```python
In [4]:   import pandas as pd
```

```python
In [6]:   import numpy as nm
```

```python
In [21]:  csv_url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data
```

```python
In [22]:  iris = pd.read_csv(csv_url, header = None)
```

```python
In [23]:  col_names = ['Sepal_Length','Sepal_Width','Petal_Length','Petal_Width','Species']
```

```python
In [24]:  iris = pd.read_csv(csv_url, names = col_names)
```

```python
In [25]:  dataset = pd.DataFrame(iris)
```

```python
In [26]:  dataset
```

Out[26]:

|     | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
| --- | --- | --- | --- | --- | --- |
| 0 | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa |
| 1 | 4.9 | 3.0 | 1.4 | 0.2 | Iris-setosa |
| 2 | 4.7 | 3.2 | 1.3 | 0.2 | Iris-setosa |
| 3 | 4.6 | 3.1 | 1.5 | 0.2 | Iris-setosa |
| 4 | 5.0 | 3.6 | 1.4 | 0.2 | Iris-setosa |
| ... | ... | ... | ... | ... | ... |
| 145 | 6.7 | 3.0 | 5.2 | 2.3 | Iris-virginica |
| 146 | 6.3 | 2.5 | 5.0 | 1.9 | Iris-virginica |
| 147 | 6.5 | 3.0 | 5.2 | 2.0 | Iris-virginica |
| 148 | 6.2 | 3.4 | 5.4 | 2.3 | Iris-virginica |
| 149 | 5.9 | 3.0 | 5.1 | 1.8 | Iris-virginica |

150 rows × 5 columns

```python
In [27]:  dataset.head(n = 6)
```

Out[27]:

| | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
|---|---|---|---|---|---|
| 0 | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa |
| 1 | 4.9 | 3.0 | 1.4 | 0.2 | Iris-setosa |
| 2 | 4.7 | 3.2 | 1.3 | 0.2 | Iris-setosa |
| 3 | 4.6 | 3.1 | 1.5 | 0.2 | Iris-setosa |
| 4 | 5.0 | 3.6 | 1.4 | 0.2 | Iris-setosa |
| 5 | 5.4 | 3.9 | 1.7 | 0.4 | Iris-setosa |

In [28]:
```python
dataset.tail()
```

Out[28]:

| | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
|---|---|---|---|---|---|
| 145 | 6.7 | 3.0 | 5.2 | 2.3 | Iris-virginica |
| 146 | 6.3 | 2.5 | 5.0 | 1.9 | Iris-virginica |
| 147 | 6.5 | 3.0 | 5.2 | 2.0 | Iris-virginica |
| 148 | 6.2 | 3.4 | 5.4 | 2.3 | Iris-virginica |
| 149 | 5.9 | 3.0 | 5.1 | 1.8 | Iris-virginica |

In [29]:
```python
dataset.index
```

Out[29]: RangeIndex(start=0, stop=150, step=1)

In [30]:
```python
dataset.columns
```

Out[30]: Index(['Sepal_Length', 'Sepal_Width', 'Petal_Length', 'Petal_Width',
       'Species'],
      dtype='object')

In [31]:
```python
dataset.shape
```

Out[31]: (150, 5)

In [32]:
```python
dataset.dtypes
```

Out[32]: Sepal_Length    float64
        Sepal_Width     float64
        Petal_Length    float64
        Petal_Width     float64
        Species          object
        dtype: object

In [33]:
```python
dataset.columns.values
```

Out[33]: array(['Sepal_Length', 'Sepal_Width', 'Petal_Length', 'Petal_Width',
       'Species'], dtype=object)

In [34]: `dataset.describe(include="all")`

Out[34]:

|        | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
|--------|--------------|-------------|--------------|-------------|-------------|
| count  | 150.000000   | 150.000000  | 150.000000   | 150.000000  | 150 |
| unique | NaN          | NaN         | NaN          | NaN         | 3 |
| top    | NaN          | NaN         | NaN          | NaN         | Iris-setosa |
| freq   | NaN          | NaN         | NaN          | NaN         | 50 |
| mean   | 5.843333     | 3.054000    | 3.758667     | 1.198667    | NaN |
| std    | 0.828066     | 0.433594    | 1.764420     | 0.763161    | NaN |
| min    | 4.300000     | 2.000000    | 1.000000     | 0.100000    | NaN |
| 25%    | 5.100000     | 2.800000    | 1.600000     | 0.300000    | NaN |
| 50%    | 5.800000     | 3.000000    | 4.350000     | 1.300000    | NaN |
| 75%    | 6.400000     | 3.300000    | 5.100000     | 1.800000    | NaN |
| max    | 7.900000     | 4.400000    | 6.900000     | 2.500000    | NaN |

In [36]: `dataset['Sepal_Length']`

Out[36]:
```
0      5.1
1      4.9
2      4.7
3      4.6
4      5.0
       ...
145    6.7
146    6.3
147    6.5
148    6.2
149    5.9
Name: Sepal_Length, Length: 150, dtype: float64
```

In [46]: `dataset.sort_index(axis=1,ascending=False)`

Out[46]:

| | Species | Sepal_Width | Sepal_Length | Petal_Width | Petal_Length |
|---|---|---|---|---|---|
| **0** | Iris-setosa | 3.5 | 5.1 | 0.2 | 1.4 |
| **1** | Iris-setosa | 3.0 | 4.9 | 0.2 | 1.4 |
| **2** | Iris-setosa | 3.2 | 4.7 | 0.2 | 1.3 |
| **3** | Iris-setosa | 3.1 | 4.6 | 0.2 | 1.5 |
| **4** | Iris-setosa | 3.6 | 5.0 | 0.2 | 1.4 |
| **...** | ... | ... | ... | ... | ... |
| **145** | Iris-virginica | 3.0 | 6.7 | 2.3 | 5.2 |
| **146** | Iris-virginica | 2.5 | 6.3 | 1.9 | 5.0 |
| **147** | Iris-virginica | 3.0 | 6.5 | 2.0 | 5.2 |
| **148** | Iris-virginica | 3.4 | 6.2 | 2.3 | 5.4 |
| **149** | Iris-virginica | 3.0 | 5.9 | 1.8 | 5.1 |

150 rows × 5 columns

In [47]:
```python
dataset.sort_values(by="Sepal_Length")
```

Out[47]:

| | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
|---|---|---|---|---|---|
| **13** | 4.3 | 3.0 | 1.1 | 0.1 | Iris-setosa |
| **42** | 4.4 | 3.2 | 1.3 | 0.2 | Iris-setosa |
| **38** | 4.4 | 3.0 | 1.3 | 0.2 | Iris-setosa |
| **8** | 4.4 | 2.9 | 1.4 | 0.2 | Iris-setosa |
| **41** | 4.5 | 2.3 | 1.3 | 0.3 | Iris-setosa |
| **...** | ... | ... | ... | ... | ... |
| **122** | 7.7 | 2.8 | 6.7 | 2.0 | Iris-virginica |
| **118** | 7.7 | 2.6 | 6.9 | 2.3 | Iris-virginica |
| **117** | 7.7 | 3.8 | 6.7 | 2.2 | Iris-virginica |
| **135** | 7.7 | 3.0 | 6.1 | 2.3 | Iris-virginica |
| **131** | 7.9 | 3.8 | 6.4 | 2.0 | Iris-virginica |

150 rows × 5 columns

In [48]:
```python
dataset.iloc[5]
```

Out[48]:
```
Sepal_Length            5.4
Sepal_Width             3.9
Petal_Length            1.7
Petal_Width             0.4
Species         Iris-setosa
Name: 5, dtype: object
```

In [49]: `dataset[0:3]`

Out[49]:

| | Sepal_Length | Sepal_Width | Petal_Length | Petal_Width | Species |
|---|---|---|---|---|---|
| **0** | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa |
| **1** | 4.9 | 3.0 | 1.4 | 0.2 | Iris-setosa |
| **2** | 4.7 | 3.2 | 1.3 | 0.2 | Iris-setosa |

In [50]: `dataset.loc[:, ['Sepal_Length','Sepal_Width']]`

Out[50]:

| | Sepal_Length | Sepal_Width |
|---|---|---|
| **0** | 5.1 | 3.5 |
| **1** | 4.9 | 3.0 |
| **2** | 4.7 | 3.2 |
| **3** | 4.6 | 3.1 |
| **4** | 5.0 | 3.6 |
| **...** | ... | ... |
| **145** | 6.7 | 3.0 |
| **146** | 6.3 | 2.5 |
| **147** | 6.5 | 3.0 |
| **148** | 6.2 | 3.4 |
| **149** | 5.9 | 3.0 |

150 rows × 2 columns

In [ ]: