cases reported daily.
10. Find the total number of confirmed cases, deaths, and recovered cases at the end.

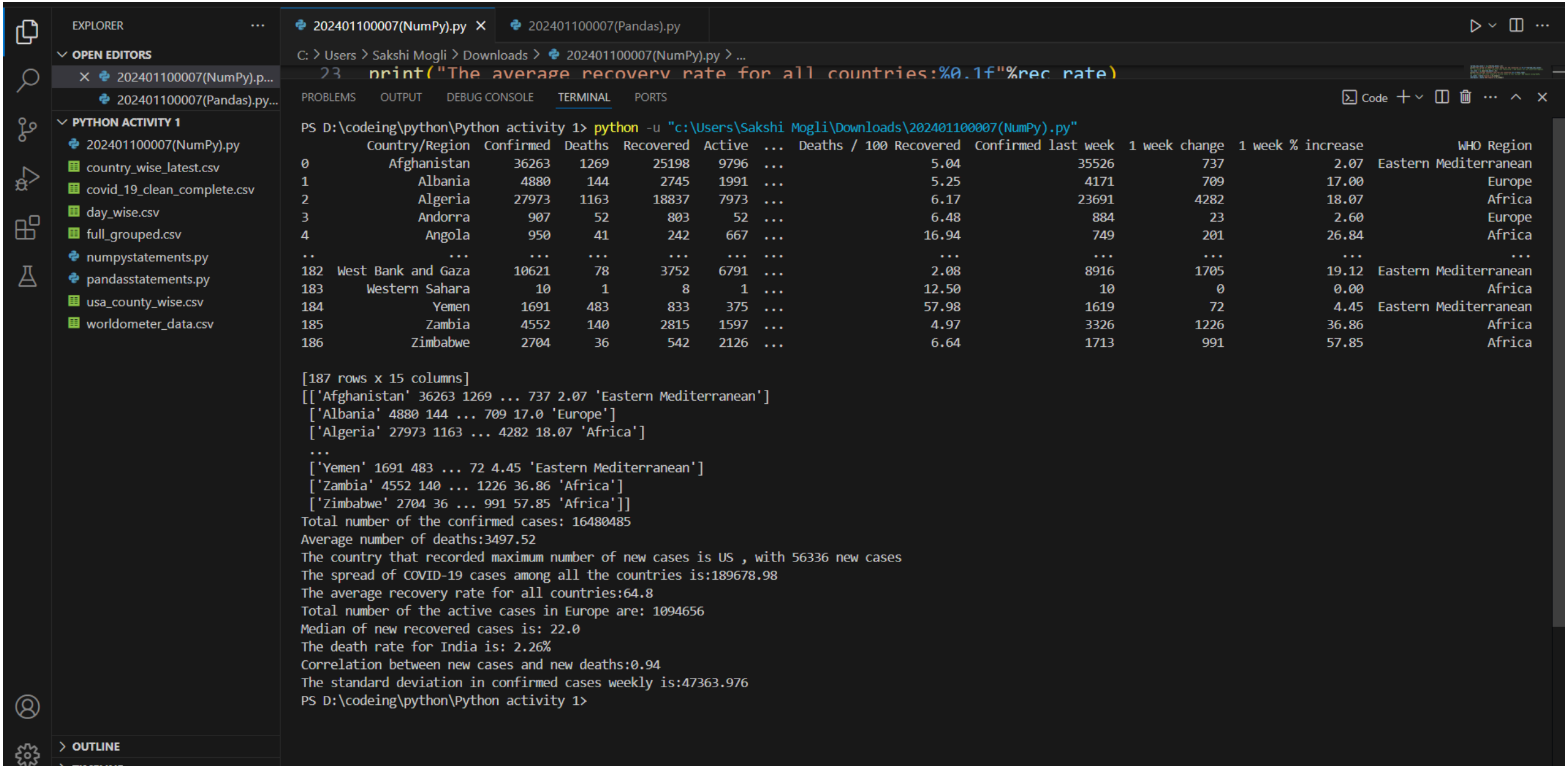
CODE FOR NUMPY STATEMENTS



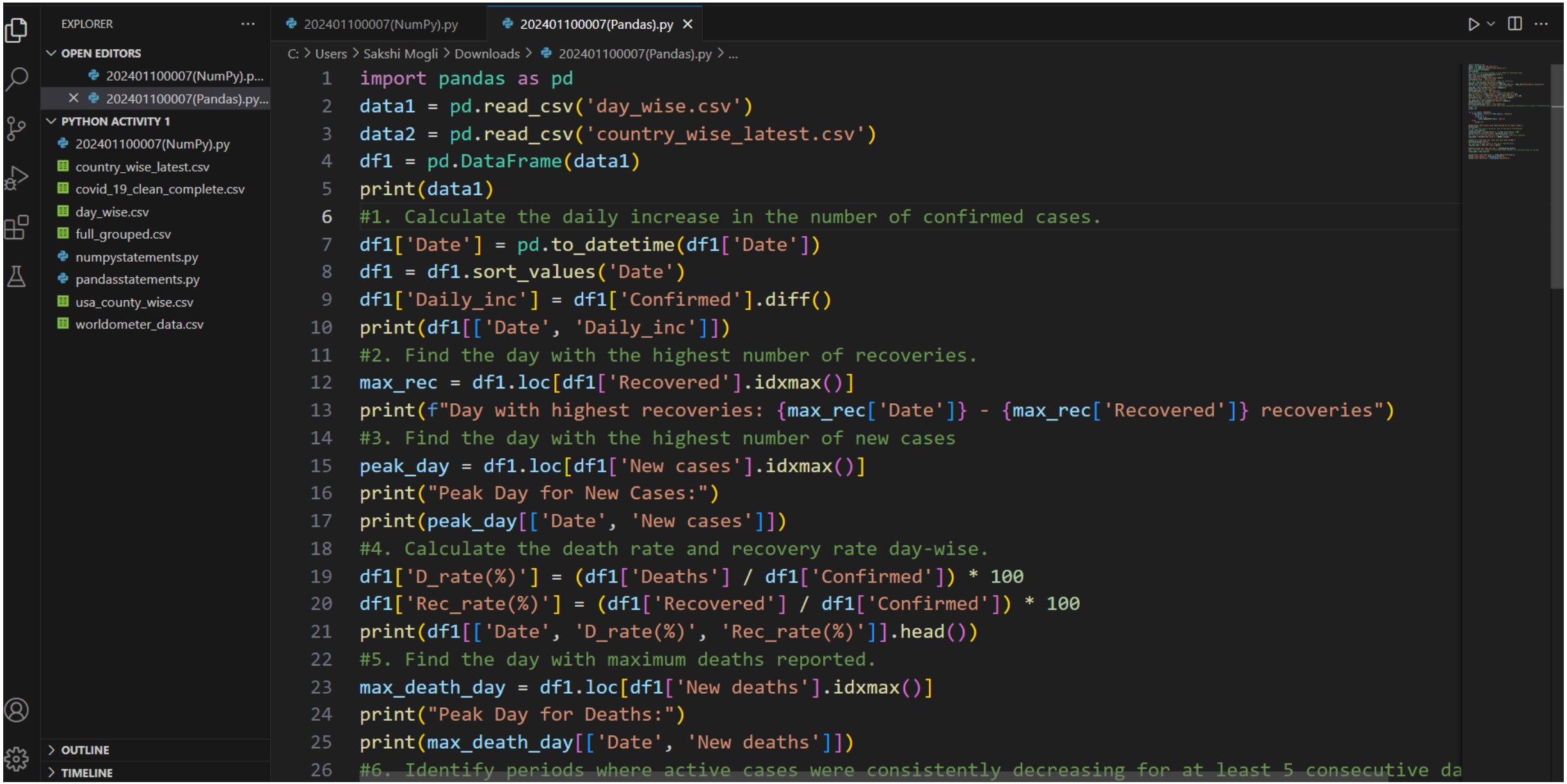
CODE FOR NUMPY STATEMENTS



OUTPUT FOR NUMPY STATEMENTS



CODE FOR PANDAS STATEMENTS



CODE FOR PANDAS STATEMENTS

202401100007(NumPy).py | 202401100007(Pandas).py

C: > Users > Sakshi Mogli > Downloads > 202401100007(Pandas).py > ...

```python
max_death_day = df1.loc[df1['New deaths'].idxmax()]
print("Peak Day for Deaths:")
print(max_death_day[['Date', 'New deaths']])
#6. Identify periods where active cases were consistently decreasing for at least 5 consecutive days.
d_dec = []
d_row = 0

for i in range(1, len(df1)):
    if df1.loc[i, 'Active'] < df1.loc[i-1, 'Active']:
        d_row += 1
        if d_row >= 5:
            d_dec.append(df1.loc[i, 'Date'])
    else:
        d_row = 0

print("Dates when active cases kept falling for at least 5 days:")
print(d_dec)
#7. What is the overall mortality rate at the end of the dataset?
f_row = df1.iloc[-1]
mortality_rate = (f_row['Deaths'] / f_row['Confirmed']) * 100
print(f"Overall Mortality Rate: {mortality_rate:.2f}%")
#8. Find the first day when more than 10,000 new cases were reported.
big_spike = df1[df1['New cases'] > 10000].iloc[0]

print("First date when new cases were more than 10,000:")
print(big_spike['Date'])
```

CODE FOR PANDAS STATEMENTS

202401100007(NumPy).py | 202401100007(Pandas).py

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```
40  #7. What is the overall mortality rate at the end of the dataset?
41  f_row = df1.iloc[-1]
42  mortality_rate = (f_row['Deaths'] / f_row['Confirmed']) * 100
43  print(f"Overall Mortality Rate: {mortality_rate:.2f}%")
44  #8. Find the first day when more than 10,000 new cases were reported.
45  big_spike = df1[df1['New cases'] > 10000].iloc[0]
46
47  print("First date when new cases were more than 10,000:")
48  print(big_spike['Date'])
49  #9. Find the average number of new cases reported daily.
50  avg_new_cases = df1['New cases'].mean()
51
52  print("Average new cases per day:", round(avg_new_cases))
53  #10. Find the total number of confirmed cases, deaths, and recovered cases at the end.
54  final_data = df1.iloc[-1]
55
56  print("Total Confirmed Cases:", final_data['Confirmed'])
57  print("Total Deaths:", final_data['Deaths'])
58  print("Total Recovered:", final_data['Recovered'])
```

OUTPUT FOR PANDAS STATEMENTS

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\codeing\python\Python activity 1> python -u "c:\Users\Sakshi Mogli\Downloads\202401100007(Pandas).py"
          Date  Confirmed  Deaths  Recovered  Active  New cases  New deaths  New recovered  Deaths / 100 Cases  Recovered / 100 Cases  Deaths / 100 Recovered  No. of countries
0   2020-01-22        555      17         28     510          0           0              0                3.06                   5.05                   60.71                 6
1   2020-01-23        654      18         30     606         99           1              2                2.75                   4.59                   60.00                 8
2   2020-01-24        941      26         36     879        287           8              6                2.76                   3.83                   72.22                 9
3   2020-01-25       1434      42         39    1353        493          16              3                2.93                   2.72                  107.69                11
4   2020-01-26       2118      56         52    2010        684          14             13                2.64                   2.46                  107.69                13
..         ...        ...     ...        ...     ...        ...         ...            ...                 ...                    ...                     ...               ...
183 2020-07-23   15510481  633506    8710969 6166006     282756        9966         169714                4.08                  56.16                    7.27               187
184 2020-07-24   15791645  639650    8939705 6212290     281164        6144         228736                4.05                  56.61                    7.16               187
185 2020-07-25   16047190  644517    9158743 6243930     255545        4867         219038                4.02                  57.07                    7.04               187
186 2020-07-26   16251796  648621    9293464 6309711     204606        4104         134721                3.99                  57.18                    6.98               187
187 2020-07-27   16480485  654036    9468087 6358362     228693        5415         174623                3.97                  57.45                    6.91               187

[188 rows x 12 columns]
          Date  Daily_inc
0   2020-01-22        NaN
1   2020-01-23       99.0
2   2020-01-24      287.0
3   2020-01-25      493.0
4   2020-01-26      684.0
..         ...        ...
183 2020-07-23   282756.0
184 2020-07-24   281164.0
185 2020-07-25   255545.0
186 2020-07-26   204606.0
187 2020-07-27   228689.0

[188 rows x 2 columns]
Day with highest recoveries: 2020-07-27 00:00:00 - 9468087 recoveries
Peak Day for New Cases:
Date         2020-07-23 00:00:00
New cases                 282756
Name: 183, dtype: object
        Date  D_rate(%)  Rec_rate(%)
0 2020-01-22   3.063063     5.045045
1 2020-01-23   2.752294     4.587156
2 2020-01-24   2.763018     3.825717
3 2020-01-25   2.928870     2.719665
4 2020-01-26   2.644004     2.455146
Peak Day for Deaths:
```

OUTPUT FOR PANDAS STATEMENTS

```
4 2020-01-26   2.644004     2.455146
Peak Day for Deaths:
Date          2020-07-23 00:00:00
New deaths                   9966
Name: 183, dtype: object
Dates when active cases kept falling for at least 5 days:
[Timestamp('2020-02-26 00:00:00'), Timestamp('2020-02-27 00:00:00'), Timestamp('2020-02-28 00:00:00'), Timestamp('2020-02-29 00:00:00'), Timestamp('2020-03-01 00:00:00'), Timestamp('2020-03-02 00:00:00
'), Timestamp('2020-03-03 00:00:00'), Timestamp('2020-03-04 00:00:00')]
Overall Mortality Rate: 3.97%
First date when new cases were more than 10,000:
2020-02-13 00:00:00
Average new cases per day: 87771
Total Confirmed Cases: 16480485
Total Deaths: 654036
Total Recovered: 9468087
PS D:\codeing\python\Python activity 1>
```

GOOGLE DRIVE LINK FOR ACCESSING CODES, OUTPUTS AND DATASETS IMPORTED

https://drive.google.com/drive/folders/1HOtGh5qO5J1ecVIIfNf-B5xODCuqPSKx?usp=sharing