untitled

October 16, 2023

[1]:

**import numpy as np import pandas as pd**

**import matplotlib.pyplot as plt import seaborn as sns**

[3]:

a=pd.read\_csv("country\_vaccinations\_by\_manufacturer.csv") a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [3]: | location | date | vaccine | total\_vaccinations |
| 0 | Argentina | 2020-12-29 | Moderna | 2 |
| 1 | Argentina | 2020-12-29 | Oxford/AstraZeneca | 3 |
| 2 | Argentina | 2020-12-29 | Sinopharm/Beijing | 1 |
| 3 | Argentina | 2020-12-29 | Sputnik V | 20481 |
| 4 | Argentina | 2020-12-30 | Moderna | 2 |
| … | … | … | … | … |
| 35618 | European Union | 2022-03-29 | Oxford/AstraZeneca | 67403106 |
| 35619 | European Union | 2022-03-29 | Pfizer/BioNTech | 600519998 |
| 35620 | European Union | 2022-03-29 | Sinopharm/Beijing | 2301516 |
| 35621 | European Union | 2022-03-29 | Sinovac | 1809 |
| 35622 | European Union | 2022-03-29 | Sputnik V | 1845103 |

[35623 rows x 4 columns]

[4]:

b=pd.read\_csv("country\_vaccinations.csv") b

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [4]: | 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  …  86507 | NaN  …  4814582.0 | NaN  …  3473523.0 | | | NaN  …  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  …  86507 | 1367.0  …  69579.0 | | NaN  …  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  …  86507 | NaN  …  31.90 | | | NaN  …  23.02 | | |  |
| 86508 | 32.38 | | | 23.11 | | |  |
| 86509 | 32.59 | | | 23.15 | | |  |
| 86510 | 32.97 | | | 23.20 | | |  |
| 86511 | 33.48 | | | 23.26 | | |  |
| 0 | daily\_vaccinations\_per\_million  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 | | | |
| 0 | vaccines 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  …  86507 | Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…  …  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… | | |  |
| 0 | World | source\_name Health Organization | \ | |
| 1 | World | Health Organization |  | |
| 2 | World | Health Organization |  | |
| 3 | World | Health Organization |  | |
| 4  …  86507 | World | Health Organization  …  Ministry of Health |  | |
| 86508 |  | Ministry of Health |  | |
| 86509 |  | Ministry of Health |  | |
| 86510 |  | Ministry of Health |  | |
| 86511 |  | Ministry of Health |  | |

source\_website

1. https://covid19.who.int/
2. https://covid19.who.int/
3. https://covid19.who.int/
4. https://covid19.who.int/
5. https://covid19.who.int/

… …

86507 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86508 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86509 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86510 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86511 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

[86512 rows x 15 columns]

[5]:

a.head()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [5]: | location  0 Argentina | date 2020-12-29 | vaccine total\_vaccinations Moderna 2 | |
| 1 Argentina 2020-12-29 Oxford/AstraZeneca | | | | 3 |
| 2 Argentina 2020-12-29 Sinopharm/Beijing | | | | 1 |
| 3 Argentina 2020-12-29 Sputnik V | | | | 20481 |
| 4 Argentina 2020-12-30 Moderna | | | | 2 |

[6]:

b.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 \

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…
5. Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi…

source\_name source\_website

[7]:

[8]:

[9]:

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/
5. World Health Organization https://covid19.who.int/

a.info()

<class 'pandas.core.frame.DataFrame'> RangeIndex: 35623 entries, 0 to 35622 Data columns (total 4 columns):

# Column Non-Null Count Dtype

|  |  |  |  |
| --- | --- | --- | --- |
| 0 |  | location | 35623 non-null object |
| 1 |  | date | 35623 non-null object |
| 2 |  | vaccine | 35623 non-null object |

3 total\_vaccinations 35623 non-null int64 dtypes: int64(1), object(3)

memory usage: 1.1+ MB

b.info()

<class 'pandas.core.frame.DataFrame'> RangeIndex: 86512 entries, 0 to 86511 Data columns (total 15 columns):

# Column Non-Null Count Dtype

1. country 86512 non-null object
2. iso\_code 86512 non-null object
3. date 86512 non-null object
4. total\_vaccinations 43607 non-null float64
5. people\_vaccinated 41294 non-null float64
6. people\_fully\_vaccinated 38802 non-null float64
7. daily\_vaccinations\_raw 35362 non-null float64
8. daily\_vaccinations 86213 non-null float64
9. total\_vaccinations\_per\_hundred 43607 non-null float64
10. people\_vaccinated\_per\_hundred 41294 non-null float64
11. people\_fully\_vaccinated\_per\_hundred 38802 non-null float64
12. daily\_vaccinations\_per\_million 86213 non-null float64
13. vaccines 86512 non-null object
14. source\_name 86512 non-null object
15. source\_website 86512 non-null object dtypes: float64(9), object(6)

memory usage: 9.9+ MB

a.describe()

|  |  |
| --- | --- |
| [9]: | total\_vaccinations |
| count | 3.562300e+04 |
| mean | 1.508357e+07 |
| std | 5.181768e+07 |
| min | 0.000000e+00 |
| 25% | 9.777600e+04 |
| 50% | 1.305506e+06 |
| 75% | 7.932423e+06 |
| max | 6.005200e+08 |

[10]:

b.describe()

[10]: total\_vaccinations people\_vaccinated people\_fully\_vaccinated \

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| count | 4.360700e+04 | 4.129400e+04 | | | 3.880200e+04 | |
| mean | 4.592964e+07 | 1.770508e+07 | | | 1.413830e+07 | |
| std | 2.246004e+08 | 7.078731e+07 | | | 5.713920e+07 | |
| min | 0.000000e+00 | 0.000000e+00 | | | 1.000000e+00 | |
| 25% | 5.264100e+05 | 3.494642e+05 | | | 2.439622e+05 | |
| 50% | 3.590096e+06 | 2.187310e+06 | | | 1.722140e+06 | |
| 75% | 1.701230e+07 | 9.152520e+06 | | | 7.559870e+06 | |
| max | 3.263129e+09 | 1.275541e+09 | | | 1.240777e+09 | |
| daily\_vaccinations\_raw daily\_vaccinations \ | | | | | | |
| count | 3.536200e+04 | 8.621300e+04 | | | | |
| mean | 2.705996e+05 | 1.313055e+05 | | | | |
| std | 1.212427e+06 | 7.682388e+05 | | | | |
| min | 0.000000e+00 | 0.000000e+00 | | | | |
| 25% | 4.668000e+03 | 9.000000e+02 | | | | |
| 50% | 2.530900e+04 | 7.343000e+03 | | | | |
| 75% | 1.234925e+05 | 4.409800e+04 | | | | |
| max | 2.474100e+07 | 2.242429e+07 | | | | |
|  | total\_vaccinations\_per\_hundred | | people\_vaccinated\_per\_hundred | | | \ |
| count | 43607.000000 | | 41294.000000 | | |  |
| mean | 80.188543 | | 40.927317 | | |  |
| std | 67.913577 | | 29.290759 | | |  |
| min | 0.000000 | | 0.000000 | | |  |
| 25% | 16.050000 | | 11.370000 | | |  |
| 50% | 67.520000 | | 41.435000 | | |  |
| 75% | 132.735000 | | 67.910000 | | |  |
| max | 345.370000 | | 124.760000 | | |  |
|  | people\_fully\_vaccinated\_per\_hundred | | | daily\_vaccinations\_per\_million | | |
| count | 38802.000000 | | | 86213.000000 | | |
| mean | 35.523243 | | | 3257.049157 | | |
| std | 28.376252 | | | 3934.312440 | | |
| min | 0.000000 | | | 0.000000 | | |

|  |  |  |
| --- | --- | --- |
| 25% | 7.020000 | 636.000000 |
| 50% | 31.750000 | 2050.000000 |
| 75% | 62.080000 | 4682.000000 |
| max | 122.370000 | 117497.000000 |

[12]:

a.shape

[12]: (35623, 4)

[13]:

b.shape

[13]: (86512, 15)

[14]:

a.isnull()

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [14]: |  | location | date | vaccine | total\_vaccinations |
|  | 0 | False | False | False | False |
|  | 1 | False | False | False | False |
|  | 2 | False | False | False | False |
|  | 3 | False | False | False | False |
|  | 4 | False | False | False | False |
|  | … | … … | … |  | … |
|  | 35618 | False | False | False | False |
|  | 35619 | False | False | False | False |
|  | 35620 | False | False | False | False |
|  | 35621 | False | False | False | False |
|  | 35622 | False | False | False | False |

[35623 rows x 4 columns]

[15]:

b.isnull()

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [15]: |  | country | iso\_code | date | total\_vaccinations | people\_vaccinated | \ |
|  | 0 | False | False | False | False | False |  |
|  | 1 | False | False | False | True | True |  |
|  | 2 | False | False | False | True | True |  |
|  | 3 | False | False | False | True | True |  |
|  | 4  …  86507 | False  …  False | False  … …  False | False  False | True  …  False | True  …  False |  |
|  | 86508 | False | False | False | False | False |  |
|  | 86509 | False | False | False | False | False |  |
|  | 86510 | False | False | False | False | False |  |
|  | 86511 | False | False | False | False | False |  |
| 0 | | people\_fully\_vaccinated  True | | | daily\_vaccinations\_raw daily\_vaccinations \  True True | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | True | | | |  | | True |  | False | |
| 2 | True | | | |  | | True |  | False | |
| 3 | True | | | |  | | True |  | False | |
| 4  …  86507 | True  …  False | | | | … | | True  False | … | False  False | |
| 86508 | False | | | |  | | False |  | False | |
| 86509 | False | | | |  | | False |  | False | |
| 86510 | False | | | |  | | False |  | False | |
| 86511 | False | | | |  | | False |  | False | |
|  | total\_vaccinations\_per\_hundred | | | | people\_vaccinated\_per\_hundred | | | | \ | |
| 0 | False | | | | False | | | |  | |
| 1 | True | | | | True | | | |  | |
| 2 | True | | | | True | | | |  | |
| 3 | True | | | | True | | | |  | |
| 4  …  86507 | True  …  False | | | | True  …  False | | | |  | |
| 86508 | False | | | | False | | | |  | |
| 86509 | False | | | | False | | | |  | |
| 86510 | False | | | | False | | | |  | |
| 86511 | False | | | | False | | | |  | |
|  | people\_fully\_vaccinated\_per\_hundred | | | | | daily\_vaccinations\_per\_million | | | | \ |
| 0 | True | | | | | True | | | |  |
| 1 | True | | | | | False | | | |  |
| 2 | True | | | | | False | | | |  |
| 3 | True | | | | | False | | | |  |
| 4  …  86507 | True  …  False | | | | | False  …  False | | | |  |
| 86508 | False | | | | | False | | | |  |
| 86509 | False | | | | | False | | | |  |
| 86510 | False | | | | | False | | | |  |
| 86511 | False | | | | | False | | | |  |
| vaccines source\_name source\_website | | | | | | | | | | |
| 0 | False |  | False |  | False | | | | | |
| 1 | False |  | False |  | False | | | | | |
| 2 | False |  | False |  | False | | | | | |
| 3 | False |  | False |  | False | | | | | |
| 4  …  86507 | False  …  False | … | False  False | … | False  False | | | | | |
| 86508 | False |  | False |  | False | | | | | |
| 86509 | False |  | False |  | False | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| 86510 | False | False | False |
| 86511 | False | False | False |

[86512 rows x 15 columns]

[16]:

a.notnull()

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [16]: |  | location | date | vaccine | total\_vaccinations |
|  | 0 | True | True | True | True |
|  | 1 | True | True | True | True |
|  | 2 | True | True | True | True |
|  | 3 | True | True | True | True |
|  | 4 | True | True | True | True |
|  | … | … … | … |  | … |
|  | 35618 | True | True | True | True |
|  | 35619 | True | True | True | True |
|  | 35620 | True | True | True | True |
|  | 35621 | True | True | True | True |
|  | 35622 | True | True | True | True |

[35623 rows x 4 columns]

[17]:

b.notnull()

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [17]: |  | country | | iso\_code | | date | total\_vaccinations | | people\_vaccinated | | \ |
|  | 0 | True | | True | | True | True | | True | |  |
|  | 1 | True | | True | | True | False | | False | |  |
|  | 2 | True | | True | | True | False | | False | |  |
|  | 3 | True | | True | | True | False | | False | |  |
|  | 4 | True | | True | | True | False | | False | |  |
| … | | … |  | … | … |  | … |  | … |  | |
| 86507 | |  | True |  | True | True |  | True |  | True | |
| 86508 | |  | True |  | True | True |  | True |  | True | |
| 86509 | |  | True |  | True | True |  | True |  | True | |
| 86510 | |  | True |  | True | True |  | True |  | True | |
| 86511 | |  | True |  | True | True |  | True |  | True | |

people\_fully\_vaccinated daily\_vaccinations\_raw daily\_vaccinations \

* 1. False False False
  2. False False True
  3. False False True
  4. False False True
  5. False False True

… … … …

86507 True True True

86508 True True True

86509 True True True

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 86510 | True | | | True | | True | |
| 86511 | True | | | True | | True | |
|  | total\_vaccinations\_per\_hundred | | | people\_vaccinated\_per\_hundred | | \ | |
| 0 | True | | | True | |  | |
| 1 | False | | | False | |  | |
| 2 | False | | | False | |  | |
| 3 | False | | | False | |  | |
| 4  …  86507 | False  …  True | | | False  …  True | |  | |
| 86508 | True | | | True | |  | |
| 86509 | True | | | True | |  | |
| 86510 | True | | | True | |  | |
| 86511 | True | | | True | |  | |
|  | people\_fully\_vaccinated\_per\_hundred | | | | daily\_vaccinations\_per\_million | | \ |
| 0 | False | | | | False | |  |
| 1 | False | | | | True | |  |
| 2 | False | | | | True | |  |
| 3 | False | | | | True | |  |
| 4  …  86507 | False  …  True | | | | True  …  True | |  |
| 86508 | True | | | | True | |  |
| 86509 | True | | | | True | |  |
| 86510 | True | | | | True | |  |
| 86511 | True | | | | True | |  |
|  | vaccines | source\_name | source\_website | | | | |
| 0 | True | True | True | | | | |
| 1 | True | True | True | | | | |
| 2 | True | True | True | | | | |
| 3 | True | True | True | | | | |
| 4 | True | True | True | | | | |
| … | … | … | … | | | | |
| 86507 | True | True | True | | | | |
| 86508 | True | True | True | | | | |
| 86509 | True | True | True | | | | |
| 86510 | True | True | True | | | | |
| 86511 | True | True | True | | | | |

[86512 rows x 15 columns]

[18]:

a.dropna()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [18]: | location | date | vaccine | total\_vaccinations |
| 0 | Argentina | 2020-12-29 | Moderna | 2 |
| 1 | Argentina | 2020-12-29 | Oxford/AstraZeneca | 3 |
| 2 | Argentina | 2020-12-29 | Sinopharm/Beijing | 1 |
| 3 | Argentina | 2020-12-29 | Sputnik V | 20481 |
| 4 | Argentina | 2020-12-30 | Moderna | 2 |
| … | … | … | … | … |
| 35618 | European Union | 2022-03-29 | Oxford/AstraZeneca | 67403106 |
| 35619 | European Union | 2022-03-29 | Pfizer/BioNTech | 600519998 |
| 35620 | European Union | 2022-03-29 | Sinopharm/Beijing | 2301516 |
| 35621 | European Union | 2022-03-29 | Sinovac | 1809 |
| 35622 | European Union | 2022-03-29 | Sputnik V | 1845103 |

[35623 rows x 4 columns]

[19]:

b.dropna()

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [19]: | country | iso\_code | date | total\_vaccinations | \ |
| 94 | Afghanistan | AFG | 2021-05-27 | 593313.0 |  |
| 101 | Afghanistan | AFG | 2021-06-03 | 630305.0 |  |
| 339 | Afghanistan | AFG | 2022-01-27 | 5081064.0 |  |
| 433 | Albania | ALB | 2021-02-18 | 3049.0 |  |
| 515 | Albania | ALB | 2021-05-11 | 622507.0 |  |
| … | … | … | … | … |  |
| 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 | | \ |
| 94 | 479574.0 | 113739.0 | 2859.0 | |  |
| 101 | 481800.0 | 148505.0 | 4015.0 | |  |
| 339 | 4517380.0 | 3868832.0 | 6868.0 | |  |
| 433 | 2438.0 | 611.0 | 1348.0 | |  |
| 515  …  86507 | 440921.0  …  4814582.0 | 181586.0  …  3473523.0 | 9548.0  …  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 | | \ | |
| 94 | 6487.0 | 1.49 | |  | |
| 101 | 5285.0 | 1.58 | |  | |
| 339 | 9802.0 | 12.76 | |  | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 433 | 254.0 |  | 0.11 | |
| 515  …  86507 | 12160.0  …  69579.0 | … | 21.67  57.59 | |
| 86508 | 83429.0 |  | 58.25 | |
| 86509 | 90629.0 |  | 58.61 | |
| 86510 | 100614.0 |  | 59.20 | |
| 86511 | 103751.0 |  | 59.90 | |
| 94 | people\_vaccinated\_per\_hundred people\_fully\_vaccinated\_per\_hundred  1.20 0.29 | | | \ |
| 101 | 1.21 0.37 | | |  |
| 339 | 11.34 9.71 | | |  |
| 433 | 0.08 0.02 | | |  |
| 515  …  86507 | 15.35 6.32  … …  31.90 23.02 | | |  |
| 86508 | 32.38 23.11 | | |  |
| 86509 | 32.59 23.15 | | |  |
| 86510 | 32.97 23.20 | | |  |
| 86511 | 33.48 23.26 | | |  |
| 94 | daily\_vaccinations\_per\_million \  163.0 | | |  |
| 101 | 133.0 | | |  |
| 339 | 246.0 | | |  |
| 433 | 88.0 | | |  |
| 515  …  86507 | 4233.0  …  4610.0 | | |  |
| 86508 | 5528.0 | | |  |
| 86509 | 6005.0 | | |  |
| 86510 | 6667.0 | | |  |
| 86511 | 6874.0 | | |  |
| 94 | vaccines \ Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi… | | |  |
| 101 | Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi… | | |  |
| 339 | Johnson&Johnson, Oxford/AstraZeneca, Pfizer/Bi… | | |  |
| 433 | Oxford/AstraZeneca, Pfizer/BioNTech, Sinovac, … | | |  |
| 515  …  86507 | Oxford/AstraZeneca, Pfizer/BioNTech, Sinovac, …  …  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 | \ |
| 94 | World | Health Organization |  |
| 101 | World | Health Organization |  |
| 339 | World | Health Organization |  |
| 433 |  | Ministry of Health |  |
| 515 |  | Ministry of Health |  |
| … |  | … |  |
| 86507 |  | Ministry of Health |  |
| 86508 |  | Ministry of Health |  |
| 86509 |  | Ministry of Health |  |
| 86510 |  | Ministry of Health |  |
| 86511 |  | Ministry of Health |  |

[20]:

a.dropna(axis='columns')

source\_website

94 https://covid19.who.int/

101 https://covid19.who.int/

339 https://covid19.who.int/

433 https://shendetesia.gov.al/vaksinimi-anticovid…

515 https://shendetesia.gov.al/vaksinimi-anticovid…

… …

86507 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86508 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86509 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86510 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86511 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

[30847 rows x 15 columns]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [20]: | location | date | vaccine | total\_vaccinations |
| 0 | Argentina | 2020-12-29 | Moderna | 2 |
| 1 | Argentina | 2020-12-29 | Oxford/AstraZeneca | 3 |
| 2 | Argentina | 2020-12-29 | Sinopharm/Beijing | 1 |
| 3 | Argentina | 2020-12-29 | Sputnik V | 20481 |
| 4 | Argentina | 2020-12-30 | Moderna | 2 |
| … | … | … | … | … |
| 35618 | European Union | 2022-03-29 | Oxford/AstraZeneca | 67403106 |
| 35619 | European Union | 2022-03-29 | Pfizer/BioNTech | 600519998 |
| 35620 | European Union | 2022-03-29 | Sinopharm/Beijing | 2301516 |
| 35621 | European Union | 2022-03-29 | Sinovac | 1809 |
| 35622 | European Union | 2022-03-29 | Sputnik V | 1845103 |

[35623 rows x 4 columns]

[21]:

b.dropna(axis='columns')

1. : country iso\_code date \
2. Afghanistan AFG 2021-02-22
3. Afghanistan AFG 2021-02-23
4. Afghanistan AFG 2021-02-24
5. Afghanistan AFG 2021-02-25
6. Afghanistan AFG 2021-02-26

… … … …

86507 Zimbabwe ZWE 2022-03-25

86508 Zimbabwe ZWE 2022-03-26

86509 Zimbabwe ZWE 2022-03-27

86510 Zimbabwe ZWE 2022-03-28

86511 Zimbabwe ZWE 2022-03-29

vaccines \

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…
5. 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… | | |
| 0 | World | source\_name Health Organization | \ |
| 1 | World | Health Organization |  |
| 2 | World | Health Organization |  |
| 3 | World | Health Organization |  |
| 4  … 86507 | World | Health Organization  … Ministry of Health |  |
| 86508 |  | Ministry of Health |  |
| 86509 |  | Ministry of Health |  |
| 86510 |  | Ministry of Health |  |
| 86511 |  | Ministry of Health |  |

source\_website

1. https://covid19.who.int/
2. https://covid19.who.int/
3. https://covid19.who.int/
4. https://covid19.who.int/
5. https://covid19.who.int/

… …

86507 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

[22]:

a.isnull().sum()

86508 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86509 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86510 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86511 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

[86512 rows x 6 columns]

1. : location 0

date 0

vaccine 0

total\_vaccinations 0

dtype: int64

[23]:

b.isnull().sum()

|  |  |  |
| --- | --- | --- |
| [23]: | country | 0 |
|  | iso\_code | 0 |
|  | date | 0 |
|  | total\_vaccinations | 42905 |
|  | people\_vaccinated | 45218 |
|  | people\_fully\_vaccinated | 47710 |
|  | daily\_vaccinations\_raw | 51150 |
|  | daily\_vaccinations | 299 |
|  | total\_vaccinations\_per\_hundred | 42905 |
|  | people\_vaccinated\_per\_hundred | 45218 |
|  | people\_fully\_vaccinated\_per\_hundred | 47710 |
|  | daily\_vaccinations\_per\_million | 299 |
|  | vaccines | 0 |
|  | source\_name | 0 |
|  | source\_website | 0 |
|  | dtype: int64 |  |

[24]:

a.fillna(0)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [24]: | location | date | vaccine | total\_vaccinations |
| 0 | Argentina | 2020-12-29 | Moderna | 2 |
| 1 | Argentina | 2020-12-29 | Oxford/AstraZeneca | 3 |
| 2 | Argentina | 2020-12-29 | Sinopharm/Beijing | 1 |
| 3 | Argentina | 2020-12-29 | Sputnik V | 20481 |
| 4 | Argentina | 2020-12-30 | Moderna | 2 |
| … | … | … | … | … |
| 35618 | European Union | 2022-03-29 | Oxford/AstraZeneca | 67403106 |
| 35619 | European Union | 2022-03-29 | Pfizer/BioNTech | 600519998 |
| 35620 | European Union | 2022-03-29 | Sinopharm/Beijing | 2301516 |
| 35621 | European Union | 2022-03-29 | Sinovac | 1809 |

[25]:

b.fillna(0)

35622 European Union 2022-03-29 Sputnik V 1845103

[35623 rows x 4 columns]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [25]: | country | iso\_code | date | total\_vaccinations | \ |
| 0 | Afghanistan | AFG | 2021-02-22 | 0.0 |  |
| 1 | Afghanistan | AFG | 2021-02-23 | 0.0 |  |
| 2 | Afghanistan | AFG | 2021-02-24 | 0.0 |  |
| 3 | Afghanistan | AFG | 2021-02-25 | 0.0 |  |
| 4 | Afghanistan | AFG | 2021-02-26 | 0.0 |  |
| … | … | … | … | … |  |
| 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 | 0.0 | 0.0 | |  |
| 1 | 0.0 | 0.0 | 0.0 | |  |
| 2 | 0.0 | 0.0 | 0.0 | |  |
| 3 | 0.0 | 0.0 | 0.0 | |  |
| 4  …  86507 | 0.0  …  4814582.0 | 0.0  …  3473523.0 | 0.0  …  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 | 0.0 | 0.00 | |  | |
| 1 | 1367.0 | 0.00 | |  | |
| 2 | 1367.0 | 0.00 | |  | |
| 3 | 1367.0 | 0.00 | |  | |
| 4  …  86507 | 1367.0  …  69579.0 | 0.00  …  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 0.00

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 0.00 |  |  |  |  | 0.00 |
| 2 | 0.00 |  |  |  |  | 0.00 |
| 3 | 0.00 |  |  |  |  | 0.00 |
| 4  …  86507 | 0.00  …  31.90 |  |  |  | … | 0.00  23.02 |
| 86508 | 32.38 |  |  |  |  | 23.11 |
| 86509 | 32.59 |  |  |  |  | 23.15 |
| 86510 | 32.97 |  |  |  |  | 23.20 |
| 86511 | 33.48 |  |  |  |  | 23.26 |
| 0 | daily\_vaccinations\_per\_million  0.0 | \ |  |  |  |  |
| 1 | 34.0 |  |  |  |  |  |
| 2 | 34.0 |  |  |  |  |  |
| 3 | 34.0 |  |  |  |  |  |
| 4  …  86507 | 34.0  …  4610.0 |  |  |  |  |  |
| 86508 | 5528.0 |  |  |  |  |  |
| 86509 | 6005.0 |  |  |  |  |  |
| 86510 | 6667.0 |  |  |  |  |  |
| 86511 | 6874.0 |  |  |  |  |  |
|  |  |  | vaccines | \ |  |  |

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…
5. 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 \

1. World Health Organization
2. World Health Organization
3. World Health Organization
4. World Health Organization
5. 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

[29]:

b=a['location'] b

1. https://covid19.who.int/
2. https://covid19.who.int/
3. https://covid19.who.int/
4. https://covid19.who.int/
5. https://covid19.who.int/

… …

86507 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86508 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86509 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86510 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

86511 [https://www.arcgis.com/home/webmap/viewer.html…](http://www.arcgis.com/home/webmap/viewer.html)

[86512 rows x 15 columns]

1. : 0 Argentina
   1. Argentina
   2. Argentina
   3. Argentina
   4. Argentina

…

35618 European Union

35619 European Union

35620 European Union

35621 European Union

35622 European Union

Name: location, Length: 35623, dtype: object

By:

|  |  |
| --- | --- |
| M.vignesh | 420421106045 |
| S.sanjay harish | 420421106034 |
| s.chitaardhan | 420421106009 |
| k.santhosh | 420421106035 |