

```
from sklearn.datasets import load_iris
iris = load_iris()
```

```
import pandas as pd
import numpy as np
print('Your pandas version is: %s' % pd.__version__)
print('Your NumPy version is: %s' % np.__version__)
iris_nparray = iris.data
iris_dataframe = pd.DataFrame(iris.data, columns = iris.feature_names)
iris_dataframe['group'] = pd.Series([iris.target_names[k] for k in iris.target], dtype = "category")
```

```
↳ Your pandas version is: 0.24.2
   Your NumPy version is: 1.16.3
```

```
print(iris_dataframe.mean(numeric_only = True))
```

```
↳ sepal length (cm)    5.843333
   sepal width (cm)     3.057333
   petal length (cm)    3.758000
   petal width (cm)     1.199333
   dtype: float64
```

```
print(iris_dataframe.median(numeric_only = True))
```

```
↳ sepal length (cm)    5.80
   sepal width (cm)     3.00
   petal length (cm)    4.35
   petal width (cm)     1.30
   dtype: float64
```

```
print(iris_dataframe.std())
```

```
↳ sepal length (cm)    0.828066
   sepal width (cm)     0.435866
   petal length (cm)    1.765298
   petal width (cm)     0.762238
   dtype: float64
```

```
print(iris_dataframe.max(numeric_only = True) - iris_dataframe.min(numeric_only = True))
```

```
↳ sepal length (cm)    3.6
   sepal width (cm)     2.4
   petal length (cm)    5.9
   petal width (cm)     2.4
   dtype: float64
```

```
print(iris_dataframe.quantile(np.array([0, 0.25, 0.50, 0.75, 1])))
```

```
↳
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0.00	4.3	2.0	1.00	0.1
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

```
from scipy.stats import kurtosis, kurtosistest
k = kurtosis(iris_dataframe['petal length (cm)'])
zscore, pvalue = kurtosistest(iris_dataframe['petal length (cm)'])
print('Kurtosis %0.3f z-score %0.3f p-value %0.3f' % (k, zscore, pvalue))
```

```
↳ Kurtosis -1.396 z-score -14.823 p-value 0.000
```

```
from scipy.stats import skew, skewtest
s = skew(iris_dataframe['petal length (cm)'])
zscore, pvalue = skewtest(iris_dataframe['petal length (cm)'])
print('Skewness %0.3f z-score %0.3f p-value %0.3f' % (s, zscore, pvalue))
```

```
↳ Skewness -0.272 z-score -1.400 p-value 0.162
```

```
iris_binned = pd.concat([
    pd.qcut(iris_dataframe.iloc[:,0], [0, 0.25, 0.50, 0.75, 1]),
    pd.qcut(iris_dataframe.iloc[:,1], [0, 0.25, 0.50, 0.75, 1]),
    pd.qcut(iris_dataframe.iloc[:,2], [0, 0.25, 0.50, 0.75, 1]),
    pd.qcut(iris_dataframe.iloc[:,3], [0, 0.25, 0.50, 0.75, 1]),
], join = 'outer', axis = 1)
```

```
print(iris_dataframe['group'].value_counts())
```

```

↳ virginica      50
   versicolor    50
   setosa         50
   Name: group, dtype: int64

```

```
print(iris_binned['petal length (cm)'].value_counts())
```

```

↳ (0.999, 1.6]      44
   (4.35, 5.1]      41
   (5.1, 6.9]       34
   (1.6, 4.35]      31
   Name: petal length (cm), dtype: int64

```

```
print(iris_dataframe.cov())
```

```

↳
      sepal length (cm)  ...  petal width (cm)
sepal length (cm)      0.685694  ...      0.516271
sepal width (cm)      -0.042434  ...      -0.121639
petal length (cm)      1.274315  ...      1.295609
petal width (cm)       0.516271  ...      0.581006

[4 rows x 4 columns]

```

```
print(iris_dataframe.corr())
```

```

↳
      sepal length (cm)  ...  petal width (cm)
sepal length (cm)      1.000000  ...      0.817941
sepal width (cm)      -0.117570  ...      -0.366126
petal length (cm)      0.871754  ...      0.962865
petal width (cm)       0.817941  ...      1.000000

[4 rows x 4 columns]

```

```

from scipy.stats import spearmanr
from scipy.stats import pearsonr
spearmanr_coef, spearmanr_p = spearmanr(iris_dataframe['sepal length (cm)'], iris_dataframe['sepal width (cm)'])
pearsonr_coef, pearsonr_p = pearsonr(iris_dataframe['sepal length (cm)'], iris_dataframe['sepal width (cm)'])
print('Pearson correlation %0.3f & Spearman correlation %0.3f' % (pearsonr_coef, spearmanr_coef))

```

↗ Pearson correlation -0.118 & Spearman correlation -0.167