python project

May 13, 2023

[2]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib as mp
```

[4]:
```
dm = pd.read_excel(r'C:\Users\pc\Documents\energy.xlsx')
dm
```

[4]:

	Country	Energy_type	Year	\
0	World	all_energy_types	1980	
1	World	coal	1980	
2	World	natural_gas	1980	
3	World	petroleum_n_other_liquids	1980	
4	World	nuclear	1980	
…	…	…	…	
55435	Zimbabwe	coal	2019	
55436	Zimbabwe	natural_gas	2019	
55437	Zimbabwe	petroleum_n_other_liquids	2019	
55438	Zimbabwe	nuclear	2019	
55439	Zimbabwe	renewables_n_other	2019	

	Energy_consumption(quad Btu)	Energy_production(quad Btu)	\
0	292.899790	296.337228	
1	78.656134	80.114194	
2	53.865223	54.761046	
3	132.064019	133.111109	
4	7.575700	7.575700	
…	…	…	
55435	0.045064	0.075963	
55436	0.000000	0.000000	
55437	0.055498	0.000000	
55438	NaN	NaN	
55439	0.068089	0.067499	

	GDP(Billions)	Population	Energy_intensity_per_capita(MMBtu/person)	\
0	27770.910281	4.298127e+06	68.145921	
1	27770.910281	4.298127e+06	68.145921	
2	27770.910281	4.298127e+06	68.145921	

```
3       27770.910281  4.298127e+06                                  68.145921
4       27770.910281  4.298127e+06                                  68.145921
…                ⋯             ⋯                                          …
55435      37.620400  1.465420e+04                                  11.508701
55436      37.620400  1.465420e+04                                  11.508701
55437      37.620400  1.465420e+04                                  11.508701
55438      37.620400  1.465420e+04                                  11.508701
55439      37.620400  1.465420e+04                                  11.508701

       Energy_intensity_by_GDP(1000 Btu/GDP)  CO2_emission(MMtonnes)
0                                  10.547000             4946.627130
1                                  10.547000             1409.790188
2                                  10.547000             1081.593377
3                                  10.547000             2455.243565
4                                  10.547000                0.000000
…                                        …                     …
55435                               4.482962                4.586869
55436                               4.482962                0.000000
55437                               4.482962                4.377890
55438                               4.482962                0.000000
55439                               4.482962                0.000000

[55440 rows x 10 columns]
```

[5]:
```
dm . dropna()
```

[5]:
```
        Country                Energy_type  Year  \
0         World           all_energy_types  1980
1         World                       coal  1980
2         World                natural_gas  1980
3         World  petroleum_n_other_liquids  1980
4         World                    nuclear  1980
…         …                          …    …
55434  Zimbabwe           all_energy_types  2019
55435  Zimbabwe                       coal  2019
55436  Zimbabwe                natural_gas  2019
55437  Zimbabwe  petroleum_n_other_liquids  2019
55439  Zimbabwe         renewables_n_other  2019

       Energy_consumption(quad Btu)  Energy_production(quad Btu)  \
0                        292.899790                   296.337228
1                         78.656134                    80.114194
2                         53.865223                    54.761046
3                        132.064019                   133.111109
4                          7.575700                     7.575700
…                                ⋯                            …
55434                      0.168651                     0.143462
```

```
55435                    0.045064                    0.075963
55436                    0.000000                    0.000000
55437                    0.055498                    0.000000
55439                    0.068089                    0.067499

       GDP(Billions)    Population  Energy_intensity_per_capita(MMBtu/person)  \
0        27770.910281  4.298127e+06                                   68.145921
1        27770.910281  4.298127e+06                                   68.145921
2        27770.910281  4.298127e+06                                   68.145921
3        27770.910281  4.298127e+06                                   68.145921
4        27770.910281  4.298127e+06                                   68.145921
…                 …             …                                           …
55434       37.620400  1.465420e+04                                   11.508701
55435       37.620400  1.465420e+04                                   11.508701
55436       37.620400  1.465420e+04                                   11.508701
55437       37.620400  1.465420e+04                                   11.508701
55439       37.620400  1.465420e+04                                   11.508701

       Energy_intensity_by_GDP(1000 Btu/GDP)  CO2_emission(MMtonnes)
0                                  10.547000             4946.627130
1                                  10.547000             1409.790188
2                                  10.547000             1081.593377
3                                  10.547000             2455.243565
4                                  10.547000                0.000000
…                                        …                        …
55434                               4.482962                8.964759
55435                               4.482962                4.586869
55436                               4.482962                0.000000
55437                               4.482962                4.377890
55439                               4.482962                0.000000

[33305 rows x 10 columns]
```

[7]:
```
dm . sample
```

[7]:
```
<bound method NDFrame.sample of         Country               Energy_type  Year
\
0         World           all_energy_types  1980
1         World                       coal  1980
2         World                natural_gas  1980
3         World  petroleum_n_other_liquids  1980
4         World                    nuclear  1980
…         …                        …   …
55435  Zimbabwe                       coal  2019
55436  Zimbabwe                natural_gas  2019
55437  Zimbabwe  petroleum_n_other_liquids  2019
55438  Zimbabwe                    nuclear  2019
```

```
55439  Zimbabwe         renewables_n_other  2019

       Energy_consumption(quad Btu)  Energy_production(quad Btu)  \
0                        292.899790                   296.337228
1                         78.656134                    80.114194
2                         53.865223                    54.761046
3                        132.064019                   133.111109
4                          7.575700                     7.575700
…                                …                            …
55435                      0.045064                     0.075963
55436                      0.000000                     0.000000
55437                      0.055498                     0.000000
55438                           NaN                          NaN
55439                      0.068089                     0.067499

       GDP(Billions)    Population  Energy_intensity_per_capita(MMBtu/person)  \
0       27770.910281  4.298127e+06                                   68.145921
1       27770.910281  4.298127e+06                                   68.145921
2       27770.910281  4.298127e+06                                   68.145921
3       27770.910281  4.298127e+06                                   68.145921
4       27770.910281  4.298127e+06                                   68.145921
…                ...           …                                            …
55435      37.620400  1.465420e+04                                   11.508701
55436      37.620400  1.465420e+04                                   11.508701
55437      37.620400  1.465420e+04                                   11.508701
55438      37.620400  1.465420e+04                                   11.508701
55439      37.620400  1.465420e+04                                   11.508701

       Energy_intensity_by_GDP(1000 Btu/GDP)  CO2_emission(MMtonnes)
0                                  10.547000             4946.627130
1                                  10.547000             1409.790188
2                                  10.547000             1081.593377
3                                  10.547000             2455.243565
4                                  10.547000                0.000000
…                                        …                        …
55435                               4.482962                4.586869
55436                               4.482962                0.000000
55437                               4.482962                4.377890
55438                               4.482962                0.000000
55439                               4.482962                0.000000

[55440 rows x 10 columns]>
```

[8]:
```
dm.head(10)
```

[8]:
```
       Country               Energy_type  Year  Energy_consumption(quad Btu)  \
0        World          all_energy_types  1980                    292.899790
```

1	World	coal	1980		78.656134
2	World	natural_gas	1980		53.865223
3	World	petroleum_n_other_liquids	1980		132.064019
4	World	nuclear	1980		7.575700
5	World	renewables_n_other	1980		20.702344
6	Afghanistan	all_energy_types	1980		0.026583
7	Afghanistan	coal	1980		0.002479
8	Afghanistan	natural_gas	1980		0.002094
9	Afghanistan	petroleum_n_other_liquids	1980		0.014624

	Energy_production(quad Btu)	GDP(Billions)	Population	\
0	296.337228	27770.910281	4.298127e+06	
1	80.114194	27770.910281	4.298127e+06	
2	54.761046	27770.910281	4.298127e+06	
3	133.111109	27770.910281	4.298127e+06	
4	7.575700	27770.910281	4.298127e+06	
5	20.775178	27770.910281	4.298127e+06	
6	0.072561	NaN	1.335650e+04	
7	0.002355	NaN	1.335650e+04	
8	0.062820	NaN	1.335650e+04	
9	0.000000	NaN	1.335650e+04	

	Energy_intensity_per_capita(MMBtu/person)	\
0	68.145921	
1	68.145921	
2	68.145921	
3	68.145921	
4	68.145921	
5	68.145921	
6	1.990283	
7	1.990283	
8	1.990283	
9	1.990283	

	Energy_intensity_by_GDP(1000 Btu/GDP)	CO2_emission(MMtonnes)
0	10.547	4946.627130
1	10.547	1409.790188
2	10.547	1081.593377
3	10.547	2455.243565
4	10.547	0.000000
5	10.547	0.000000
6	0.000	NaN
7	0.000	NaN
8	0.000	NaN
9	0.000	NaN

[10]:
```
dm = pd.DataFrame(np.random.randn(5,4))
dm
```

[10]:

	0	1	2	3
0	0.417137	-1.796944	0.230805	1.337527
1	-0.280385	0.363421	-2.380827	2.568093
2	1.046933	0.919480	0.790992	1.069437
3	-0.057376	0.243298	-1.796940	-1.711863
4	-0.144673	-0.532048	-1.293672	1.136448

[14]:
```
dm.describe()
```

[14]:

	Year	Energy_consumption(quad Btu)	Energy_production(quad Btu)	\
count	55440.0000	44287.000000	4.428900e+04	
mean	1999.5000	1.537811	1.532700e+00	
std	11.5435	15.456596	1.530356e+01	
min	1980.0000	-0.163438	-1.000000e-39	
25%	1989.7500	0.000000	0.000000e+00	
50%	1999.5000	0.018381	5.121971e-04	
75%	2009.2500	0.209422	1.125410e-01	
max	2019.0000	601.040490	6.115090e+02	

	GDP(Billions)	Population	Energy_intensity_per_capita(MMBtu/person)	\
count	40026.000000	4.601400e+04	50358.000000	
mean	827.144126	6.263020e+04	71.898914	
std	5981.703144	4.562088e+05	113.728738	
min	0.124958	1.147100e+01	0.000000	
25%	9.737780	1.141950e+03	3.799939	
50%	47.757100	6.157680e+03	29.779260	
75%	263.687100	2.004290e+04	95.523627	
max	127690.247059	7.714631e+06	1139.320598	

	Energy_intensity_by_GDP(1000 Btu/GDP)	CO2_emission(MMtonnes)
count	50358.000000	51614.000000
mean	3.695104	78.800082
std	4.590735	902.221463
min	0.000000	-0.005130
25%	0.899446	0.000000
50%	2.987593	0.000000
75%	4.969454	4.318822
max	166.913605	35584.933498