

```
In [ ]: import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

Data Preparation

```
In [ ]: df = sns.load_dataset('iris')
df.head()
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

Central Tendency

Mean

```
In [ ]: df.mean(numeric_only=True)
```

```
Out[ ]: sepal_length    5.843333
sepal_width          3.057333
petal_length         3.758000
petal_width          1.199333
dtype: float64
```

```
In [ ]: df.groupby("species").mean(numeric_only=True)
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width
species				
setosa	5.006	3.428	1.462	0.246
versicolor	5.936	2.770	4.260	1.326
virginica	6.588	2.974	5.552	2.026

Median

```
In [ ]: df.median(numeric_only=True)
```

```
Out[ ]: sepal_length    5.80  
        sepal_width     3.00  
        petal_length     4.35  
        petal_width      1.30  
        dtype: float64
```

```
In [ ]: df.groupby("species").median(numeric_only=True)
```

```
Out[ ]:      sepal_length  sepal_width  petal_length  petal_width  
species  
setosa           5.0           3.4           1.50           0.2  
versicolor       5.9           2.8           4.35           1.3  
virginica        6.5           3.0           5.55           2.0
```

Dispersion

Variance

```
In [ ]: df.var(numeric_only=True)
```

```
Out[ ]: sepal_length    0.685694  
        sepal_width     0.189979  
        petal_length     3.116278  
        petal_width      0.581006  
        dtype: float64
```

Standard Deviation

```
In [ ]: df.std(numeric_only=True)
```

```
Out[ ]: sepal_length    0.828066  
        sepal_width     0.435866  
        petal_length     1.765298  
        petal_width      0.762238  
        dtype: float64
```

Relatedness

Correlation

```
In [ ]: df.corr(numeric_only=True)
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width
sepal_length	1.000000	-0.117570	0.871754	0.817941
sepal_width	-0.117570	1.000000	-0.428440	-0.366126
petal_length	0.871754	-0.428440	1.000000	0.962865
petal_width	0.817941	-0.366126	0.962865	1.000000

Covariance

```
In [ ]: df.cov(numeric_only=True)
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width
sepal_length	0.685694	-0.042434	1.274315	0.516271
sepal_width	-0.042434	0.189979	-0.329656	-0.121639
petal_length	1.274315	-0.329656	3.116278	1.295609
petal_width	0.516271	-0.121639	1.295609	0.581006

Quantiles

Quartiles

```
In [ ]: df.quantile(np.arange(0.25, 1.1, 0.25), axis = 0, numeric_only=True)
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width
0.25	5.1	2.8	1.60	0.3
0.50	5.8	3.0	4.35	1.3
0.75	6.4	3.3	5.10	1.8
1.00	7.9	4.4	6.90	2.5

Deciles

```
In [ ]: df.quantile(np.arange(0.1, 1.1, 0.1), axis = 0, numeric_only=True)
```

Out[]:	sepal_length	sepal_width	petal_length	petal_width
0.1	4.80	2.50	1.40	0.20
0.2	5.00	2.70	1.50	0.20
0.3	5.27	2.80	1.70	0.40
0.4	5.60	3.00	3.90	1.16
0.5	5.80	3.00	4.35	1.30
0.6	6.10	3.10	4.64	1.50
0.7	6.30	3.20	5.00	1.80
0.8	6.52	3.40	5.32	1.90
0.9	6.90	3.61	5.80	2.20
1.0	7.90	4.40	6.90	2.50

Percentiles

```
In [ ]: df.quantile(np.arange(0.01, 1.01, 0.01), axis = 0, numeric_only=True)
```

Out[]:	sepal_length	sepal_width	petal_length	petal_width
0.01	4.400	2.200	1.149	0.100
0.02	4.400	2.200	1.200	0.100
0.03	4.547	2.300	1.300	0.147
0.04	4.600	2.300	1.300	0.200
0.05	4.600	2.345	1.300	0.200
...
0.96	7.408	3.804	6.108	2.304
0.97	7.653	3.900	6.353	2.400
0.98	7.700	4.002	6.602	2.402
0.99	7.700	4.151	6.700	2.500
1.00	7.900	4.400	6.900	2.500

100 rows × 4 columns

Box Plot/Whisker Plot

```
In [ ]: bdf = df.drop(['species'], axis=1)
bdf
```

```
Out[ ]:
```

	sepal_length	sepal_width	petal_length	petal_width
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2
...
145	6.7	3.0	5.2	2.3
146	6.3	2.5	5.0	1.9
147	6.5	3.0	5.2	2.0
148	6.2	3.4	5.4	2.3
149	5.9	3.0	5.1	1.8

150 rows × 4 columns

```
In [ ]: sns.boxplot(data=bdf)
plt.show()
```



