

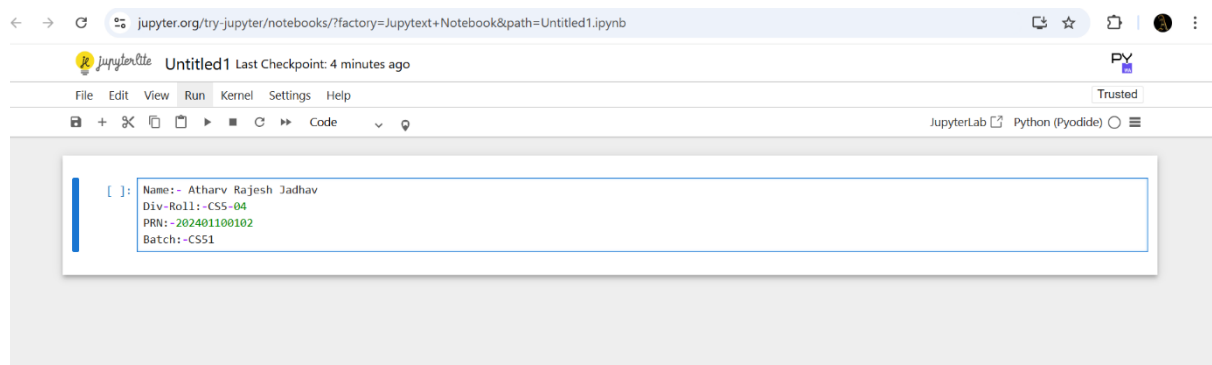
Theory Activity No. 1

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Dataset:- COVID 19 Dataset



Dataset on COVID-19 dataset

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	C
1	Country/Region	Confirmed	Deaths	Recovered	Active	New cases	New death	New recov	Deaths / 100000	Recovered	Deaths / 100000	Confirmed 1 week change	1 week % increase	WHO Region			
2	Afghanistan	36263	1269	25198	9796	106	10	18	3.5	69.49	5.04	35526	737	2.07	Eastern Mediterranean		
3	Albania	4880	144	2745	1991	117	6	63	2.95	56.25	5.25	4171	709	17	Europe		
4	Algeria	27973	1163	18837	7973	616	8	749	4.16	67.34	6.17	23691	4282	18.07	Africa		
5	Andorra	907	52	803	52	10	0	0	5.73	88.53	6.48	884	23	2.6	Europe		
6	Angola	950	41	242	667	18	1	0	4.32	25.47	16.94	749	201	26.84	Africa		
7	Antigua and Barbuda	86	3	65	18	4	0	5	3.49	75.58	4.62	76	10	13.16	Americas		
8	Argentina	167416	3059	72575	91782	4890	120	2057	1.83	43.35	4.21	130774	36642	28.02	Americas		
9	Armenia	37390	711	26665	10014	73	6	187	1.9	71.32	2.67	34981	2409	6.89	Europe		
10	Australia	15303	167	9311	5825	368	6	137	1.09	60.84	1.79	12428	2875	23.13	Western Pacific		
11	Austria	20558	713	18246	1599	86	1	37	3.47	88.75	3.91	19743	815	4.13	Europe		
12	Azerbaijan	30446	423	23242	6781	396	6	558	1.39	76.34	1.82	27890	2556	9.16	Europe		
13	Bahamas	382	11	91	280	40	0	0	2.88	23.82	12.09	174	208	119.54	Americas		
14	Bahrain	39482	141	36110	3231	351	1	421	0.36	91.46	0.39	36936	2546	6.89	Eastern Mediterranean		
15	Bangladesh	226225	2965	125683	97577	2772	37	1801	1.31	55.56	2.36	207453	18772	9.05	South-East Asia		
16	Barbados	110	7	94	9	0	0	0	6.36	85.45	7.45	106	4	3.77	Americas		
17	Belarus	67251	538	60492	6221	119	4	67	0.8	89.95	0.89	66213	1038	1.57	Europe		
18	Belgium	66428	9822	17452	39154	402	1	14	14.79	26.27	56.28	64094	2334	3.64	Europe		
19	Belize	48	2	26	20	0	0	0	4.17	54.17	7.69	40	8	20	Americas		
20	Benin	1770	35	1036	699	0	0	0	1.98	58.53	3.38	1602	168	10.49	Africa		
21	Bhutan	99	0	86	13	4	0	1	0	86.87	0	90	9	10	South-East Asia		
22	Bolivia	71181	2647	21478	47056	1752	64	309	3.72	30.17	12.32	60991	10190	16.71	Americas		
23	Bosnia and Herzegovina	10498	294	4930	5274	731	14	375	2.8	46.96	5.96	8479	2019	23.81	Europe		
24	Botswana	739	2	63	674	53	1	11	0.27	8.53	3.17	522	217	41.57	Africa		

10 Problem on Numpy with it's solution

```
import pandas as pd
import numpy as np

# Load the dataset
df = pd.read_csv('data/country_wise_latest.csv')

# Convert columns to NumPy arrays
confirmed = df['Confirmed'].values
deaths = df['Deaths'].values
recovered = df['Recovered'].values
active = df['Active'].values
new_cases = df['New cases'].values
new_deaths = df['New deaths'].values
new_recovered = df['New recovered'].values
one_week_change = df['1 week change'].values
one_week_percent_increase = df['1 week % increase'].values

print("10 NumPy problems")
print("1. Total confirmed cases:", np.sum(confirmed))
print("2. Average number of deaths:", np.mean(deaths))
print("3. Median of recovered cases:", np.median(recovered))
print("4. Standard deviation of active cases:", np.std(active))
print("5. Maximum new cases reported:", np.max(new_cases))
print("6. Minimum new deaths reported:", np.min(new_deaths))
print("7. 75th percentile of new recoveries:", np.percentile(new_recovered, 75))
print("8. Number of countries with new cases > 1000:", np.where(new_cases > 1000)[0].size)
print("9. Correlation between confirmed and deaths:", np.corrcoef(confirmed, deaths)[0, 1])
print("10. Country index with maximum 1 week change:", np.argmax(one_week_change))
```

Output of Given Question!

```
10 NumPy problems
1. Total confirmed cases: 16480485
2. Average number of deaths: 3497.51871657754
3. Median of recovered cases: 2815.0
4. Standard deviation of active cases: 212755.01793318504
5. Maximum new cases reported: 56336
6. Minimum new deaths reported: 0
7. 75th percentile of new recoveries: 221.0
8. Number of countries with new cases > 1000: 25
9. Correlation between confirmed and deaths: 0.9346984343393534
10. Country index with maximum 1 week change: 173
```

10 Problem on Pandas with it's solution

```
print("10 Pandas problem")
# Problem 1: Countries with new cases > 10,000
print("1: Countries with new cases > 10,000\n",df[df['New cases'] > 10000][['Country/Region', 'New cases']])

# Problem 2: Total confirmed cases per WHO region
print("2: Total confirmed cases per WHO region\n",df.groupby('WHO Region')['Confirmed'].sum())

# Problem 3: Top 5 countries with highest deaths
print(" 3: Top 5 countries with highest deaths\n",df.sort_values(by='Deaths', ascending=False).head(5)[['Country/Region', 'Deaths']])

# Problem 4: Countries with recovery rate > 90%
print("4: Countries with recovery rate > 90%\n",df[df['Recovered / 100 Cases'] > 90][['Country/Region', 'Recovered / 100 Cases']])

# Problem 5: Countries with death rate < 1%
print("5: Countries with death rate < 1%\n",df[df['Deaths / 100 Cases'] < 1][['Country/Region', 'Deaths / 100 Cases']])

# Problem 6: Average 1 week % increase
print("6: Average 1 week % increase\n",df['1 week % increase'].mean())

# Problem 7: Number of countries with zero new deaths
print("7: Number of countries with zero new deaths\n",df[df['New deaths'] == 0].shape[0])

# Problem 8: Countries with zero active cases
print("8: Countries with zero active cases\n",df[df['Active'] == 0][['Country/Region']])

# Problem 9: Average deaths per WHO region
print("9: Average deaths per WHO region\n",df.groupby('WHO Region')['Deaths'].mean())

# Problem 10: Countries with >50% weekly increase
print("10: Countries with >50% weekly increase\n",df[df['1 week % increase'] > 50][['Country/Region', '1 week % increase']])
```

Output of Given Question!

10 Pandas problem

1: Countries with new cases > 10,000

	Country/Region	New cases
23	Brazil	23284
37	Colombia	16306
79	India	44457
132	Peru	13756
173	US	56336

2: Total confirmed cases per WHO region

WHO Region	
Africa	723207
Americas	8839286
Eastern Mediterranean	1490744
Europe	3299523
South-East Asia	1835297
Western Pacific	292428

Name: Confirmed, dtype: int64

3: Top 5 countries with highest deaths

	Country/Region	Deaths
173	US	148011
23	Brazil	87618
177	United Kingdom	45844
111	Mexico	44022
85	Italy	35112

4: Countries with recovery rate > 90%

	Country/Region	Recovered / 100 Cases
12	Bahrain	91.46
24	Brunei	97.87
35	Chile	91.96
36	China	90.88
38	Comoros	92.66
44	Cuba	92.85
47	Denmark	91.60

4: Countries with recovery rate > 90%

	Country/Region	Recovered / 100 Cases
12	Bahrain	91.46
24	Brunei	97.87
35	Chile	91.96
36	China	90.88
38	Comoros	92.66
44	Cuba	92.85
47	Denmark	91.60
48	Djibouti	98.38
49	Dominica	100.00
56	Estonia	94.54
60	Finland	93.54
65	Germany	91.89
68	Greenland	92.86
69	Grenada	100.00
75	Holy See	100.00
78	Iceland	98.33
83	Ireland	90.24
94	Laos	95.00
100	Liechtenstein	94.19
105	Malaysia	96.60
108	Malta	94.86
110	Mauritius	96.51
121	New Zealand	97.24
123	Niger	90.72
126	Norway	95.84
136	Qatar	97.02
141	Saint Lucia	91.67
143	San Marino	93.99
155	South Korea	91.58
164	Taiwan*	95.24
167	Thailand	94.36
172	Turkey	92.71

5: Countries with death rate < 1%

	Country/Region	Deaths / 100 Cases
12	Bahrain	0.36
15	Belarus	0.80
19	Bhutan	0.00
22	Botswana	0.27
28	Burundi	0.26
29	Cabo Verde	0.95
30	Cambodia	0.00
41	Costa Rica	0.73
42	Cote d'Ivoire	0.61
49	Dominica	0.00
55	Eritrea	0.00
59	Fiji	0.00
62	Gabon	0.68
66	Ghana	0.50
68	Greenland	0.00
69	Grenada	0.00
71	Guinea	0.64
75	Holy See	0.00
78	Iceland	0.54
84	Israel	0.74
88	Jordan	0.94
89	Kazakhstan	0.69
92	Kuwait	0.68
94	Laos	0.00
103	Madagascar	0.94
106	Maldives	0.45
114	Mongolia	0.00
117	Mozambique	0.65
118	Namibia	0.43
119	Nepal	0.26
127	Oman	0.51
130	Papua New Guinea	0.00
131	Paraguay	0.95
136	Qatar	0.15
139	Rwanda	0.27
140	Saint Kitts and Nevis	0.00
141	Saint Lucia	0.00
142	Saint Vincent and the Grenadines	0.00
148	Seychelles	0.00
150	Singapore	0.05
158	Sri Lanka	0.39
165	Tajikistan	0.83
168	Timor-Leste	0.00
174	Uganda	0.18

180	Venezuela	0.91
181	Vietnam	0.00
182	West Bank and Gaza	0.73

6: Average 1 week % increase
13.606203208556147

7: Number of countries with zero new deaths
91

8: Countries with zero active cases

	Country/Region
24	Brunei
49	Dominica
69	Grenada
75	Holy See
143	San Marino

9: Average deaths per WHO region

	WHO Region
Africa	254.645833
Americas	9792.342857
Eastern Mediterranean	1742.681818
Europe	3770.428571
South-East Asia	4134.900000
Western Pacific	515.562500

Name: Deaths, dtype: float64

10: Countries with >50% weekly increase

	Country/Region	1 week % increase
11	Bahamas	119.54
63	Gambia	191.07
130	Papua New Guinea	226.32
186	Zimbabwe	57.85

THANK YOU!