The Foundations of Data Science Assignment Title Page:

Taslima Akter

Artificial Intelligence Diploma, PACE, University of Winnipeg

Course Name: Foundations of Data Science

Assignment 2: Collecting Initial Data

Student ID: 3040384

Professor's Name: Yelena Kropivnitskaya

March 14, 2022

Business/Research Objectives:

Already a major portion of the US citizens has been vaccinated by different brands.

- The main focus of the project is to measure the effectiveness of the Covid-19 vaccine in the USA.

Business Success Criteria:

- Effectiveness will be measured by comparing the death ratio of USA citizens before and after vaccination.

1.1 Data Collection Report:

Sl No.	Dataset Name	Location/Source	Acquisition Method	Data Issued Noted	Resolutions Achieved
1.	-Data on COVID-19 vaccinations of United States of America -In the pyhton program, dataset is stored in variable "dfUSVacc"	-Dataset Based on the data of United States of America. -URL-https://raw.githubusercontent.com/owid/covid-19-data/master/public/data/vaccinations/country_data/United%20States.csv	-I extracted dataset from website through pandas. - Data file was in CSV format.	-Dataset is clean. -Mentioned data are up to date. -Date wise fully-vaccination data are available in the dataset. - No missing data are noted in the fully vaccination column.	-Unnecessary columns are removed after loading dataset from website for the convenience of analysis. - Fully Vaccination data is grouped by months for analysis.
2.	-Covid-19 Data -In the python program, dataset is stored in variable "dfUSCovid19 Data".	-Dataset Based on the data of worldwide. -URL-https://raw.githubusercontent.com/datasets/covid-19/master/data/countries-aggregated.csv - After loading data file from the website I extracted only the USA data.	-I extracted dataset from website through pandas. - Data file was in CSV format.	-Data is updated. -Date wise Covid-19 confirmed cases and death rates are available. -No missing data.	-Only data of USA has been taken form the initial extracted file by applying filtering method. - Unnecessary columns are dropped. -Confirmed cases and deaths percentage are grouped by dates.

1.2 Data Description of Dataset-1 (COVID-19 vaccinations):

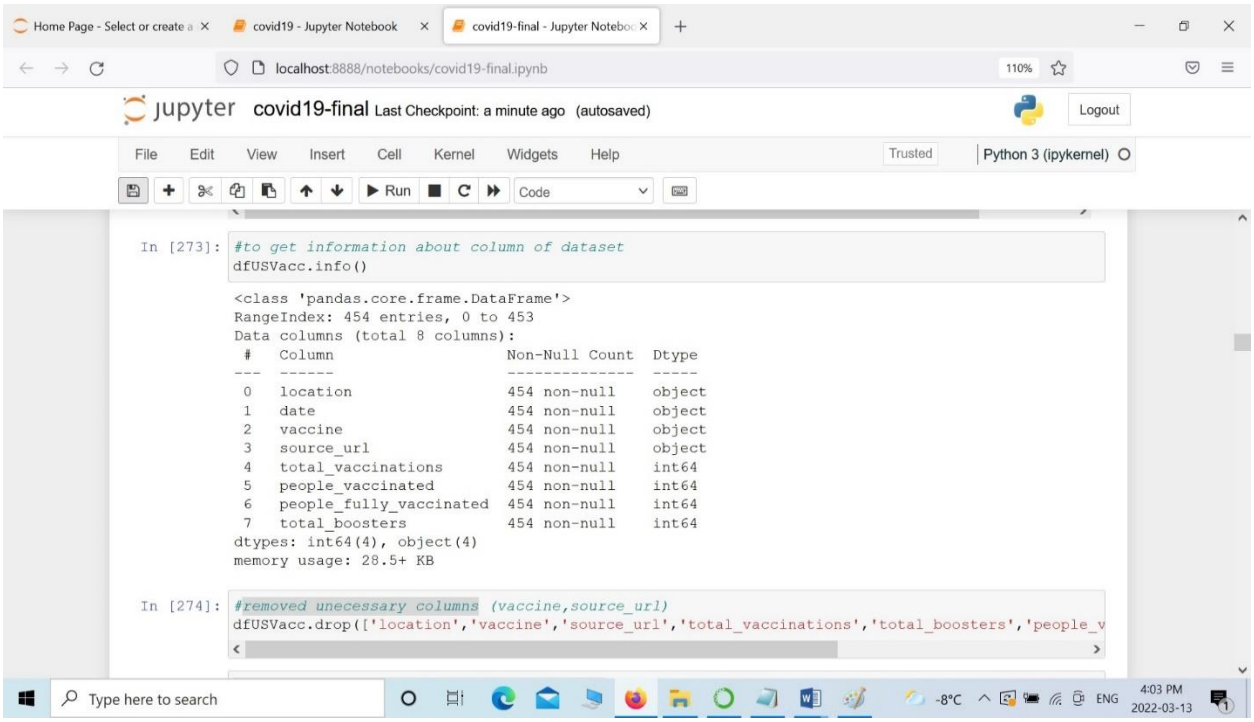
Dataset Contents: This dataset contains the data of COVID-19 vaccinations of United States of America. In the python program, dataset is stored in variable “dfUSVacc”.

Column Details:

-Initially there were total eight columns. Name of these eight columns are 'location', 'date', 'vaccine', 'source_url', 'total_vaccinations', 'people_vaccinated', 'people_fully_vaccinated', 'total_boosters'.

-Total two columns are considered for the analysis among these eight columns. Name of these two selected columns are 'date', 'people_fully_vaccinated'.

Datatypes of the Columns:



Observations:

-There are total 454 observations in the dataset.
- After summation of month wise data the total observations are 16.

Data Quality:

-Data is clear.
-No missing value.
-Desired data (date wise number of fully vaccination) are available for the analysis.

Remarks:

Details of the data are visible in the python program output, which is attached with the report.

1.3 Data Description of Dataset-2 (Covid-19 Data):

Dataset Contents: This dataset contains the data of Covid-19 Data of worldwide. In the python program, dataset is stored in variable “dfUSCovid19Data”.

Column Details:

-Initially there were total five columns. Name of the eight columns are 'date', 'Country', 'Confirmed', 'Recovered', 'Deaths'.

-Total two columns are considered for the analysis among these eight columns. Name of the two selected columns are 'date', 'Deaths'.

Datatypes of the Columns:

```
In [325]: dfUSCovid19Data.info()

          <class 'pandas.core.frame.DataFrame'>
          Int64Index: 759 entries, 142933 to 143691
          Data columns (total 5 columns):
           #   Column     Non-Null Count  Dtype
          ---  ------     --------------  -----
           0   date       759 non-null    object
           1   Country    759 non-null    object
           2   Confirmed  759 non-null    int64
           3   Recovered  759 non-null    int64
           4   Deaths     759 non-null    int64
          dtypes: int64(3), object(2)
          memory usage: 35.6+ KB
```

Observations:

-There are total 759 observations in the dataset.
- After summation of month wise data the observation becomes 25.

Data Quality:

-Data is clear.
-No missing value.
-Desired data are available (date wise confirmed positive cases and deaths are available, date rates has been calculated from the positive cases and number of deaths) for the analysis.

Remarks:

Details of the data are visible in the python program output, which is attached with the report.

2.1 Descriptive Analytics for Dataset-1(COVID-19 vaccinations):

As a part of the Descriptive analytics mean, standard deviation, minimum and maximum values are calculated for the dataset-1.

Descriptive Analytics:

```
In [317]: dfUSVacc.describe()
```

Out[317]:

	people_fully_vaccinated
count	4.540000e+02
mean	1.385327e+08
std	7.509866e+07
min	5.621000e+03
25%	7.185233e+07
50%	1.689962e+08
75%	1.985548e+08
max	2.165880e+08

Analysis:

- A total of 454 observations of vaccinations data in USA are considered. After loading the raw dataset, data are grouped my month wise and get 16 observations. The data is up to date, and represents total number of fully covid-19 vaccinations in the entire USA.
- High difference between mean and std are noted, which is normal for this dataset. Vaccination is a continuous process and the number of vaccination is increased over the time, which is the reason of this variance.
- The aforementioned cause is also true for the high difference of minimum and maximum value.

2.2 Descriptive Analytics for Dataset-2 (Covid-19 Data):

As a part of the Descriptive analytics mean, standard deviation, minimum and maximum values are calculated for the dataset-2.

Descriptive Analytics:

```
In [358]: dfUSCovid19Data.describe()
```

Out[358]:

	Deaths
count	25.000000
mean	0.733685
std	0.440583
min	0.040000
25%	0.491237
50%	0.549538
75%	0.884212
max	1.917086

Analysis:

- A total of 759 observations of USA covid-19 data are considered. Later, data are grouped my month wise and get total 25 observations. The data is up to date and presents total number of deaths in the entire USA because of Covid-19 infection.
- A mentionable difference between mean and std values is noted. This distance happens because in the dataset, in 2020, the death rate was significantly higher, and after that the death rates gradually get down. In this dataset, such variation is normal and acceptable.
- The aforementioned cause is also true for the difference of minimum and maximum value.

3.1 Data Exploration:

- This part of the project is to collect and analyze initial data. I have selected two datasets, and have performed statistical techniques in both datasets.
- Data are numeric, I performed mathematical calculations in the datasets for the convenience of the analysis.
- I also calculated mean, median, maximum, minimum values of the datasets as part of the descriptive analysis to observe how the data are distributed.
- Graphs are also provided to visualize the correlation of the variables.

3.2 Statistical Techniques and Mathematical Calculations Details of Dataset-1 (COVID-19 vaccinations):

- A dataset containing information of the date wise total number of vaccinations of the entire USA has been loaded.

```
In [336]: import pandas as pd
          import matplotlib.pyplot as plt

          #first download csv file from URL
          #local path of csv file
          USVaccURL="https://raw.githubusercontent.com/owid/covid-19-data/master/public/data/vaccinations/
          #read CSV file to pandas dataframe
          dfUSVacc=pd.read_csv(USVaccURL)
          #print dataframe
          dfUSVacc
```

Out[336]:

	location	date	vaccine	source_url	total_vaccinations	people_vaccinated	people_fully_vaccinated	t
0	United States	2020-12-13	Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	29326	24448	5621	

- The unnecessary columns are removed from the dataset.

```
memory usage: 28.5+ KB

In [341]: #removed unecessary columns (vaccine,source_url)
          dfUSVacc.drop(['location','vaccine','source_url','total_vaccinations','tota

In [342]: #Columns after removed unecessary columns
          dfUSVacc.columns

Out[342]: Index(['date', 'people_fully_vaccinated'], dtype='object')
```

- Data are grouped by month wise.

```
In [346]: #Monthly grouping
          dfUSVacc['date'] = pd.to_datetime(dfUSVacc['date'])
          dfUSVacc = dfUSVacc.sort_values(by='date')
          dfUSVacc=dfUSVacc.groupby(pd.DatetimeIndex(dfUSVacc.date).to_period('M')).nth([-1])
          dfUSVacc.set_index('date', inplace=True)
          #dfUSVacc.to_csv('dfUSVacc.csv')
          #dfUSVacc

In [347]: dfUSVacc
```

Out[347]:

date	people_fully_vaccinated
2020-12-31	40563
2021-01-31	7348534
2021-02-28	29856080
2021-03-31	64151041

3.3 Statistical Techniques and Mathematical Calculations Details of Dataset2 (Covid-19 Data):

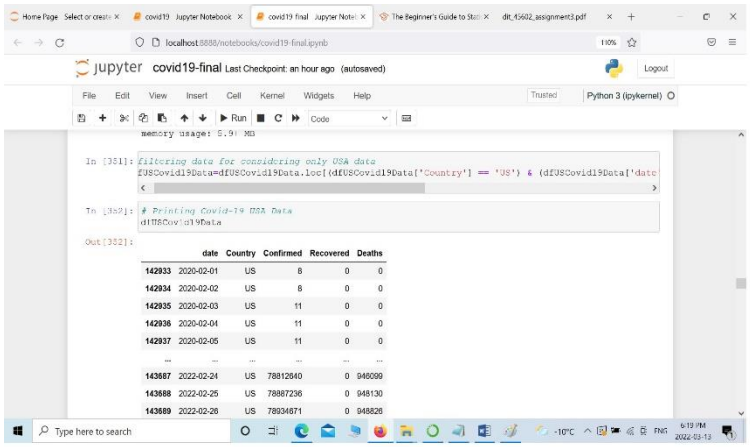
- This dataset containing information of the number of Covid-19 positive cases and deaths of the many countries has been loaded.

```
In [348]: #load covid19 death,confirmed and recovered data
urlCovid19='https://raw.githubusercontent.com/datasets/covid-19/master/data/countries-aggregated
dfUSCovid19Data=pd.read_csv(urlCovid19)
dfUSCovid19Data.rename(columns={'Date': 'date'}, inplace=True)
# Print Initial dataset of covid-19
dfUSCovid19Data
```

Out[348]:

	date	Country	Confirmed	Recovered	Deaths
0	2020-01-22	Afghanistan	0	0	0
1	2020-01-23	Afghanistan	0	0	0
2	2020-01-24	Afghanistan	0	0	0
3	2020-01-25	Afghanistan	0	0	0
4	2020-01-26	Afghanistan	0	0	0

- Later, only the rows of USA has extracted from the dataset and unnecessary columns are removed.



- The deaths percentage has been calculated by dividing number of deaths and the number of confirmed positive Covid-cases. Data are grouped by month wise.

```
In [354]: #removed unnecessary columns, calculating death rate, and grouping
dfUSCovid19Data.drop(['Recovered'],axis=1,inplace=True)
dfUSCovid19Data['Deaths'] =  (dfUSCovid19Data['Deaths']/dfUSCovid19Data['Confirmed'])*1
dfUSCovid19Data['date'] = pd.to_datetime(dfUSCovid19Data['date'])
dfUSCovid19Data=dfUSCovid19Data.groupby(pd.Grouper(key='date', axis=0, freq='M')).sum()
```

3.4 Data Quality, Variables and Correlations:

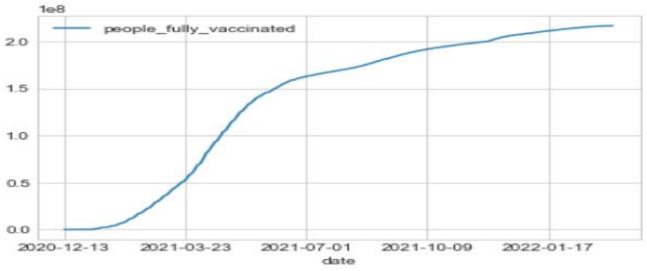
Data Sampling: Numbers of data that are required to justify the hypothesis are available in the datasets. These two datasets represent the updated number of fully vaccinated people and percentage of deaths because of Covid-19 in the USA. Fortunately there are no missing data in the two datasets.

Variables: Variables of the datasets has been selected very carefully to serve the purpose of the project. From the Vaccination dataset 'date' and 'people_fully_vaccinated' variables are selected. From the Covid-19 dataset 'date' and 'Deaths' (Covid-19 infected) variables are selected. These variable are relevant and significantly important to justify the efficacy of the Covid-19 vaccine.

Correlations of Variables: Variables of these two datasets are strongly co-related. In the first dataset (Vaccination), it has been noted that with the progress of time, the number of vaccination is increased in USA.

Graph- Number of Fully Vaccinated People with Time:

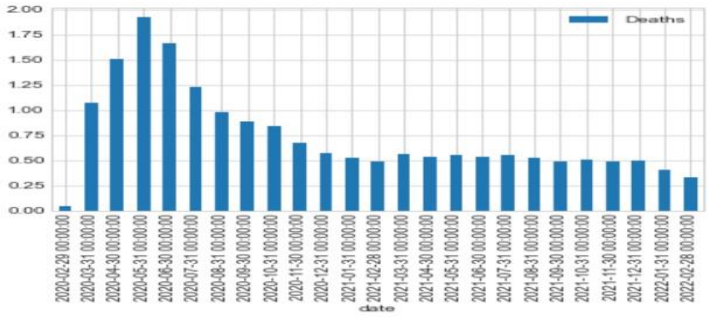
```
In [428]: plt.style.use('seaborn-whitegrid')
          dfUSVacc.plot.line(x='date', y=['people_fully_vaccinated'])
Out[428]: <AxesSubplot:xlabel='date'>
```



Whereas, in the second dataset (Covid-19), it has been observed that at first the death rate became higher, and gradually has been decreased with time.

Graph-Date Rate of Covid-19 Infected People with Time:

```
In [447]: plt.style.use('seaborn-whitegrid')
          dfUSCovid19Data.plot.bar()
Out[447]: <AxesSubplot:xlabel='date'>
```



Based on the analysis, it can be assumed that with the increase of vaccination, the death rate of Covid-19 infected people get down.

4. Python Code:

In [421]:
```
import pandas as pd
import matplotlib.pyplot as plt

#first download csv file from URL
#local path of csv file
USVaccURL="https://raw.githubusercontent.com/owid/covid-19-data/master/pul
#read CSV file to pandas dataframe
dfUSVacc=pd.read_csv(USVaccURL)
#print dataframe
dfUSVacc
```

Out[421]:

	location	date	vaccine	source_url	total_vaccinations	people_vaccina
0	United States	2020-12-13	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	29326	24
1	United States	2020-12-14	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	33886	28
2	United States	2020-12-15	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	83579	76
3	United States	2020-12-16	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	243356	230
4	United States	2020-12-17	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	515783	495
...	...	...	...	...	...	
449	United States	2022-03-07	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	556258145	254356
450	United States	2022-03-08	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	556451963	254407
451	United States	2022-03-09	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	556631018	254455
452	United States	2022-03-10	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	556756401	254486
453	United States	2022-03-11	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	556777608	254492

454 rows × 8 columns

In [422]:
```
dfUSVacc.columns
```

Out[422]:

```
Index(['location', 'date', 'vaccine', 'source_url', 'total_vaccination
s',
       'people_vaccinated', 'people_fully_vaccinated', 'total_boosters
```

In [423]:
```
#Inspect data

dfUSVacc.head(10)
```

Out[423]:

	location	date	vaccine	source_url	total_vaccinations	people_vaccinated
0	United States	2020-12-13	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	29326	24448
1	United States	2020-12-14	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	33886	28849
2	United States	2020-12-15	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	83579	76213
3	United States	2020-12-16	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	243356	230601
4	United States	2020-12-17	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	515783	495911
5	United States	2020-12-18	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	931898	903477
6	United States	2020-12-19	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	1113670	1081326
7	United States	2020-12-20	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	1218868	1184589
8	United States	2020-12-21	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	1600537	1559731
9	United States	2020-12-22	Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	2047964	1998672

In [424]:
```
dfUSVacc.tail(10)
```

Out[424]:

	location	date	vaccine	source_url	total_vaccinations	people_vaccina
444	United States	2022-03-02	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	555288308	254093
445	United States	2022-03-03	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov/Vaccinations/COVID-19-Vac...	555520897	254154

	location	date	vaccine	source_url	total_vaccinations	people_vaccina
446	United States	2022-03-04	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	555812647	254228
447	United States	2022-03-05	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	555981876	254276
448	United States	2022-03-06	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	556064969	254302
449	United States	2022-03-07	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	556258145	254356
450	United States	2022-03-08	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	556451963	254407
451	United States	2022-03-09	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac...	556631018	254455
452	United States	2022-03-10	Johnson&Johnson, Moderna, Pfizer/BioNTech	https://data.cdc.gov /Vaccinations /COVID-19-Vac	556756401	254486

In [425]:
```
#to get information about column of dataset
dfUSVacc.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 454 entries, 0 to 453
Data columns (total 8 columns):
 #   Column                  Non-Null Count  Dtype 
---  ------                  --------------  ----- 
 0   location                454 non-null    object
 1   date                    454 non-null    object
 2   vaccine                 454 non-null    object
 3   source_url              454 non-null    object
 4   total_vaccinations      454 non-null    int64 
 5   people_vaccinated       454 non-null    int64 
 6   people_fully_vaccinated 454 non-null    int64 
 7   total_boosters          454 non-null    int64 
dtypes: int64(4), object(4)
memory usage: 28.5+ KB
```

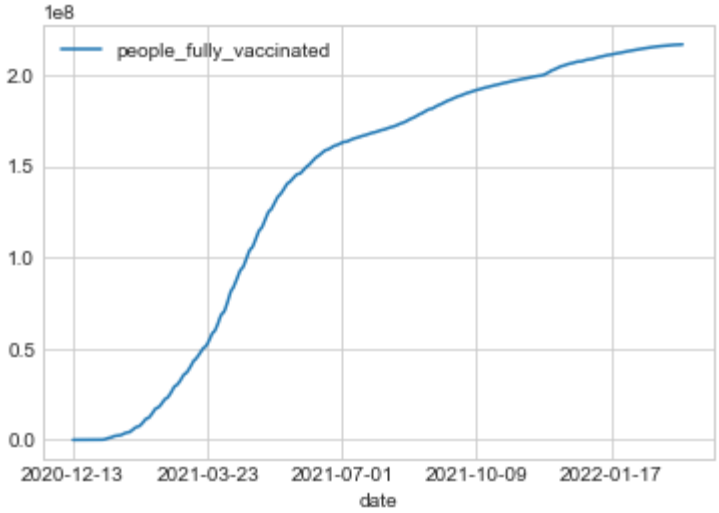
In [426]:
```
#removed unecessary columns (vaccine,source_url)
dfUSVacc.drop(['location','vaccine','source_url','total_vaccinations','to
```

In [427]:
```
#Columns after removed unecessary columns
dfUSVacc.columns
```

Out[427]:
```
Index(['date', 'people_fully_vaccinated'], dtype='object')
```

In [428]:
```
plt.style.use('seaborn-whitegrid')
dfUSVacc.plot.line(x='date', y=['people_fully_vaccinated'])
```

Out[428]:
```
<AxesSubplot:xlabel='date'>
```



In [429]:
```
#Columns information after removed unecessary columns
dfUSVacc.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 454 entries, 0 to 453
Data columns (total 2 columns):
 #   Column                   Non-Null Count  Dtype 
---  ------                   --------------  ----- 
 0   date                     454 non-null    object
 1   people_fully_vaccinated  454 non-null    int64 
dtypes: int64(1), object(1)
memory usage: 7.2+ KB
```

In [430]:
```
dfUSVacc
```

Out[430]:

	date	people_fully_vaccinated
0	2020-12-13	5621
1	2020-12-14	5740
2	2020-12-15	6000
3	2020-12-16	6472
4	2020-12-17	7216
...	...	...
449	2022-03-07	216443742
450	2022-03-08	216496541
451	2022-03-09	216546240
452	2022-03-10	216581385
453	2022-03-11	216587984

454 rows × 2 columns

In [431]:
```
dfUSVacc.describe()
```

Out[431]:

	people_fully_vaccinated
count	4.540000e+02
mean	1.385327e+08
std	7.509866e+07
min	5.621000e+03
25%	7.185233e+07
50%	1.689962e+08
75%	1.985548e+08
max	2.165880e+08

In [432]:
```
#Monthly grouping
dfUSVacc['date'] = pd.to_datetime(dfUSVacc['date'])
dfUSVacc = dfUSVacc.sort_values(by='date')
dfUSVacc=dfUSVacc.groupby(pd.DatetimeIndex(dfUSVacc.date).to_period('M'))
dfUSVacc.set_index('date', inplace=True)
#dfUSVacc.to_csv('dfUSVacc.csv')
#dfUSVacc
```

In [433]:
```
dfUSVacc
```

Out[433]:

date	people_fully_vaccinated
2020-12-31	40563
2021-01-31	7348534
2021-02-28	29856080
2021-03-31	64151041
2021-04-30	114113909
2021-05-31	145930115
2021-06-30	162437860
2021-07-31	169848427
2021-08-31	179605883
2021-09-30	189456150
2021-10-31	195708071
2021-11-30	200716297
2021-12-31	208368699
2022-01-31	213083575

date	people_fully_vaccinated

In [434]:
```
#load covid19 death,confirmed and recovered data
urlCovid19='https://raw.githubusercontent.com/datasets/covid-19/master/da
dfUSCovid19Data=pd.read_csv(urlCovid19)
dfUSCovid19Data.rename(columns={'Date': 'date'}, inplace=True)
# Print Initial dataset of covid-19
dfUSCovid19Data
```

Out[434]:

	date	Country	Confirmed	Recovered	Deaths
0	2020-01-22	Afghanistan	0	0	0
1	2020-01-23	Afghanistan	0	0	0
2	2020-01-24	Afghanistan	0	0	0
3	2020-01-25	Afghanistan	0	0	0
4	2020-01-26	Afghanistan	0	0	0
...	...	...	...	...	...
154633	2022-03-08	Zimbabwe	240343	0	5400
154634	2022-03-09	Zimbabwe	240343	0	5400
154635	2022-03-10	Zimbabwe	241548	0	5408
154636	2022-03-11	Zimbabwe	241548	0	5408
154637	2022-03-12	Zimbabwe	242069	0	5412

154638 rows × 5 columns

In [435]:
```
#Initial total columns of dfUSCovid19Data dataset
dfUSCovid19Data.columns
```

Out[435]:
```
Index(['date', 'Country', 'Confirmed', 'Recovered', 'Deaths'], dtype='
object')
```

In [436]:
```
#Initial columns info of dfUSCovid19Data dataset
dfUSCovid19Data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 154638 entries, 0 to 154637
Data columns (total 5 columns):
 #   Column     Non-Null Count   Dtype 
---  ------     --------------   ----- 
 0   date       154638 non-null  object
 1   Country    154638 non-null  object
 2   Confirmed  154638 non-null  int64 
 3   Recovered  154638 non-null  int64 
 4   Deaths     154638 non-null  int64 
dtypes: int64(3), object(2)
memory usage: 5.9+ MB
```

In [437]:
```
#filtering data for considering only USA data
dfUSCovid19Data=dfUSCovid19Data.loc[(dfUSCovid19Data['Country'] == 'US')
```

In [438]:
```
# Printing Covid-19 USA Data
dfUSCovid19Data
```

Out[438]:

	date	Country	Confirmed	Recovered	Deaths
142933	2020-02-01	US	8	0	0
142934	2020-02-02	US	8	0	0
142935	2020-02-03	US	11	0	0
142936	2020-02-04	US	11	0	0
142937	2020-02-05	US	11	0	0
...	...	...	...	...	...
143687	2022-02-24	US	78812640	0	946099
143688	2022-02-25	US	78887236	0	948130
143689	2022-02-26	US	78934671	0	948826
143690	2022-02-27	US	78950518	0	949018
143691	2022-02-28	US	79047371	0	951114

759 rows × 5 columns

In [439]:
```
dfUSCovid19Data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 759 entries, 142933 to 143691
Data columns (total 5 columns):
 #   Column     Non-Null Count  Dtype 
---  ------     --------------  ----- 
 0   date       759 non-null    object
 1   Country    759 non-null    object
 2   Confirmed  759 non-null    int64 
 3   Recovered  759 non-null    int64 
 4   Deaths     759 non-null    int64 
dtypes: int64(3), object(2)
memory usage: 35.6+ KB
```

In [440]:
```
#removed unnecessary columns, calculating death rate, and grouping
dfUSCovid19Data.drop(['Recovered'],axis=1,inplace=True)
dfUSCovid19Data['Deaths'] =  (dfUSCovid19Data['Deaths']/dfUSCovid19Data['
dfUSCovid19Data['date'] = pd.to_datetime(dfUSCovid19Data['date'])
dfUSCovid19Data=dfUSCovid19Data.groupby(pd.Grouper(key='date', axis=0, fr
```

```
C:\Users\Taslima Akter\anaconda3\lib\site-packages\pandas\core\frame.p
y:4906: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas
-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
(https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html
#returning-a-view-versus-a-copy)
  return super().drop(
C:\Users\TASLIM~1\AppData\Local\Temp/ipykernel_19284/1664610843.py:3:
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
(https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html
#returning-a-view-versus-a-copy)
  dfUSCovid19Data['Deaths'] =  (dfUSCovid19Data['Deaths']/dfUSCovid19D
ata['Confirmed'])*1
C:\Users\TASLIM~1\AppData\Local\Temp/ipykernel_19284/1664610843.py:4:
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
```

In [441]:
```
# Printing covid-19 Data of USA after removing unnecessary columns and gr
dfUSCovid19Data
```

Out[441]:

date	Confirmed	Deaths
2020-02-29	402	0.040000
2020-03-31	1121455	1.073644
2020-04-30	19835424	1.508744
2020-05-31	45294659	1.917086
2020-06-30	64822529	1.663059
2020-07-31	111086834	1.225709
2020-08-31	166531654	0.981105
2020-09-30	199608857	0.884212
2020-10-31	251226672	0.839544
2020-11-30	338160262	0.671164
2020-12-31	527988498	0.570083
2021-01-31	733787758	0.524889
2021-02-28	776848931	0.490191
2021-03-31	919661679	0.559992
2021-04-30	947668934	0.536053

date	Confirmed	Deaths
2021-05-31	1023439204	0.549538
2021-06-30	1007947426	0.535629
2021-07-31	1061524357	0.550731
2021-08-31	1151033303	0.521806
2021-09-30	1250238382	0.482108
2021-10-31	1392850378	0.500566
2021-11-30	1419741886	0.485748
2021-12-31	1578107825	0.491237

In [442]:
```
#before vaccination in the year 2020 , death rate
dfUSCovid19Data.drop(['Confirmed'],axis=1,inplace=True)
print(dfUSCovid19Data)
#dfUSCovid19Data.to_csv('dfUSCovid19Data.csv')
#dfUSCovid19Data.rename(columns={'Confirmed': 'covid_postive'}, inplace=T
```

```
              Deaths
date
2020-02-29  0.040000
2020-03-31  1.073644
2020-04-30  1.508744
2020-05-31  1.917086
2020-06-30  1.663059
2020-07-31  1.225709
2020-08-31  0.981105
2020-09-30  0.884212
2020-10-31  0.839544
2020-11-30  0.671164
2020-12-31  0.570083
2021-01-31  0.524889
2021-02-28  0.490191
2021-03-31  0.559992
2021-04-30  0.536053
2021-05-31  0.549538
2021-06-30  0.535629
2021-07-31  0.550731
2021-08-31  0.521806
2021-09-30  0.482108
2021-10-31  0.500566
2021-11-30  0.485748
2021-12-31  0.491237
2022-01-31  0.406118
2022-02-28  0.333173
```

In [443]:
```
dfUSCovid19Data.describe()
```

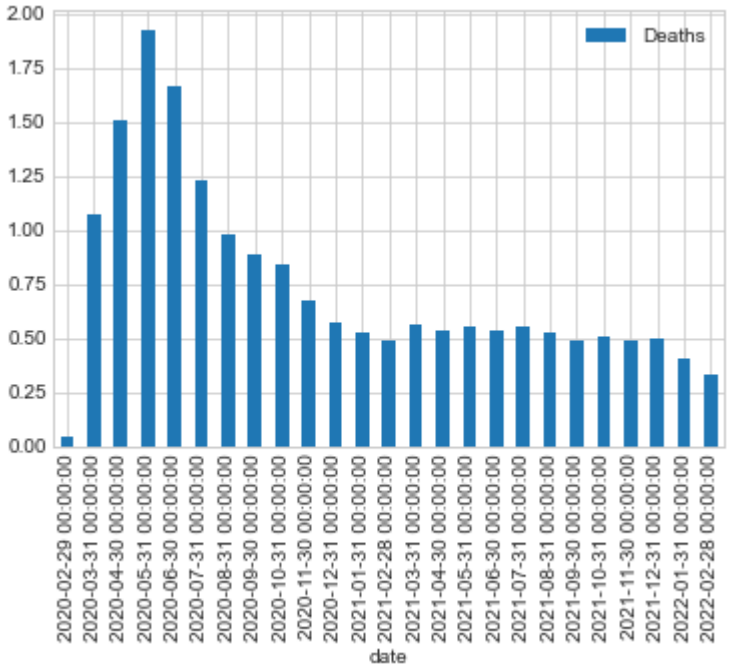
Out[443]:

	Deaths
count	25.000000

	Deaths
mean	0.733685
std	0.440583
min	0.040000
25%	0.491237
50%	0.549538
75%	0.884212

In [447]:
```
plt.style.use('seaborn-whitegrid')
dfUSCovid19Data.plot.bar()
```

Out[447]: <AxesSubplot:xlabel='date'>



Future Assumptions:

The purpose of this project is to measure the effectiveness of the Covid-19 vaccine in the USA by comparing the death ratio of USA citizens before and after fully vaccination. To get the final output in further part of the project, I will merged these datasets, and justify the hypothesis.

Limitations of the Analysis:

Because of the shortage of time the analysis has been made to some variables (death rates of Covid-19 infected people and number of vaccination) to measure the effectiveness of the Covid-19 vaccine in the USA. Some other variables, such as the rate of hospitalization of Covid-19 infected people, which are also related to prove the hypothesis are not considered.

Reference:

- Class Lecture-4.
- Examples of Assignment provided in the class.
- Lab Materials-3 and 4 provided in the class.
- https://raw.githubusercontent.com/owid/covid-19-data/master/public/data/vaccinations/country_data/United%20States.csv
- https://raw.githubusercontent.com/datasets/covid-19/master/data/countries-aggregated.csv
- https://www.scribbr.com/category/statistics