

PythonFinalProject

May 14, 2025

```
[1]: # importing my libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px

#setting default plotting styles
sns.set(style="darkgrid")
plt.rcParams["figure.figsize"] = (12, 6)
```

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[ ]:
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```
[2]: # Loading COVID-19 data from Our World in Data
import pandas as pd
import requests

# Download the dataset directly from the source
url = "https://covid.ourworldindata.org/data/owid-covid-data.csv"
print("Downloading COVID-19 dataset from Our World in Data...")

df = pd.read_csv(url)
df.to_csv("owid-covid-data.csv", index=False)

print("Dataset downloaded and saved as 'owid-covid-data.csv'")
```

Downloading COVID-19 dataset from Our World in Data...
Dataset downloaded and saved as 'owid-covid-data.csv'

```
[3]: #loading my data
df = pd.read_csv('owid-covid-data.csv')
df.head()
```

```
[3]:
```

	iso_code	continent	location	date	total_cases	new_cases	\
0	AFG	Asia	Afghanistan	2020-01-05	0.0	0.0	
1	AFG	Asia	Afghanistan	2020-01-06	0.0	0.0	
2	AFG	Asia	Afghanistan	2020-01-07	0.0	0.0	
3	AFG	Asia	Afghanistan	2020-01-08	0.0	0.0	
4	AFG	Asia	Afghanistan	2020-01-09	0.0	0.0	

	new_cases_smoothed	total_deaths	new_deaths	new_deaths_smoothed	...	\
0	NaN	0.0	0.0	NaN	...	
1	NaN	0.0	0.0	NaN	...	
2	NaN	0.0	0.0	NaN	...	
3	NaN	0.0	0.0	NaN	...	
4	NaN	0.0	0.0	NaN	...	

	male_smokers	handwashing_facilities	hospital_beds_per_thousand	\
0	NaN	37.746	0.5	
1	NaN	37.746	0.5	
2	NaN	37.746	0.5	
3	NaN	37.746	0.5	
4	NaN	37.746	0.5	

	life_expectancy	human_development_index	population	\
0	64.83	0.511	41128772	
1	64.83	0.511	41128772	
2	64.83	0.511	41128772	
3	64.83	0.511	41128772	
4	64.83	0.511	41128772	

	excess_mortality_cumulative_absolute	excess_mortality_cumulative	\
0	NaN	NaN	
1	NaN	NaN	
2	NaN	NaN	
3	NaN	NaN	
4	NaN	NaN	

	excess_mortality	excess_mortality_cumulative_per_million
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN

[5 rows x 67 columns]

```
[4]: #data cleaning
#converting 'date' to datetime
df['date'] = pd.to_datetime(df['date'])

#selecting my country of interest

countries = ['United States', 'India', 'Kenya', 'South Africa', 'Nigeria']
df = df[df['location'].isin(countries)]
```

```

#dropping rows with missing critical values

df = df.dropna(subset=['total_cases', 'total_deaths'])

#fill interpolate numeric values

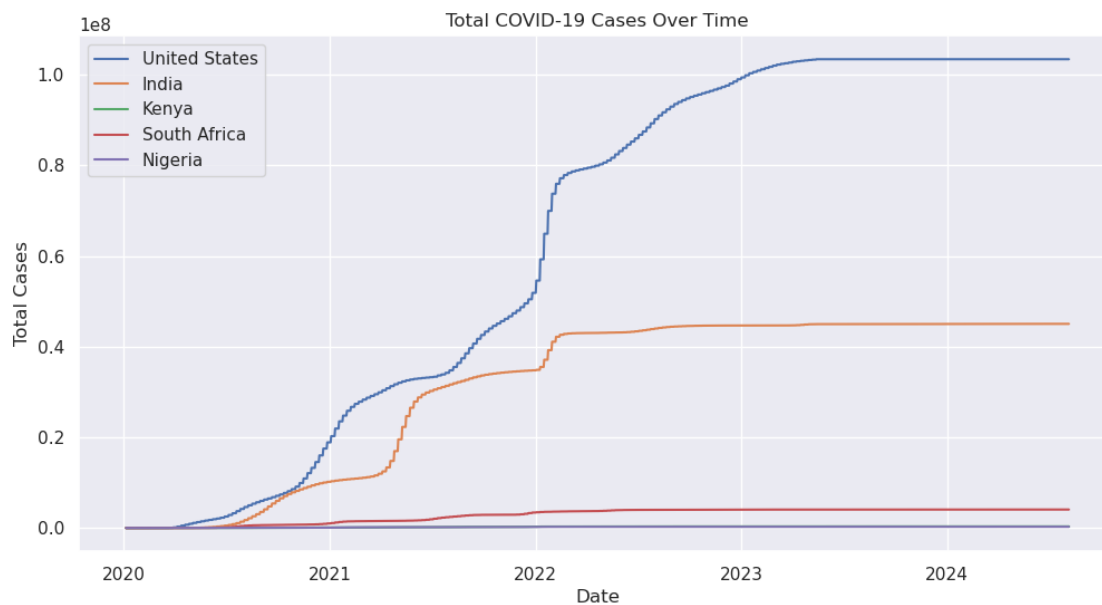
df[['total_cases', 'total_deaths', 'new_cases', 'new_deaths']] = \
    df[['total_cases', 'total_deaths', 'new_cases', 'new_deaths']].interpolate()

```

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[5]: # data analysis and plotting total cases over time
plt.figure()
for country in countries:
    subset = df[df['location'] == country]
    plt.plot(subset['date'], subset['total_cases'], label=country)
plt.title("Total COVID-19 Cases Over Time")
plt.xlabel("Date")
plt.ylabel("Total Cases")
plt.legend()
plt.show()

```



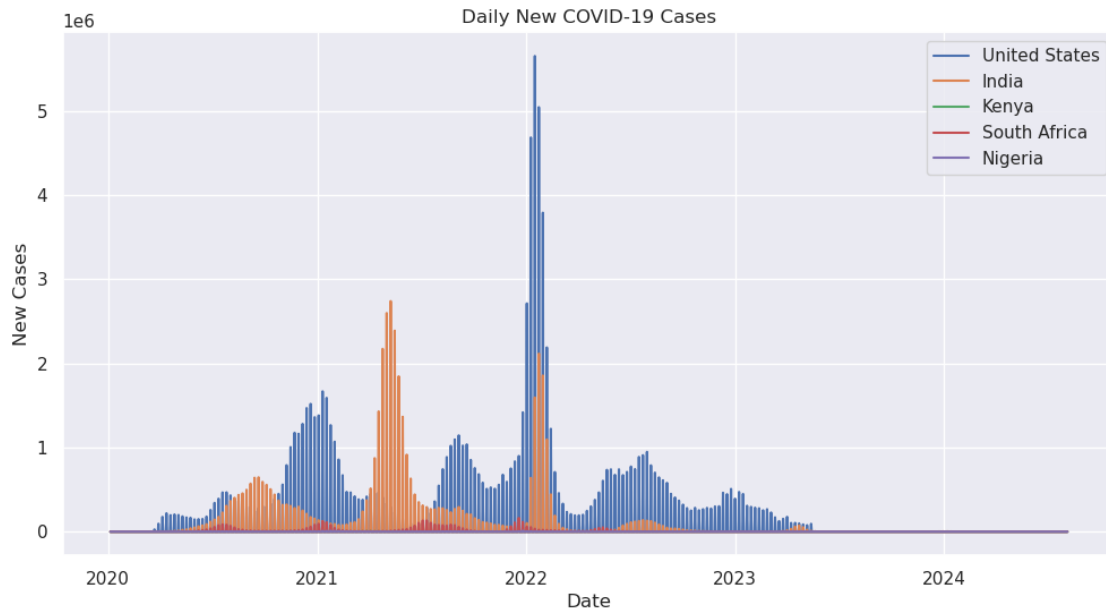
```

[6]: #plotting daily cases

plt.figure()
for country in countries:
    subset = df[df['location'] == country]
    plt.plot(subset['date'], subset['new_cases'], label=country)
plt.title("Daily New COVID-19 Cases")

```

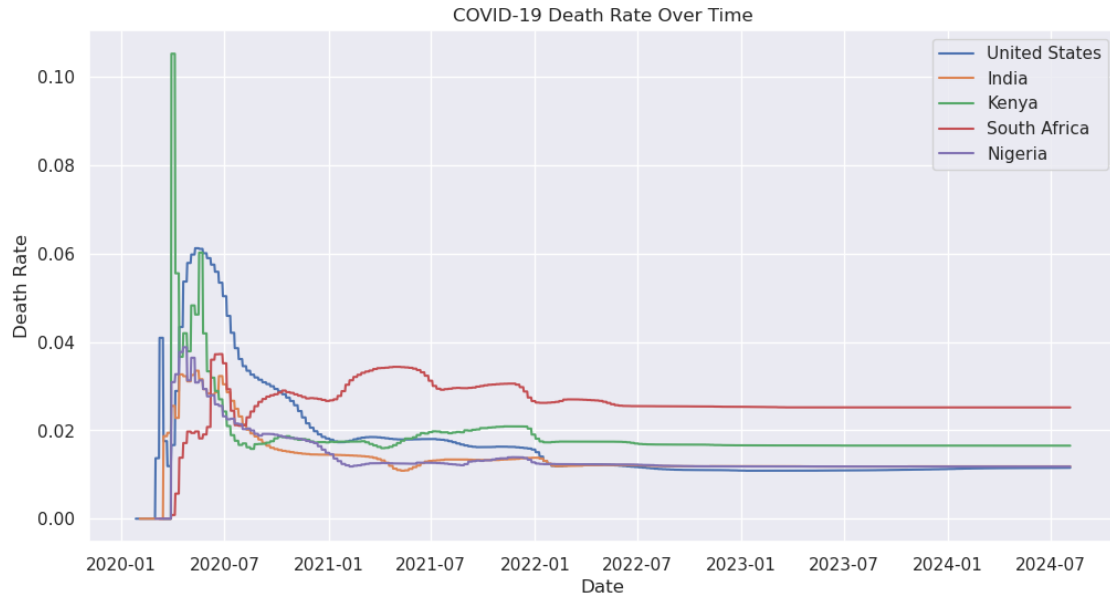
```
plt.xlabel("Date")
plt.ylabel("New Cases")
plt.legend()
plt.show()
```



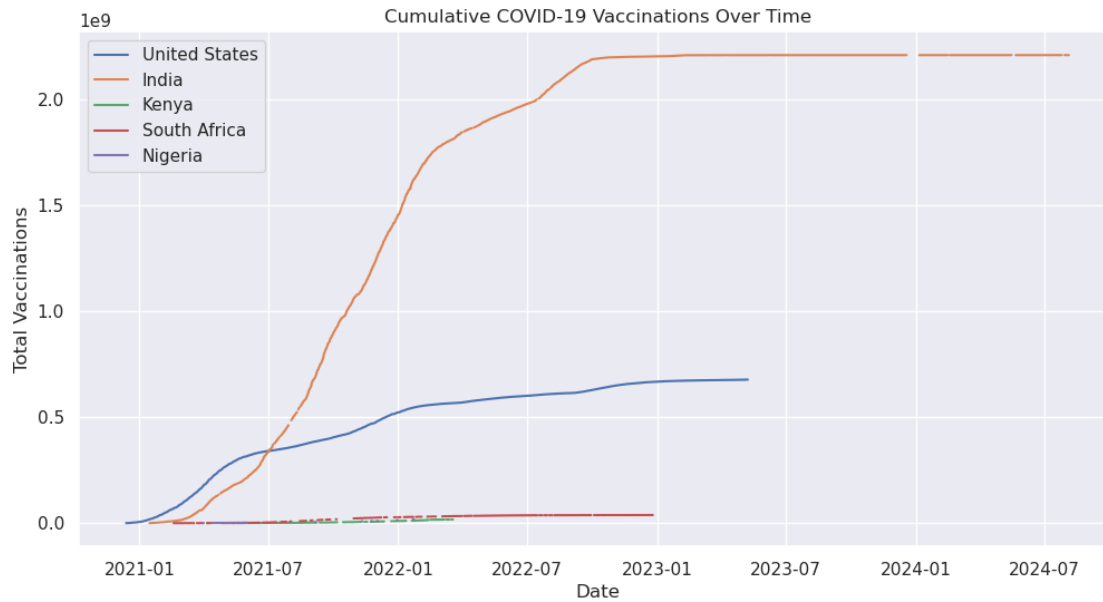
```
[7]: #calculating and plotting death rates

df['death_rate'] = df['total_deaths'] / df['total_cases']

plt.figure()
for country in countries:
    subset = df[df['location'] == country]
    plt.plot(subset['date'], subset['death_rate'], label=country)
plt.title("COVID-19 Death Rate Over Time")
plt.xlabel("Date")
plt.ylabel("Death Rate")
plt.legend()
plt.show()
```



```
[8]: # Vaccination analysis
plt.figure()
for country in countries:
    subset = df[df['location'] == country]
    plt.plot(subset['date'], subset['total_vaccinations'], label=country)
plt.title("Cumulative COVID-19 Vaccinations Over Time")
plt.xlabel("Date")
plt.ylabel("Total Vaccinations")
plt.legend()
plt.show()
```



```
[9]: #preparing latest data

latest_date = df['date'].max()
latest = df[df['date'] == latest_date]

#removing countries with no total cases

map_df = latest.dropna(subset=['iso_code', 'total_cases'])

fig = px.choropleth(map_df,
                    locations="iso_code",
                    color="total_cases",
                    hover_name="location",
                    color_continuous_scale="Reds",
                    title=f"Total COVID- 19 Cases by Country on{latest_date.
↪date()})")
fig.show()
```

Total COVID- 19 Cases by Country on2024-08-04



```
[10]: pip install ipywidgets
```

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Defaulting to user installation because normal site-packages is not writeable
Looking in links: /usr/share/pip-wheels
Requirement already satisfied: ipywidgets in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (8.1.2)
Requirement already satisfied: comm>=0.1.3 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets) (0.2.1)
Requirement already satisfied: ipython>=6.1.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets) (8.20.0)
Requirement already satisfied: traitlets>=4.3.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets) (5.7.1)
Requirement already satisfied: widgetsnbextension~=4.0.10 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets) (4.0.10)
Requirement already satisfied: jupyterlab-widgets~=3.0.10 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets) (3.0.10)
Requirement already satisfied: decorator in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (5.1.1)
Requirement already satisfied: jedi>=0.16 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (0.18.1)
Requirement already satisfied: matplotlib-inline in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
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ipython>=6.1.0->ipywidgets) (0.1.6)
Requirement already satisfied: prompt-toolkit<3.1.0,>=3.0.41 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (3.0.43)
Requirement already satisfied: pygments>=2.4.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (2.15.1)
Requirement already satisfied: stack-data in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (0.2.0)
Requirement already satisfied: exceptiongroup in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (1.2.0)
Requirement already satisfied: pexpect>4.3 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=6.1.0->ipywidgets) (4.8.0)
Requirement already satisfied: parso<0.9.0,>=0.8.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jedi>=0.16->ipython>=6.1.0->ipywidgets) (0.8.3)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pexpect>4.3->ipython>=6.1.0->ipywidgets) (0.7.0)
Requirement already satisfied: wcwidth in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
prompt-toolkit<3.1.0,>=3.0.41->ipython>=6.1.0->ipywidgets) (0.2.5)
Requirement already satisfied: executing in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=6.1.0->ipywidgets) (0.8.3)
Requirement already satisfied: asttokens in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=6.1.0->ipywidgets) (2.0.5)
Requirement already satisfied: pure-eval in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=6.1.0->ipywidgets) (0.2.2)
Requirement already satisfied: six in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
asttokens->stack-data->ipython>=6.1.0->ipywidgets) (1.16.0)
Note: you may need to restart the kernel to use updated packages.

```

```

[11]: import pandas as pd
import matplotlib.pyplot as plt
import ipywidgets as widgets
from IPython.display import display

# Load my dataset
df = pd.read_csv("owid-covid-data.csv", parse_dates=["date"])

```



```

# Filtering out all the entries with missing location
df = df[df['location'].notna()]

# Creating a widgets
countries = df['location'].dropna().unique()
country_selector = widgets.Dropdown(options=sorted(countries),
    ↪description='Country:')
date_range = widgets.SelectionRangeSlider(
    options=sorted(df['date'].unique()),
    index=(0, len(df['date'].unique()) - 1),
    description='Date Range',
    orientation='horizontal',
    layout={'width': '800px'})

def plot_covid_data(country, date_range):
    filtered = df[(df['location'] == country) &
                  (df['date'] >= date_range[0]) &
                  (df['date'] <= date_range[1])]
    plt.figure(figsize=(12, 6))
    plt.plot(filtered['date'], filtered['total_cases'], label='Total Cases')
    plt.plot(filtered['date'], filtered['total_deaths'], label='Total Deaths')
    plt.title(f'COVID-19 in {country}')
    plt.xlabel('Date')
    plt.ylabel('Count')
    plt.legend()
    plt.grid(True)
    plt.show()

widgets.interact(plot_covid_data, country=country_selector,
    ↪date_range=date_range)

```

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interactive(children=(Dropdown(description='Country:', options=('Afghanistan',
    ↪'Africa', 'Albania', 'Algeria',...

```

```
[11]: <function __main__.plot_covid_data(country, date_range)>
```

```
[12]: pip install altair
```

```

Defaulting to user installation because normal site-packages is not writeable
Looking in links: /usr/share/pip-wheels
Requirement already satisfied: altair in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (5.0.1)
Requirement already satisfied: Jinja2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (3.1.3)
Requirement already satisfied: jsonschema>=3.0 in

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/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (4.19.2)
Requirement already satisfied: numpy in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (1.26.4)
Requirement already satisfied: pandas>=0.18 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (2.1.4)
Requirement already satisfied: toolz in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (0.12.0)
Requirement already satisfied: typing-extensions>=4.0.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair) (4.9.0)
Requirement already satisfied: attrs>=22.2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair) (23.1.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair) (2023.7.1)
Requirement already satisfied: referencing>=0.28.4 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair) (0.30.2)
Requirement already satisfied: rpds-py>=0.7.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair) (0.10.6)
Requirement already satisfied: python-dateutil>=2.8.2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pandas>=0.18->altair) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pandas>=0.18->altair) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pandas>=0.18->altair) (2023.3)
Requirement already satisfied: MarkupSafe>=2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jinja2->altair) (2.1.3)
Requirement already satisfied: six>=1.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
python-dateutil>=2.8.2->pandas>=0.18->altair) (1.16.0)
Note: you may need to restart the kernel to use updated packages.

```

```
[1]: pip install streamlit plotly pandas
```

```

Defaulting to user installation because normal site-packages is not writeable
Looking in links: /usr/share/pip-wheels
Requirement already satisfied: streamlit in ~/.local/lib/python3.10/site-

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packages (1.22.0)
Requirement already satisfied: plotly in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (5.19.0)
Requirement already satisfied: pandas in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (2.1.4)
Requirement already satisfied: altair<5,>=3.2.0 in ./local/lib/python3.10/site-packages (from streamlit) (4.2.2)
Requirement already satisfied: blinker>=1.0.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (1.6.2)
Requirement already satisfied: cachetools>=4.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (4.2.2)
Requirement already satisfied: click>=7.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (8.1.7)
Requirement already satisfied: importlib-metadata>=1.4 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (7.0.1)
Requirement already satisfied: numpy in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (1.26.4)
Requirement already satisfied: packaging>=14.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (23.2)
Requirement already satisfied: pillow>=6.2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (10.2.0)
Requirement already satisfied: protobuf<4,>=3.12 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (3.20.3)
Requirement already satisfied: pyarrow>=4.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (14.0.2)
Requirement already satisfied: pympler>=0.9 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (0.9)
Requirement already satisfied: python-dateutil in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (2.8.2)
Requirement already satisfied: requests>=2.4 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (2.31.0)
Requirement already satisfied: rich>=10.11.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from streamlit) (13.3.5)
Requirement already satisfied: tenacity<9,>=8.0.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from

streamlit) (8.2.2)
Requirement already satisfied: toml in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (0.10.2)
Requirement already satisfied: typing-extensions>=3.10.0.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (4.9.0)
Requirement already satisfied: tzlocal>=1.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (2.1)
Requirement already satisfied: validators>=0.2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (0.18.2)
Requirement already satisfied: gitpython!=3.1.19 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (3.1.37)
Requirement already satisfied: pydeck>=0.1.dev5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (0.7.1)
Requirement already satisfied: tornado>=6.0.3 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (6.3.3)
Requirement already satisfied: watchdog in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
streamlit) (2.1.6)
Requirement already satisfied: pytz>=2020.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pandas) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pandas) (2023.3)
Requirement already satisfied: entrypoints in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair<5,>=3.2.0->streamlit) (0.4)
Requirement already satisfied: jinja2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair<5,>=3.2.0->streamlit) (3.1.3)
Requirement already satisfied: jsonschema>=3.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair<5,>=3.2.0->streamlit) (4.19.2)
Requirement already satisfied: toolz in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
altair<5,>=3.2.0->streamlit) (0.12.0)
Requirement already satisfied: gitdb<5,>=4.0.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
gitpython!=3.1.19->streamlit) (4.0.7)
Requirement already satisfied: zipp>=0.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from

importlib-metadata>=1.4->streamlit) (3.17.0)
Requirement already satisfied: ipywidgets>=7.0.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pydeck>=0.1.dev5->streamlit) (8.1.2)
Requirement already satisfied: traitlets>=4.3.2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pydeck>=0.1.dev5->streamlit) (5.7.1)
Requirement already satisfied: ipykernel>=5.1.2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pydeck>=0.1.dev5->streamlit) (6.28.0)
Requirement already satisfied: six>=1.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
python-dateutil->streamlit) (1.16.0)
Requirement already satisfied: charset-normalizer<4,>=2 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
requests>=2.4->streamlit) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
requests>=2.4->streamlit) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
requests>=2.4->streamlit) (2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
requests>=2.4->streamlit) (2024.2.2)
Requirement already satisfied: markdown-it-py<3.0.0,>=2.2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
rich>=10.11.0->streamlit) (2.2.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
rich>=10.11.0->streamlit) (2.15.1)
Requirement already satisfied: decorator>=3.4.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
validators>=0.2->streamlit) (5.1.1)
Requirement already satisfied: smmap<5,>=3.0.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
gitdb<5,>=4.0.1->gitpython!=3.1.19->streamlit) (4.0.0)
Requirement already satisfied: comm>=0.1.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.2.1)
Requirement already satisfied: debugpy>=1.6.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (1.6.7)
Requirement already satisfied: ipython>=7.23.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (8.20.0)
Requirement already satisfied: jupyter-client>=6.1.12 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from

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ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (8.6.0)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (5.5.0)
Requirement already satisfied: matplotlib-inline>=0.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.1.6)
Requirement already satisfied: nest-asyncio in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (1.6.0)
Requirement already satisfied: psutil in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (5.9.0)
Requirement already satisfied: pyzmq>=24 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (25.1.2)
Requirement already satisfied: widgetsnbextension~=4.0.10 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets>=7.0.0->pydeck>=0.1.dev5->streamlit) (4.0.10)
Requirement already satisfied: jupyterlab-widgets~=3.0.10 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipywidgets>=7.0.0->pydeck>=0.1.dev5->streamlit) (3.0.10)
Requirement already satisfied: MarkupSafe>=2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jinja2->altair<5,>=3.2.0->streamlit) (2.1.3)
Requirement already satisfied: attrs>=22.2.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair<5,>=3.2.0->streamlit) (23.1.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair<5,>=3.2.0->streamlit) (2023.7.1)
Requirement already satisfied: referencing>=0.28.4 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair<5,>=3.2.0->streamlit) (0.30.2)
Requirement already satisfied: rpds-py>=0.7.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jsonschema>=3.0->altair<5,>=3.2.0->streamlit) (0.10.6)
Requirement already satisfied: mdurl~=0.1 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
markdown-it-py<3.0.0,>=2.2.0->rich>=10.11.0->streamlit) (0.1.0)
Requirement already satisfied: jedi>=0.16 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.18.1)
Requirement already satisfied: prompt-toolkit<3.1.0,>=3.0.41 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (3.0.43)
Requirement already satisfied: stack-data in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from

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ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.2.0)
Requirement already satisfied: exceptiongroup in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (1.2.0)
Requirement already satisfied: pexpect>4.3 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (4.8.0)
Requirement already satisfied: platformdirs>=2.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jupyter-core!=5.0.*,>=4.12->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit)
(2.5.2)
Requirement already satisfied: parso<0.9.0,>=0.8.0 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
jedi>=0.16->ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit)
(0.8.3)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
pexpect>4.3->ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit)
(0.7.0)
Requirement already satisfied: wcwidth in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from
prompt-toolkit<3.1.0,>=3.0.41->ipython>=7.23.1->ipykernel>=5.1.2-
>pydeck>=0.1.dev5->streamlit) (0.2.5)
Requirement already satisfied: executing in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.8.3)
Requirement already satisfied: asttokens in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (2.0.5)
Requirement already satisfied: pure-eval in
/opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages (from stack-
data->ipython>=7.23.1->ipykernel>=5.1.2->pydeck>=0.1.dev5->streamlit) (0.2.2)
Note: you may need to restart the kernel to use updated packages.

```

```

[3]: import streamlit as st
import pandas as pd
import plotly.express as px

# Load Data
@st.cache_data
def load_data():
    df = pd.read_csv("owid-covid-data.csv")
    df["date"] = pd.to_datetime(df["date"])
    return df

df = load_data()

```

```

# Sidebar Filters
st.sidebar.header("Filters")
selected_country = st.sidebar.selectbox("Select a Country", df["location"].
    ↪unique())
selected_metric = st.sidebar.radio("Metric", ["total_cases", "total_deaths",
    ↪"total_vaccinations"])

# Filter Data
country_df = df[df["location"] == selected_country]

# Visualization
fig = px.line(country_df, x="date", y=selected_metric,
    ↪title=f"{selected_country} - {selected_metric} Over Time")
st.plotly_chart(fig)

# Choropleth Map
latest_df = df[df["date"] == df["date"].max()]
fig_map = px.choropleth(latest_df, locations="iso_code", color=selected_metric,
    title=f"Global {selected_metric} Distribution",
    hover_name="location",
    color_continuous_scale=px.colors.sequential.Plasma)
st.plotly_chart(fig_map)

st.write("### Key Insights")
st.write("- Identify peak case and vaccination trends.")
st.write("- Compare different country patterns.")

### How to Run ###
# 1. Save this script as `app.py`.
# 2. Install Streamlit: `pip install streamlit plotly pandas`
# 3. Run the app: `streamlit run app.py`

```

2025-05-14 10:36:15.657 WARNING streamlit.runtime.caching.cache_data_api: No runtime found, using MemoryCacheStorageManager

2025-05-14 10:36:15.843

Warning: to view this Streamlit app on a browser, run it with the following command:

```
streamlit run /opt/conda/envs/anaconda-2024.02-py310/lib/python3.10/site-packages/ipykernel_launcher.py [ARGUMENTS]
```

2025-05-14 10:36:15.844 No runtime found, using MemoryCacheStorageManager

[]: