Importing libraries

In [1]:
```
import pandas as pd
import numpy as np
from numpy import cov
from scipy.stats import spearmanr
from scipy.stats import pearsonr
```

In [2]:
```
df=pd.read_csv(r"C:\Users\user\Desktop\Ash\Datasets\8_BreastCancerPrediction.csv")
df
```

Out[2]:

	id	diagnosis	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_mean	compactness_mean	concavity_m
0	842302	M	17.99	10.38	122.80	1001.0	0.11840	0.27760	0.3(
1	842517	M	20.57	17.77	132.90	1326.0	0.08474	0.07864	0.0{
2	84300903	M	19.69	21.25	130.00	1203.0	0.10960	0.15990	0.1{
3	84348301	M	11.42	20.38	77.58	386.1	0.14250	0.28390	0.2(
4	84358402	M	20.29	14.34	135.10	1297.0	0.10030	0.13280	0.1{
...	...	...	...	...	...	...	...	...	
564	926424	M	21.56	22.39	142.00	1479.0	0.11100	0.11590	0.2(
565	926682	M	20.13	28.25	131.20	1261.0	0.09780	0.10340	0.1(
566	926954	M	16.60	28.08	108.30	858.1	0.08455	0.10230	0.0{
567	927241	M	20.60	29.33	140.10	1265.0	0.11780	0.27700	0.3{
568	92751	B	7.76	24.54	47.92	181.0	0.05263	0.04362	0.0(

569 rows × 33 columns

Mean

In [3]:
```
print(df.mean())
```

```
id                         3.037183e+07
radius_mean                1.412729e+01
texture_mean               1.928965e+01
perimeter_mean             9.196903e+01
area_mean                  6.548891e+02
smoothness_mean            9.636028e-02
compactness_mean           1.043410e-01
concavity_mean             8.879932e-02
concave points_mean        4.891915e-02
symmetry_mean              1.811619e-01
fractal_dimension_mean     6.279761e-02
radius_se                  4.051721e-01
texture_se                 1.216853e+00
perimeter_se               2.866059e+00
area_se                    4.033708e+01
smoothness_se              7.040979e-03
compactness_se             2.547814e-02
concavity_se               3.189372e-02
concave points_se          1.179614e-02
symmetry_se                2.054230e-02
fractal_dimension_se       3.794904e-03
radius_worst               1.626919e+01
texture_worst              2.567722e+01
perimeter_worst            1.072612e+02
area_worst                 8.805831e+02
smoothness_worst           1.323686e-01
compactness_worst          2.542650e-01
concavity_worst            2.721885e-01
concave points_worst       1.146062e-01
symmetry_worst             2.900756e-01
fractal_dimension_worst    8.394582e-02
Unnamed: 32                         NaN
dtype: float64
```

Median

In [4]:
```
print(df.median())
```

```
id                         906024.000000
radius_mean                    13.370000
texture_mean                   18.840000
perimeter_mean                 86.240000
area_mean                     551.100000
smoothness_mean                 0.095870
compactness_mean                0.092630
concavity_mean                  0.061540
concave points_mean             0.033500
symmetry_mean                   0.179200
fractal_dimension_mean          0.061540
radius_se                       0.324200
texture_se                      1.108000
perimeter_se                    2.287000
area_se                        24.530000
smoothness_se                   0.006380
compactness_se                  0.020450
concavity_se                    0.025890
concave points_se               0.010930
symmetry_se                     0.018730
fractal_dimension_se            0.003187
radius_worst                   14.970000
texture_worst                  25.410000
perimeter_worst                97.660000
area_worst                    686.500000
smoothness_worst                0.131300
compactness_worst               0.211900
concavity_worst                 0.226700
concave points_worst            0.099930
symmetry_worst                  0.282200
fractal_dimension_worst         0.080040
Unnamed: 32                          NaN
dtype: float64
```

Mode

In [5]:
```
print(df.mode())
```

```
            id diagnosis  radius_mean  texture_mean  perimeter_mean  \
0         8670         B        12.34         14.93           82.61
1         8913       NaN          NaN         15.70           87.76
2         8915       NaN          NaN         16.84          134.70
3         9047       NaN          NaN         16.85             NaN
4        85715       NaN          NaN         17.46             NaN
..         ...       ...          ...           ...             ...
564  911157302       NaN          NaN           NaN             NaN
565  911296201       NaN          NaN           NaN             NaN
566  911296202       NaN          NaN           NaN             NaN
567  911320501       NaN          NaN           NaN             NaN
568  911320502       NaN          NaN           NaN             NaN

     area_mean  smoothness_mean  compactness_mean  concavity_mean  \
0        512.2           0.1007            0.1147             0.0
1          NaN              NaN            0.1206             NaN
2          NaN              NaN               NaN             NaN
3          NaN              NaN               NaN             NaN
4          NaN              NaN               NaN             NaN
..         ...              ...               ...             ...
564        NaN              NaN               NaN             NaN
565        NaN              NaN               NaN             NaN
566        NaN              NaN               NaN             NaN
567        NaN              NaN               NaN             NaN
568        NaN              NaN               NaN             NaN

     concave points_mean  ...  texture_worst  perimeter_worst  area_worst  \
0                    0.0  ...          17.70            101.7       284.4
1                    NaN  ...          27.26            105.9       402.8
2                    NaN  ...            NaN            117.7       439.6
3                    NaN  ...            NaN              NaN       458.0
4                    NaN  ...            NaN              NaN       472.4
..                   ...  ...            ...              ...         ...
564                  NaN  ...            NaN              NaN         NaN
565                  NaN  ...            NaN              NaN         NaN
566                  NaN  ...            NaN              NaN         NaN
567                  NaN  ...            NaN              NaN         NaN
568                  NaN  ...            NaN              NaN         NaN

     smoothness_worst  compactness_worst  concavity_worst  \
0              0.1216             0.1486              0.0
1              0.1223             0.3416              NaN
2              0.1234                NaN              NaN
```

```
3              0.1256               NaN              NaN
4              0.1275               NaN              NaN
..                ...               ...              ...
564               NaN               NaN              NaN
565               NaN               NaN              NaN
566               NaN               NaN              NaN
567               NaN               NaN              NaN
568               NaN               NaN              NaN

     concave points_worst  symmetry_worst  fractal_dimension_worst  \
0                     0.0          0.2226                  0.07427
1                     NaN          0.2369                      NaN
2                     NaN          0.2383                      NaN
3                     NaN          0.2972                      NaN
4                     NaN          0.3109                      NaN
..                    ...             ...                      ...
564                   NaN             NaN                      NaN
565                   NaN             NaN                      NaN
566                   NaN             NaN                      NaN
567                   NaN             NaN                      NaN
568                   NaN             NaN                      NaN

     Unnamed: 32
0            NaN
1            NaN
2            NaN
3            NaN
4            NaN
..           ...
564          NaN
565          NaN
566          NaN
567          NaN
568          NaN

[569 rows x 33 columns]
```

Statistical data

In [6]:
```
df.describe()
```

Out[6]:

	id	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_mean	compactness_mean	concavity_mean
count	5.690000e+02	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000	569.000000
mean	3.037183e+07	14.127292	19.289649	91.969033	654.889104	0.096360	0.104341	0.088799
std	1.250206e+08	3.524049	4.301036	24.298981	351.914129	0.014064	0.052813	0.079720
min	8.670000e+03	6.981000	9.710000	43.790000	143.500000	0.052630	0.019380	0.000000
25%	8.692180e+05	11.700000	16.170000	75.170000	420.300000	0.086370	0.064920	0.029560
50%	9.060240e+05	13.370000	18.840000	86.240000	551.100000	0.095870	0.092630	0.061540
75%	8.813129e+06	15.780000	21.800000	104.100000	782.700000	0.105300	0.130400	0.130700
max	9.113205e+08	28.110000	39.280000	188.500000	2501.000000	0.163400	0.345400	0.426800

8 rows × 32 columns

Sum

In [7]:
```
print(df.sum())
```

```
id                                                      17281572085
diagnosis                MMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMBMMMMMMMM...
radius_mean                                                8038.429
texture_mean                                               10975.81
perimeter_mean                                             52330.38
area_mean                                                  372631.9
smoothness_mean                                              54.829
compactness_mean                                           59.37002
concavity_mean                                             50.526811
concave points_mean                                        27.834994
symmetry_mean                                               103.0811
fractal_dimension_mean                                      35.73184
radius_se                                                   230.5429
texture_se                                                  692.3896
perimeter_se                                               1630.7877
area_se                                                    22951.798
smoothness_se                                               4.006317
compactness_se                                             14.497061
concavity_se                                               18.147525
concave points_se                                           6.712002
symmetry_se                                                11.688568
fractal_dimension_se                                          2.1593
radius_worst                                                9257.169
texture_worst                                               14610.34
perimeter_worst                                             61031.63
area_worst                                                  501051.8
smoothness_worst                                            75.31773
compactness_worst                                          144.67681
concavity_worst                                            154.875247
concave points_worst                                        65.210941
symmetry_worst                                                165.053
fractal_dimension_worst                                      47.76517
Unnamed: 32                                                       0.0
dtype: object
```

Cumsum

In [8]:
```
df.cumsum()
```

Out[8]:

	id	diagnosis	radius_mean	texture_mean	perimeter_m
0	842302	M	17.990	10.38	12
1	1684819	MM	38.560	28.15	25
2	85985722	MMM	58.250	49.40	38
3	170334023	MMMM	69.670	69.78	46
4	254692425	MMMMM	89.960	84.12	59
...	...	...	...	...	
564	17278698457	MMMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMMMBMMMMMMMM...	7973.339	10865.61	5190
565	17279625139	MMMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMMMBMMMMMMMM...	7993.469	10893.86	5203
566	17280552093	MMMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMMMBMMMMMMMM...	8010.069	10921.94	5214
567	17281479334	MMMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMMMBMMMMMMMM...	8030.669	10951.27	5228
568	17281572085	MMMMMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMMMMMMBMMMMMMMM...	8038.429	10975.81	5233

569 rows × 33 columns

Count

In [9]:
```
print(df.count())
```

```
id                         569
diagnosis                  569
radius_mean                569
texture_mean               569
perimeter_mean             569
area_mean                  569
smoothness_mean            569
compactness_mean           569
concavity_mean             569
concave points_mean        569
symmetry_mean              569
fractal_dimension_mean     569
radius_se                  569
texture_se                 569
perimeter_se               569
area_se                    569
smoothness_se              569
compactness_se             569
concavity_se               569
concave points_se          569
symmetry_se                569
fractal_dimension_se       569
radius_worst               569
texture_worst              569
perimeter_worst            569
area_worst                 569
smoothness_worst           569
compactness_worst          569
concavity_worst            569
concave points_worst       569
symmetry_worst             569
fractal_dimension_worst    569
Unnamed: 32                  0
dtype: int64
```

Min

In [10]:
```
print(df.min())
```

```
id                          8670
diagnosis                      B
radius_mean                6.981
texture_mean                9.71
perimeter_mean             43.79
area_mean                  143.5
smoothness_mean          0.05263
compactness_mean         0.01938
concavity_mean               0.0
concave points_mean          0.0
symmetry_mean              0.106
fractal_dimension_mean     0.04996
radius_se                  0.1115
texture_se                 0.3602
perimeter_se                0.757
area_se                     6.802
smoothness_se            0.001713
compactness_se           0.002252
concavity_se                 0.0
concave points_se            0.0
symmetry_se              0.007882
fractal_dimension_se     0.000895
radius_worst                 7.93
texture_worst               12.02
perimeter_worst             50.41
area_worst                  185.2
smoothness_worst         0.07117
compactness_worst        0.02729
concavity_worst              0.0
concave points_worst         0.0
symmetry_worst             0.1565
fractal_dimension_worst    0.05504
Unnamed: 32                    NaN
dtype: object
```

Max

In [11]:
```
print(df.max())
```

```
id                         911320502
diagnosis                          M
radius_mean                    28.11
texture_mean                   39.28
perimeter_mean                 188.5
area_mean                     2501.0
smoothness_mean               0.1634
compactness_mean              0.3454
concavity_mean                0.4268
concave points_mean           0.2012
symmetry_mean                  0.304
fractal_dimension_mean       0.09744
radius_se                      2.873
texture_se                     4.885
perimeter_se                   21.98
area_se                        542.2
smoothness_se                0.03113
compactness_se                0.1354
concavity_se                   0.396
concave points_se            0.05279
symmetry_se                  0.07895
fractal_dimension_se         0.02984
radius_worst                   36.04
texture_worst                  49.54
perimeter_worst                251.2
area_worst                    4254.0
smoothness_worst              0.2226
compactness_worst              1.058
concavity_worst                1.252
concave points_worst           0.291
symmetry_worst                0.6638
fractal_dimension_worst       0.2075
Unnamed: 32                      NaN
dtype: object
```

Covarience

In [13]:
```
cov(df["radius_worst"],df["texture_worst"])
```

Out[13]:
```
array([[23.36022418, 10.69193114],
       [10.69193114, 37.77648277]])
```

Correaltion

In [14]:
```
pearsonr(df['radius_worst'],df['texture_worst'])
```

Out[14]:
```
(0.35992075422104824, 7.623197732291515e-19)
```

In [15]:
```
spearmanr(df['radius_worst'],df['texture_worst'])
```

Out[15]:
```
SpearmanrResult(correlation=0.3712298373090891, pvalue=4.9417532411760144e-20)
```

In [ ]:
```

```