Question:-

• Apply advanced statistical techniques to a dataset, presenting findings and insights.

Importing the libraries.

```
#Importing the numpy library.
import numpy as np


#Importing pandas library.
import pandas as pd
```

Uploading a dataset.

```
#Uploading a dataset
User = pd.read_excel("/content/covid19-nigeria-dataset.xlsx")


# Displaying a dataset
print(User)
```

```
            Date Location  Suspected Cases  Nr. Of New Cases  \
0   2020-02-27     Ogun                0                 1
1   2020-02-27    Lagos                0                 0
2   2020-03-01     Ogun                0                 0
3   2020-03-01    Lagos                0                 0
4   2020-03-02     Ogun                0                 0
..         ...      ...              ...               ...
166 2020-03-25      Oyo                3                 0
167 2020-03-25  Plateau                4                 0
168 2020-03-25   Rivers                7                 1
169 2020-03-25   Sokoto                1                 0
170 2020-03-25     Yobe                1                 0

     Total Confirmed Cases                                         Source  \
0                        1  https://ncdc.gov.ng/themes/common/files/sitrep...
1                        0  https://ncdc.gov.ng/themes/common/files/sitrep...
2                        1  https://ncdc.gov.ng/themes/common/files/sitrep...
3                        0  https://ncdc.gov.ng/themes/common/files/sitrep...
4                        1  https://ncdc.gov.ng/themes/common/files/sitrep...
..                     ...                                               ...
166                      1  https://ncdc.gov.ng/themes/common/files/sitrep...
167                      0  https://ncdc.gov.ng/themes/common/files/sitrep...
168                      1  https://ncdc.gov.ng/themes/common/files/sitrep...
169                      0  https://ncdc.gov.ng/themes/common/files/sitrep...
170                      0  https://ncdc.gov.ng/themes/common/files/sitrep...

     Deaths  Recovered  Contacts Under Follow-up  \
0         0          0                        19
1         0          0                         6
2         0          0                        34
3         0          0                        19
4         0          0                        35
..      ...        ...                       ...
```

```
166       0          0                       0
167       0          0                       0
168       0          0                       0
169       0          0                       0
170       0          0                       0

     HCW Contacts Under Follow-up  Total Contacts Under Follow-Up  \
0                             5.0                            24.0
1                             0.0                             6.0
2                             5.0                            39.0
3                             0.0                            19.0
4                             5.0                            40.0
..                            ...                             ...
166                           NaN                             NaN
167                           NaN                             NaN
168                           NaN                             NaN
169                           NaN                             NaN
170                           NaN                             NaN

     Cumulative Contacts Under Follow-up  Total Suspected Cases Unnamed: 13
0                                   24.0                    NaN         NaN
1                                   30.0                    NaN         NaN
2                                   39.0                    NaN         NaN
3                                   58.0                    NaN         NaN
4                                   40.0                    NaN         NaN
```

```
# Checking the mean
mean=np.mean(User)
```

```
/usr/local/lib/python3.10/dist-packages/numpy/core/fromnumeric.py:3502: FutureWarning: In a fu
  return mean(axis=axis, dtype=dtype, out=out, **kwargs)
/usr/local/lib/python3.10/dist-packages/numpy/core/fromnumeric.py:3502: FutureWarning: DataFra
  return mean(axis=axis, dtype=dtype, out=out, **kwargs)
/usr/local/lib/python3.10/dist-packages/numpy/core/fromnumeric.py:3502: FutureWarning: The def
  return mean(axis=axis, dtype=dtype, out=out, **kwargs)
```

```
# Printing the mean
mean
```

```
Suspected Cases                        6.807018
Nr. Of New Cases                       0.304094
Total Confirmed Cases                  1.000000
Deaths                                 0.005848
Recovered                              0.076023
Contacts Under Follow-up               5.584795
HCW Contacts Under Follow-up           2.500000
Total Contacts Under Follow-Up        27.666667
Cumulative Contacts Under Follow-up   46.250000
Total Suspected Cases                       NaN
dtype: float64
```

```
# Standard deviation
std_dev=np.std(User)
```

```
/usr/local/lib/python3.10/dist-packages/numpy/core/fromnumeric.py:3643: FutureWarning: The def
  return std(axis=axis, dtype=dtype, out=out, ddof=ddof, **kwargs)
```

```
# Printing standard deviation
print(std_dev)
```

```
Date                                6 days 23:24:20.984619272
Suspected Cases                                     15.606385
```

```
Nr. Of New Cases                                1.30269
Total Confirmed Cases                          3.861642
Deaths                                         0.076248
Recovered                                      0.324548
Contacts Under Follow-up                       7.927124
HCW Contacts Under Follow-up                        2.5
Total Contacts Under Follow-Up                11.078006
Cumulative Contacts Under Follow-up           12.833063
Total Suspected Cases                               NaN
dtype: object
```

```
# Variance
variance=np.var(User)
```

```
/usr/local/lib/python3.10/dist-packages/numpy/core/fromnumeric.py:3785: FutureWarning: The defa
  return var(axis=axis, dtype=dtype, out=out, ddof=ddof, **kwargs)
```

```
# Displaying the variance of the dataset
print(variance)
```

```
Suspected Cases                       243.559249
Nr. Of New Cases                        1.697001
Total Confirmed Cases                  14.912281
Deaths                                  0.005814
Recovered                               0.105332
Contacts Under Follow-up               62.839301
HCW Contacts Under Follow-up            6.250000
Total Contacts Under Follow-Up        122.722222
Cumulative Contacts Under Follow-up   164.687500
Total Suspected Cases                        NaN
dtype: float64
```

Correlation matrix

```
corr_matrix = User.corr()
corr_matrix
```

```
<ipython-input-56-714b1692f64c>:1: FutureWarning: The default value of numeric_only in DataFra
  corr_matrix = User.corr()
```

	Suspected Cases	Nr. Of New Cases	Total Confirmed Cases	Deaths	Recovered	Contacts Under Follow-up	HCW Contacts Under Follow-up	Total Contacts Under Follow-Up	Cumu Co Fol
Suspected Cases	1.000000	0.737538	0.877393	0.222098	-0.039823	-0.089374	NaN	NaN	
Nr. Of New Cases	0.737538	1.000000	0.780034	0.217598	-0.027017	-0.086310	0.301511	-0.099796	-0
Total Confirmed Cases	0.877393	0.780034	1.000000	0.139028	0.079323	-0.080235	1.000000	0.857555	-0
Deaths	0.222098	0.217598	0.139028	1.000000	-0.017966	-0.054034	NaN	NaN	
Recovered	-0.039823	-0.027017	0.079323	-0.017966	1.000000	-0.080926	NaN	NaN	
Contacts Under Follow-up	-0.089374	-0.086310	-0.080235	-0.054034	-0.080926	1.000000	0.775520	0.989799	-0
HCW Contacts Under Follow-up	NaN	0.301511	1.000000	NaN	NaN	0.775520	1.000000	0.857555	-0
Total Contacts Under Follow-Up	NaN	-0.099796	0.857555	NaN	NaN	0.989799	0.857555	1.000000	-0
Cumulative Contacts Under Follow-up	NaN	-0.522761	-0.707807	NaN	NaN	-0.129136	-0.707807	-0.264951	1
Total Suspected Cases	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	