week7-proj10

September 3, 2023

[1]:
```
import pandas as pd
```

[2]:
```
df = pd.read_csv("country_vaccinations.csv")
```

[3]:
```
df
```

[3]:
```
           country iso_code        date  total_vaccinations  \
0      Afghanistan      AFG  2021-02-22                 0.0
1      Afghanistan      AFG  2021-02-23                 NaN
2      Afghanistan      AFG  2021-02-24                 NaN
3      Afghanistan      AFG  2021-02-25                 NaN
4      Afghanistan      AFG  2021-02-26                 NaN
…              …      …          …                   …
86507     Zimbabwe      ZWE  2022-03-25           8691642.0
86508     Zimbabwe      ZWE  2022-03-26           8791728.0
86509     Zimbabwe      ZWE  2022-03-27           8845039.0
86510     Zimbabwe      ZWE  2022-03-28           8934360.0
86511     Zimbabwe      ZWE  2022-03-29           9039729.0

       people_vaccinated  people_fully_vaccinated  daily_vaccinations_raw  \
0                    0.0                      NaN                     NaN
1                    NaN                      NaN                     NaN
2                    NaN                      NaN                     NaN
3                    NaN                      NaN                     NaN
4                    NaN                      NaN                     NaN
…                      …                        …                       …
86507          4814582.0                3473523.0                139213.0
86508          4886242.0                3487962.0                100086.0
86509          4918147.0                3493763.0                 53311.0
86510          4975433.0                3501493.0                 89321.0
86511          5053114.0                3510256.0                105369.0

       daily_vaccinations  total_vaccinations_per_hundred  \
0                     NaN                            0.00
1                  1367.0                             NaN
2                  1367.0                             NaN
3                  1367.0                             NaN
```

```
4                  1367.0                              NaN
…                     …                                …
86507             69579.0                            57.59
86508             83429.0                            58.25
86509             90629.0                            58.61
86510            100614.0                            59.20
86511            103751.0                            59.90

       people_vaccinated_per_hundred  people_fully_vaccinated_per_hundred  \
0                                0.00                                  NaN
1                                 NaN                                  NaN
2                                 NaN                                  NaN
3                                 NaN                                  NaN
4                                 NaN                                  NaN
…                                 …                                    …
86507                           31.90                                23.02
86508                           32.38                                23.11
86509                           32.59                                23.15
86510                           32.97                                23.20
86511                           33.48                                23.26

       daily_vaccinations_per_million  \
0                                 NaN
1                                34.0
2                                34.0
3                                34.0
4                                34.0
…                                 …
86507                          4610.0
86508                          5528.0
86509                          6005.0
86510                          6667.0
86511                          6874.0

                                                 vaccines  \
0      Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
1      Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
2      Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
3      Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
4      Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
…                                                    …
86507  Oxford/AstraZeneca, Sinopharm/Beijing, Sinovac…
86508  Oxford/AstraZeneca, Sinopharm/Beijing, Sinovac…
86509  Oxford/AstraZeneca, Sinopharm/Beijing, Sinovac…
86510  Oxford/AstraZeneca, Sinopharm/Beijing, Sinovac…
86511  Oxford/AstraZeneca, Sinopharm/Beijing, Sinovac…
```

```
                    source_name  \
0      World Health Organization
1      World Health Organization
2      World Health Organization
3      World Health Organization
4      World Health Organization
…                            …
86507         Ministry of Health
86508         Ministry of Health
86509         Ministry of Health
86510         Ministry of Health
86511         Ministry of Health

                                       source_website
0                                https://covid19.who.int/
1                                https://covid19.who.int/
2                                https://covid19.who.int/
3                                https://covid19.who.int/
4                                https://covid19.who.int/
…                                                    …
86507  https://www.arcgis.com/home/webmap/viewer.html…
86508  https://www.arcgis.com/home/webmap/viewer.html…
86509  https://www.arcgis.com/home/webmap/viewer.html…
86510  https://www.arcgis.com/home/webmap/viewer.html…
86511  https://www.arcgis.com/home/webmap/viewer.html…

[86512 rows x 15 columns]
```

[4]:
```
df.head()
```

[4]:
```
       country iso_code        date  total_vaccinations  people_vaccinated  \
0  Afghanistan      AFG  2021-02-22                 0.0                 0.0
1  Afghanistan      AFG  2021-02-23                 NaN                 NaN
2  Afghanistan      AFG  2021-02-24                 NaN                 NaN
3  Afghanistan      AFG  2021-02-25                 NaN                 NaN
4  Afghanistan      AFG  2021-02-26                 NaN                 NaN

   people_fully_vaccinated  daily_vaccinations_raw  daily_vaccinations  \
0                      NaN                     NaN                 NaN
1                      NaN                     NaN              1367.0
2                      NaN                     NaN              1367.0
3                      NaN                     NaN              1367.0
4                      NaN                     NaN              1367.0

   total_vaccinations_per_hundred  people_vaccinated_per_hundred  \
0                             0.0                            0.0
1                             NaN                            NaN
```

```
2                                NaN                                NaN
3                                NaN                                NaN
4                                NaN                                NaN

   people_fully_vaccinated_per_hundred  daily_vaccinations_per_million  \
0                                  NaN                             NaN
1                                  NaN                            34.0
2                                  NaN                            34.0
3                                  NaN                            34.0
4                                  NaN                            34.0

                                        vaccines  \
0  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
1  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
2  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
3  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
4  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…

                 source_name            source_website
0  World Health Organization  https://covid19.who.int/
1  World Health Organization  https://covid19.who.int/
2  World Health Organization  https://covid19.who.int/
3  World Health Organization  https://covid19.who.int/
4  World Health Organization  https://covid19.who.int/
```

0.1 1)

[5]:
```
df['date_column'] = pd.to_datetime(df['date'])

df['year'] = df['date_column'].dt.year
```

[6]:
```
df.head()
```

[6]:
```
       country iso_code        date  total_vaccinations  people_vaccinated  \
0  Afghanistan      AFG  2021-02-22                 0.0                0.0
1  Afghanistan      AFG  2021-02-23                 NaN                NaN
2  Afghanistan      AFG  2021-02-24                 NaN                NaN
3  Afghanistan      AFG  2021-02-25                 NaN                NaN
4  Afghanistan      AFG  2021-02-26                 NaN                NaN

   people_fully_vaccinated  daily_vaccinations_raw  daily_vaccinations  \
0                      NaN                     NaN                 NaN
1                      NaN                     NaN              1367.0
2                      NaN                     NaN              1367.0
3                      NaN                     NaN              1367.0
4                      NaN                     NaN              1367.0
```

```
   total_vaccinations_per_hundred  people_vaccinated_per_hundred  \
0                             0.0                            0.0
1                             NaN                            NaN
2                             NaN                            NaN
3                             NaN                            NaN
4                             NaN                            NaN

   people_fully_vaccinated_per_hundred  daily_vaccinations_per_million  \
0                                  NaN                             NaN
1                                  NaN                            34.0
2                                  NaN                            34.0
3                                  NaN                            34.0
4                                  NaN                            34.0

                                        vaccines  \
0  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
1  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
2  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
3  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…
4  Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…

                source_name            source_website date_column  year
0  World Health Organization  https://covid19.who.int/  2021-02-22  2021
1  World Health Organization  https://covid19.who.int/  2021-02-23  2021
2  World Health Organization  https://covid19.who.int/  2021-02-24  2021
3  World Health Organization  https://covid19.who.int/  2021-02-25  2021
4  World Health Organization  https://covid19.who.int/  2021-02-26  2021
```

[7]:
```
india_vaccinations = df[(df['country'] == 'India') & (df['year'].isin([2020,␣
↪2021, 2022]))]
```

[8]:
```
in_2020 = india_vaccinations[india_vaccinations['year'] ==␣
↪2020]['total_vaccinations'].sum()
in_2021 = india_vaccinations[india_vaccinations['year'] ==␣
↪2021]['total_vaccinations'].sum()
in_2022 = india_vaccinations[india_vaccinations['year'] ==␣
↪2022]['total_vaccinations'].sum()
```

[9]:
```
print("Total vaccinations in India in 2020:",in_2020)
print("Total vaccinations in India in 2021:",in_2021)
print("Total vaccinations in India in 2022:",in_2022)
```

```
Total vaccinations in India in 2020: 0.0
Total vaccinations in India in 2021: 174118546779.0
Total vaccinations in India in 2022: 149321759019.0
```

0.2 2)

[10]:
```
india_2020= df[(df['country'] == 'India') & (df['year'] == 2020)]
usa_2020= df[(df['country'] == 'United States') & (df['year'] == 2020)]
```

[11]:
```
total_vacc_of_india = india_2020['total_vaccinations'].sum()
total_vacc_of_usa = usa_2020['total_vaccinations'].sum()
```

[12]:
```
print("Total vaccinations in India in 2020: ",total_vacc_of_india)
print("Total vaccinations in the USA in 2020:",total_vacc_of_usa)
```

```
Total vaccinations in India in 2020:  0.0
Total vaccinations in the USA in 2020: 41094416.0
```

0.3 3)

[13]:
```
india_2021= df[(df['country'] == 'India') & (df['year'] == 2021)]
china_2021= df[(df['country'] == 'China') & (df['year'] == 2021)]
```

[14]:
```
total_vacc_of_india1 = india_2021['total_vaccinations'].sum()
total_vacc_of_china = china_2021['total_vaccinations'].sum()
```

[15]:
```
print("Total vaccinations in India in 2021: ",total_vacc_of_india1)
print("Total vaccinations in the China in 2021:",total_vacc_of_china)
```

```
Total vaccinations in India in 2021:  174118546779.0
Total vaccinations in the China in 2021: 440076944700.0
```

0.4 4)

[16]:
```
india_2021 = df[(df['country'] == 'India') & (df['year'] == 2021)]
```

[17]:
```
india_2021['date'] = pd.to_datetime(india_2021['date'])
```

```
C:\Users\csc\AppData\Local\Temp\ipykernel_10928\3525414253.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  india_2021['date'] = pd.to_datetime(india_2021['date'])
```

[18]:
```
india_2021['month'] = india_2021['date'].dt.month
```

```
C:\Users\csc\AppData\Local\Temp\ipykernel_10928\4224709766.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
```

```
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  india_2021['month'] = india_2021['date'].dt.month
```

[19]:
```
monthly_vaccinations = india_2021.groupby('month')['total_vaccinations'].sum()
print("Monthly vaccinations in India in 2021:")
print(monthly_vaccinations)
```

```
Monthly vaccinations in India in 2021:
month
1     2.832321e+07
2     2.377621e+08
3     1.166007e+09
4     3.038130e+09
5     5.432545e+09
6     7.930055e+09
7     1.112970e+10
8     1.559347e+10
9     2.316289e+10
10    3.029975e+10
11    3.416499e+10
12    4.193492e+10
Name: total_vaccinations, dtype: float64
```

0.5 5)

[20]:
```
monthly_vaccinations = india_2021.groupby('month')['total_vaccinations'].sum()


most_vaccinations_month = monthly_vaccinations.idxmax()


print("The month with the most vaccinations in India in 2021 is␣
  ↪month",most_vaccinations_month)
```

```
The month with the most vaccinations in India in 2021 is month 12
```

[ ]:
```

```