

```
mk 25-07-23
```

```
In [104]: import numpy as np
import pandas as pd
```

```
In [105]: a=pd.read_csv(r"C:\Users\user\Downloads\8_BreastCancerPrediction.csv")
a
```

Out[105]:

	id	diagnosis	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_
0	842302	M	17.99	10.38	122.80	1001.0	0.
1	842517	M	20.57	17.77	132.90	1326.0	0.0
2	84300903	M	19.69	21.25	130.00	1203.0	0.0
3	84348301	M	11.42	20.38	77.58	386.1	0.0
4	84358402	M	20.29	14.34	135.10	1297.0	0.0
...
564	926424	M	21.56	22.39	142.00	1479.0	0.0
565	926682	M	20.13	28.25	131.20	1261.0	0.0
566	926954	M	16.60	28.08	108.30	858.1	0.0
567	927241	M	20.60	29.33	140.10	1265.0	0.0
568	92751	B	7.76	24.54	47.92	181.0	0.0

569 rows × 33 columns



```
In [106]: a=a.head(50)
```



```
In [108]: a.mean()
```

```
Out[108]: id                2.159747e+07
          radius_mean       1.537720e+01
          texture_mean      2.017840e+01
          perimeter_mean    1.014000e+02
          area_mean         7.619980e+02
          smoothness_mean   1.040818e-01
          compactness_mean  1.420350e-01
          concavity_mean    1.339844e-01
          concave points_mean 7.351774e-02
          symmetry_mean     1.984000e-01
          fractal_dimension_mean 6.527360e-02
          radius_se         4.969320e-01
          texture_se        1.108972e+00
          perimeter_se      3.614820e+00
          area_se           5.237550e+01
          smoothness_se     6.305200e-03
          compactness_se    3.045896e-02
          concavity_se      3.627160e-02
          concave points_se  1.376584e-02
          symmetry_se       2.083444e-02
          fractal_dimension_se 4.104680e-03
          radius_worst      1.874788e+01
          texture_worst     2.774940e+01
          perimeter_worst   1.260840e+02
          area_worst        1.136740e+03
          smoothness_worst  1.479596e-01
          compactness_worst  4.010440e-01
          concavity_worst   4.361516e-01
          concave points_worst 1.713398e-01
          symmetry_worst    3.502700e-01
          fractal_dimension_worst 9.903300e-02
          Unnamed: 32      NaN
          dtype: float64
```

```
In [109]: a.median()
```

```
Out[109]: id                        855037.000000
          radius_mean              15.145000
          texture_mean             20.825000
          perimeter_mean           99.905000
          area_mean                701.600000
          smoothness_mean          0.102750
          compactness_mean         0.133200
          concavity_mean           0.133350
          concave points_mean      0.074965
          symmetry_mean            0.190150
          fractal_dimension_mean   0.063365
          radius_se                0.442850
          texture_se               0.984050
          perimeter_se             3.187500
          area_se                  42.250000
          smoothness_se            0.005963
          compactness_se           0.027950
          concavity_se             0.032895
          concave points_se        0.012205
          symmetry_se              0.018230
          fractal_dimension_se     0.003677
          radius_worst             17.845000
          texture_worst            28.060000
          perimeter_worst          123.600000
          area_worst               962.050000
          smoothness_worst         0.149250
          compactness_worst        0.386900
          concavity_worst          0.426350
          concave points_worst     0.179750
          symmetry_worst           0.356050
          fractal_dimension_worst  0.096120
          Unnamed: 32              NaN
          dtype: float64
```

In [110]: `a.mode()`

Out[110]:

	id	diagnosis	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_m
0	85715	M	13.17	10.38	130.0	201.9	0.
1	842302	NaN	16.13	12.44	NaN	273.9	
2	842517	NaN	NaN	14.26	NaN	371.1	
3	843786	NaN	NaN	14.34	NaN	386.1	
4	844359	NaN	NaN	14.36	NaN	440.6	
5	844981	NaN	NaN	14.63	NaN	449.3	
6	845636	NaN	NaN	15.05	NaN	475.9	
7	846226	NaN	NaN	15.70	NaN	477.1	
8	846381	NaN	NaN	15.71	NaN	519.8	
9	848406	NaN	NaN	16.40	NaN	520.0	
10	849014	NaN	NaN	16.84	NaN	523.8	
11	851509	NaN	NaN	17.60	NaN	531.5	
12	852552	NaN	NaN	17.77	NaN	534.6	
13	852631	NaN	NaN	17.88	NaN	545.2	
14	852763	NaN	NaN	17.89	NaN	559.2	
15	852781	NaN	NaN	18.42	NaN	561.0	
16	852973	NaN	NaN	18.66	NaN	563.0	
17	853201	NaN	NaN	18.70	NaN	566.3	
18	853401	NaN	NaN	19.98	NaN	577.9	
19	853612	NaN	NaN	20.13	NaN	578.3	
20	854002	NaN	NaN	20.25	NaN	633.0	
21	854039	NaN	NaN	20.28	NaN	644.8	
22	854253	NaN	NaN	20.38	NaN	658.8	
23	854268	NaN	NaN	20.68	NaN	684.5	
24	854941	NaN	NaN	20.82	NaN	698.8	
25	855133	NaN	NaN	20.83	NaN	704.4	
26	855138	NaN	NaN	21.25	NaN	732.4	
27	855167	NaN	NaN	21.35	NaN	781.0	
28	855563	NaN	NaN	21.38	NaN	782.7	
29	855625	NaN	NaN	21.53	NaN	797.8	
30	856106	NaN	NaN	21.58	NaN	798.8	
31	857010	NaN	NaN	21.59	NaN	807.2	
32	857155	NaN	NaN	21.72	NaN	869.5	
33	857156	NaN	NaN	21.81	NaN	899.3	
34	8510426	NaN	NaN	21.82	NaN	904.6	

	id	diagnosis	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_r
35	8510653	NaN	NaN	22.15	NaN	912.7	
36	8510824	NaN	NaN	22.30	NaN	955.1	
37	8511133	NaN	NaN	22.61	NaN	1001.0	
38	84300903	NaN	NaN	23.04	NaN	1040.0	
39	84348301	NaN	NaN	23.24	NaN	1076.0	
40	84358402	NaN	NaN	23.95	NaN	1088.0	
41	84458202	NaN	NaN	23.98	NaN	1094.0	
42	84501001	NaN	NaN	24.04	NaN	1104.0	
43	84610002	NaN	NaN	24.80	NaN	1123.0	
44	84667401	NaN	NaN	24.81	NaN	1162.0	
45	84799002	NaN	NaN	25.11	NaN	1203.0	
46	84862001	NaN	NaN	25.20	NaN	1260.0	
47	85382601	NaN	NaN	25.27	NaN	1297.0	
48	85638502	NaN	NaN	26.47	NaN	1326.0	
49	85713702	NaN	NaN	27.54	NaN	1404.0	

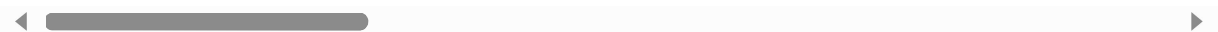
50 rows × 33 columns

In [111]: a.describe()

Out[111]:

	id	radius_mean	texture_mean	perimeter_mean	area_mean	smoothness_mea
count	5.000000e+01	50.000000	50.000000	50.00000	50.000000	50.00000
mean	2.159747e+07	15.377200	20.178400	101.40000	761.998000	0.10408
std	3.594020e+07	3.011576	3.828225	20.43648	294.515104	0.01305
min	8.571500e+04	8.196000	10.380000	51.71000	201.900000	0.08162
25%	8.525718e+05	13.197500	17.797500	86.36250	537.250000	0.09499
50%	8.550370e+05	15.145000	20.825000	99.90500	701.600000	0.10275
75%	8.511056e+06	17.885000	22.532500	118.70000	989.525000	0.11285
max	8.571370e+07	21.160000	27.540000	137.20000	1404.000000	0.14250

8 rows × 32 columns



In [112]: `a.cumsum()`

Out[112]:

	id	diagnosis	r
0	842302	M	
1	1684819	MM	
2	85985722	MMM	
3	170334023	MMMM	
4	254692425	MMMMM	
5	255536211	MMMMMM	
6	256380570	MMMMMMM	
7	340838772	MMMMMMMM	
8	341683753	MMMMMMMMM	
9	426184754	MMMMMMMMMM	
10	427030390	MMMMMMMMMMM	
11	511640392	MMMMMMMMMMMM	
12	512486618	MMMMMMMMMMMMM	
13	513332999	MMMMMMMMMMMMMM	
14	598000400	MMMMMMMMMMMMMMM	
15	682799402	MMMMMMMMMMMMMMM	
16	683647808	MMMMMMMMMMMMMMMM	
17	768509809	MMMMMMMMMMMMMMMMM	
18	769358823	MMMMMMMMMMMMMMMMM	
19	777869249	MMMMMMMMMMMMMMMMMB	
20	786379902	MMMMMMMMMMMMMMMMMBB	
21	794890726	MMMMMMMMMMMMMMMMMBBB	
22	803401859	MMMMMMMMMMMMMMMMMBBBM	
23	804253368	MMMMMMMMMMMMMMMMMBBBMM	
24	805105920	MMMMMMMMMMMMMMMMMBBBMMM	
25	805958551	MMMMMMMMMMMMMMMMMBBBMMMM	
26	806811314	MMMMMMMMMMMMMMMMMBBBMMMMM	
27	807664095	MMMMMMMMMMMMMMMMMBBBMMMMMM	
28	808517068	MMMMMMMMMMMMMMMMMBBBMMMMMMM	
29	809370269	MMMMMMMMMMMMMMMMMBBBMMMMMMMM	
30	810223670	MMMMMMMMMMMMMMMMMBBBMMMMMMMMM	
31	811077282	MMMMMMMMMMMMMMMMMBBBMMMMMMMMMM	
32	896459883	MMMMMMMMMMMMMMMMMBBBMMMMMMMMMMM	
33	897313885	MMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMM	
34	898167924	MMMMMMMMMMMMMMMMMBBBMMMMMMMMMMMMM	

50 rows × 33 columns

```
In [113]: a.count()
```

```
Out[113]: id                    50
          diagnosis             50
          radius_mean           50
          texture_mean          50
          perimeter_mean        50
          area_mean             50
          smoothness_mean       50
          compactness_mean      50
          concavity_mean        50
          concave points_mean    50
          symmetry_mean          50
          fractal_dimension_mean 50
          radius_se             50
          texture_se            50
          perimeter_se          50
          area_se               50
          smoothness_se         50
          compactness_se        50
          concavity_se          50
          concave points_se     50
          symmetry_se           50
          fractal_dimension_se  50
          radius_worst          50
          texture_worst         50
          perimeter_worst       50
          area_worst            50
          smoothness_worst      50
          compactness_worst     50
          concavity_worst       50
          concave points_worst  50
          symmetry_worst        50
          fractal_dimension_worst 50
          Unnamed: 32           0
          dtype: int64
```

```
In [114]: a.min()
```

```
Out[114]: id                        85715  
          diagnosis                 B  
          radius_mean              8.196  
          texture_mean             10.38  
          perimeter_mean           51.71  
          area_mean                201.9  
          smoothness_mean          0.08162  
          compactness_mean         0.03766  
          concavity_mean            0.01588  
          concave points_mean      0.005917  
          symmetry_mean             0.1467  
          fractal_dimension_mean    0.05278  
          radius_se                 0.1563  
          texture_se                0.5914  
          perimeter_se              1.094  
          area_se                   8.205  
          smoothness_se            0.003139  
          compactness_se           0.004899  
          concavity_se              0.01101  
          concave points_se        0.00566  
          symmetry_se               0.007882  
          fractal_dimension_se     0.001286  
          radius_worst              8.964  
          texture_worst             15.66  
          perimeter_worst           57.26  
          area_worst                242.2  
          smoothness_worst         0.09387  
          compactness_worst        0.04619  
          concavity_worst           0.02398  
          concave points_worst     0.02564  
          symmetry_worst            0.1565  
          fractal_dimension_worst  0.05504  
          Unnamed: 32              NaN  
          dtype: object
```

```
In [115]: a.max()
```

```
Out[115]: id                        85713702
          diagnosis                  M
          radius_mean               21.16
          texture_mean              27.54
          perimeter_mean            137.2
          area_mean                 1404.0
          smoothness_mean           0.1425
          compactness_mean          0.2839
          concavity_mean             0.3001
          concave points_mean        0.1471
          symmetry_mean              0.304
          fractal_dimension_mean     0.09744
          radius_se                  1.214
          texture_se                 3.568
          perimeter_se               11.07
          area_se                    153.4
          smoothness_se              0.01149
          compactness_se             0.1006
          concavity_se               0.09723
          concave points_se          0.0409
          symmetry_se                0.05963
          fractal_dimension_se       0.01284
          radius_worst               29.17
          texture_worst              40.68
          perimeter_worst            188.0
          area_worst                 2615.0
          smoothness_worst           0.2098
          compactness_worst          1.058
          concavity_worst             1.105
          concave points_worst        0.2701
          symmetry_worst              0.6638
          fractal_dimension_worst     0.2075
          Unnamed: 32                NaN
          dtype: object
```

```
In [116]: from numpy import cov
```

```
In [118]: cov(a['id'])
```

```
Out[118]: array(1.29169802e+15)
```

```
In [119]: from scipy.stats import pearsonr
          pearsonr(a['area_mean'],a['perimeter_mean'])
```

```
Out[119]: (0.9849867881531986, 2.7984041813822123e-38)
```

```
In [120]: from scipy.stats import spearmanr
          spearmanr(a['id'],a['texture_mean'])
```

```
Out[120]: SpearmanrResult(correlation=-0.006194477791116446, pvalue=0.9659453951391318)
```

In []:

In []: