In [1]:

```
import pandas as pd
```

In [2]:

```
df=pd.read_csv("/home/ubuntu/Downloads/archive (10)/Iris.csv")
df
```

Out[2]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [3]:

```
df.describe()
```

Out[3]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	75.500000	5.843333	3.054000	3.758667	1.198667
std	43.445368	0.828066	0.433594	1.764420	0.763161
min	1.000000	4.300000	2.000000	1.000000	0.100000
25%	38.250000	5.100000	2.800000	1.600000	0.300000
50%	75.500000	5.800000	3.000000	4.350000	1.300000
75%	112.750000	6.400000	3.300000	5.100000	1.800000
max	150.000000	7.900000	4.400000	6.900000	2.500000

In [4]:

```
df.shape
```

Out[4]:

```
(150, 6)
```

In [5]:

```
df.count()
```

Out[5]:

```
Id               150
SepalLengthCm    150
SepalWidthCm     150
PetalLengthCm    150
PetalWidthCm     150
Species          150
dtype: int64
```

In [6]:

```
df.head()
```

Out[6]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

In [7]:

```
df.tail()
```

Out[7]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

In [8]:

```
df.columns
```

Out[8]:

```
Index(['Id', 'SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm', 'PetalW
idthCm',
       'Species'],
      dtype='object')
```

In [9]:

```
df.index
```

Out[9]:

```
RangeIndex(start=0, stop=150, step=1)
```

In [10]:

```
df.dtypes
```

Out[10]:

```
Id                int64
SepalLengthCm    float64
SepalWidthCm     float64
PetalLengthCm    float64
PetalWidthCm     float64
Species           object
dtype: object
```

In [11]:

```
df.columns.values
```

Out[11]:

```
array(['Id', 'SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm',
       'PetalWidthCm', 'Species'], dtype=object)
```

In [12]:

```
df.isnull()
```

Out[12]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	False	False	False	False	False	False
1	False	False	False	False	False	False
2	False	False	False	False	False	False
3	False	False	False	False	False	False
4	False	False	False	False	False	False
...	...	...	...	...	...	...
145	False	False	False	False	False	False
146	False	False	False	False	False	False
147	False	False	False	False	False	False
148	False	False	False	False	False	False
149	False	False	False	False	False	False

150 rows × 6 columns

In [13]:

```
df.notnull()
```

Out[13]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	True	True	True	True	True	True
1	True	True	True	True	True	True
2	True	True	True	True	True	True
3	True	True	True	True	True	True
4	True	True	True	True	True	True
...	...	...	...	...	...	...
145	True	True	True	True	True	True
146	True	True	True	True	True	True
147	True	True	True	True	True	True
148	True	True	True	True	True	True
149	True	True	True	True	True	True

150 rows × 6 columns

In [14]:

```
df.isnull().sum()
```

Out[14]:

```
Id               0
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
Species          0
dtype: int64
```

In [15]:

```
df['SepalLengthCm'].mean().sum()
```

Out[15]:

```
5.843333333333334
```

In [16]:

```
df['SepalLengthCm'].median().sum()
```

Out[16]:

```
5.8
```

In [17]:

```
df['SepalLengthCm'].std().sum()
```

Out[17]:

```
0.828066127977863
```

In [18]:

```
df=pd.read_csv("/home/ubuntu/Downloads/archive (10)/Iris.csv")
df
```

Out[18]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [19]:

```
df.groupby(['Species'])['SepalLengthCm'].mean()
```

Out[19]:

```
Species
Iris-setosa        5.006
Iris-versicolor    5.936
Iris-virginica     6.588
Name: SepalLengthCm, dtype: float64
```

In [20]:

```
df.groupby(['Species'])['SepalLengthCm'].median()
```

Out[20]:

```
Species
Iris-setosa        5.0
Iris-versicolor    5.9
Iris-virginica     6.5
Name: SepalLengthCm, dtype: float64
```

In [21]:

```
df.groupby(['Species'])['SepalLengthCm'].std()
```

Out[21]:

```
Species
Iris-setosa        0.352490
Iris-versicolor    0.516171
Iris-virginica     0.635880
Name: SepalLengthCm, dtype: float64
```

In [23]:

```
df.groupby(['Species'])['SepalLengthCm'].min()
```

Out[23]:

```
Species
Iris-setosa        4.3
Iris-versicolor    4.9
Iris-virginica     4.9
Name: SepalLengthCm, dtype: float64
```

In [24]:

```
df.groupby(['Species'])['SepalLengthCm'].max()
```

Out[24]:

```
Species
Iris-setosa        5.8
Iris-versicolor    7.0
Iris-virginica     7.9
Name: SepalLengthCm, dtype: float64
```

In [25]:

```
df.groupby(['Species'])['SepalWidthCm'].mean()
```

Out[25]:

```
Species
Iris-setosa        3.418
Iris-versicolor    2.770
Iris-virginica     2.974
Name: SepalWidthCm, dtype: float64
```

In [26]:

```
df.groupby(['Species'])['SepalWidthCm'].median()
```

Out[26]:

```
Species
Iris-setosa        3.4
Iris-versicolor    2.8
Iris-virginica     3.0
Name: SepalWidthCm, dtype: float64
```

In [27]:

```
df.groupby(['Species'])['SepalWidthCm'].std()
```

Out[27]:

```
Species
Iris-setosa        0.381024
Iris-versicolor    0.313798
Iris-virginica     0.322497
Name: SepalWidthCm, dtype: float64
```

In [28]:

```
df.groupby(['Species'])['SepalWidthCm'].min()
```

Out[28]:

```
Species
Iris-setosa        2.3
Iris-versicolor    2.0
Iris-virginica     2.2
Name: SepalWidthCm, dtype: float64
```

In [29]:

```
df.groupby(['Species'])['SepalWidthCm'].max()
```

Out[29]:

```
Species
Iris-setosa        4.4
Iris-versicolor    3.4
Iris-virginica     3.8
Name: SepalWidthCm, dtype: float64
```

In [30]:

```
df.groupby(['Species'])['PetalLengthCm'].mean()
```

Out[30]:

```
Species
Iris-setosa        1.464
Iris-versicolor    4.260
Iris-virginica     5.552
Name: PetalLengthCm, dtype: float64
```

In [32]:

```
df.groupby(['Species'])['PetalLengthCm'].median()
```

Out[32]:

```
Species
Iris-setosa        1.50
Iris-versicolor    4.35
Iris-virginica     5.55
Name: PetalLengthCm, dtype: float64
```

In [33]:

```
df.groupby(['Species'])['PetalLengthCm'].std()
```

Out[33]:

```
Species
Iris-setosa        0.173511
Iris-versicolor    0.469911
Iris-virginica     0.551895
Name: PetalLengthCm, dtype: float64
```

In [34]:

```
df.groupby(['Species'])['PetalLengthCm'].min()
```

Out[34]:

```
Species
Iris-setosa        1.0
Iris-versicolor    3.0
Iris-virginica     4.5
Name: PetalLengthCm, dtype: float64
```

In [35]:

```
df.groupby(['Species'])['PetalLengthCm'].max()
```

Out[35]:

```
Species
Iris-setosa        1.9
Iris-versicolor    5.1
Iris-virginica     6.9
Name: PetalLengthCm, dtype: float64
```

In [36]:

```
df.groupby(['Species'])['PetalWidthCm'].mean()
```

Out[36]:

```
Species
Iris-setosa        0.244
Iris-versicolor    1.326
Iris-virginica     2.026
Name: PetalWidthCm, dtype: float64
```

In [37]:

```
df.groupby(['Species'])['PetalWidthCm'].median()
```

Out[37]:

```
Species
Iris-setosa        0.2
Iris-versicolor    1.3
Iris-virginica     2.0
Name: PetalWidthCm, dtype: float64
```

In [38]:

```
df.groupby(['Species'])['PetalWidthCm'].std()
```

Out[38]:

```
Species
Iris-setosa        0.107210
Iris-versicolor    0.197753
Iris-virginica     0.274650
Name: PetalWidthCm, dtype: float64
```

In [39]:

```
df.groupby(['Species'])['PetalWidthCm'].min()
```

Out[39]:

```
Species
Iris-setosa        0.1
Iris-versicolor    1.0
Iris-virginica     1.4
Name: PetalWidthCm, dtype: float64
```

In [40]:

```
df.groupby(['Species'])['PetalWidthCm'].max()
```

Out[40]:

```
Species
Iris-setosa        0.6
Iris-versicolor    1.8
Iris-virginica     2.5
Name: PetalWidthCm, dtype: float64
```

In [42]:

```
i1=(df['Species']=='Iris-setosa')
print('Iris-setosa')
```

```
Iris-setosa
```

In [43]:

```
print(df[i1].describe())
```

```
              Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWidt
hCm
count  50.00000       50.00000     50.000000      50.000000      50.00
000
mean   25.50000        5.00600      3.418000       1.464000       0.24
400
std    14.57738        0.35249      0.381024       0.173511       0.10
721
min     1.00000        4.30000      2.300000       1.000000       0.10
000
25%    13.25000        4.80000      3.125000       1.400000       0.20
000
50%    25.50000        5.00000      3.400000       1.500000       0.20
000
75%    37.75000        5.20000      3.675000       1.575000       0.30
000
max    50.00000        5.80000      4.400000       1.900000       0.60
000
```

In [46]:

```
df=pd.read_csv("/home/ubuntu/Downloads/archive (10)/Iris.csv")
df
```

Out[46]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [47]:

```
i2=(df['Species']=='Iris-versicolor')
print('Iris-versicolor')
```

```
Iris-versicolor
```

In [48]:

```
print(df[i2].describe())
```

```
              Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWid
thCm
count   50.00000      50.000000     50.000000      50.000000     50.00
0000
mean    75.50000       5.936000      2.770000       4.260000      1.32
6000
std     14.57738       0.516171      0.313798       0.469911      0.19
7753
min     51.00000       4.900000      2.000000       3.000000      1.00
0000
25%     63.25000       5.600000      2.525000       4.000000      1.20
0000
50%     75.50000       5.900000      2.800000       4.350000      1.30
0000
75%     87.75000       6.300000      3.000000       4.600000      1.50
0000
max    100.00000       7.000000      3.400000       5.100000      1.80
0000
```

In [49]:

```
df=pd.read_csv("/home/ubuntu/Downloads/archive (10)/Iris.csv")
df
```

Out[49]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [50]:

```
i3=(df['Species']=='Iris-virginica')
print('Iris-virginica')
```

```
Iris-virginica
```

In [51]:

```
print(df[i3].describe())
```

```
              Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWid
thCm
count   50.00000       50.00000     50.000000      50.000000      50.0
0000
mean   125.50000        6.58800      2.974000       5.552000       2.0
2600
std     14.57738        0.63588      0.322497       0.551895       0.2
7465
min    101.00000        4.90000      2.200000       4.500000       1.4
0000
25%    113.25000        6.22500      2.800000       5.100000       1.8
0000
50%    125.50000        6.50000      3.000000       5.550000       2.0
0000
75%    137.75000        6.90000      3.175000       5.875000       2.3
0000
max    150.00000        7.90000      3.800000       6.900000       2.5
0000
```

In [ ]:

```
```