```
# Practical - 3
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# TCOD74
import pandas as pd

url =
"https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.d
ata"
column_names = ['sepal_length', 'sepal_width', 'petal_length',
'petal_width', 'class']
data = pd.read_csv(url, names=column_names)

summary_statistics = data.groupby('class')['petal_length'].describe()
summary_statistics
```

class	count	mean	std	min	25%	50%	75%	max
Iris-setosa	50.0	1.464	0.173511	1.0	1.4	1.50	1.575	1.9
Iris-versicolor	50.0	4.260	0.469911	3.0	4.0	4.35	4.600	5.1
Iris-virginica	50.0	5.552	0.551895	4.5	5.1	5.55	5.875	6.9

```
setosa = data[data['class'] == 'Iris-setosa']
versicolor = data[data['class'] == 'Iris-versicolor']
virginica = data[data['class'] == 'Iris-virginica']

setosa.describe()
```

	sepal_length	sepal_width	petal_length	petal_width
count	50.00000	50.000000	50.000000	50.00000
mean	5.00600	3.418000	1.464000	0.24400
std	0.35249	0.381024	0.173511	0.10721
min	4.30000	2.300000	1.000000	0.10000
25%	4.80000	3.125000	1.400000	0.20000
50%	5.00000	3.400000	1.500000	0.20000
75%	5.20000	3.675000	1.575000	0.30000
max	5.80000	4.400000	1.900000	0.60000

```
versicolor.describe()
```

	sepal_length	sepal_width	petal_length	petal_width
count	50.000000	50.000000	50.000000	50.000000
mean	5.936000	2.770000	4.260000	1.326000
std	0.516171	0.313798	0.469911	0.197753
min	4.900000	2.000000	3.000000	1.000000
25%	5.600000	2.525000	4.000000	1.200000
50%	5.900000	2.800000	4.350000	1.300000
75%	6.300000	3.000000	4.600000	1.500000
max	7.000000	3.400000	5.100000	1.800000

```
virginica.describe()
```

```
       sepal_length  sepal_width  petal_length  petal_width
count      50.00000    50.000000     50.000000     50.00000
mean        6.58800     2.974000      5.552000      2.02600
std         0.63588     0.322497      0.551895      0.27465
min         4.90000     2.200000      4.500000      1.40000
25%         6.22500     2.800000      5.100000      1.80000
50%         6.50000     3.000000      5.550000      2.00000
75%         6.90000     3.175000      5.875000      2.30000
max         7.90000     3.800000      6.900000      2.50000
```

```
data.dropna(inplace=True)
data
```

```
     sepal_length  sepal_width  petal_length  petal_width
class
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 x 5 columns]
```

```
to_drop_col = ["sepal_length","petal_length"]
data.drop(columns = to_drop_col, inplace=True)
data
```

```
     sepal_width  petal_width           class
0            3.5          0.2     Iris-setosa
1            3.0          0.2     Iris-setosa
2            3.2          0.2     Iris-setosa
3            3.1          0.2     Iris-setosa
4            3.6          0.2     Iris-setosa
```

```
..           ...          ...             ...
145          3.0          2.3  Iris-virginica
146          2.5          1.9  Iris-virginica
147          3.0          2.0  Iris-virginica
148          3.4          2.3  Iris-virginica
149          3.0          1.8  Iris-virginica

[150 rows x 3 columns]
```

```
data["petal_width"].mean()
```

```
1.1986666666666668
```

```
data["petal_width"].mode()[0]
```

```
0.2
```

```
data["petal_width"].mode()
```

```
0    0.2
Name: petal_width, dtype: float64
```

```
def calculate_mean(col_data):
    total = 0
    for i in col_data:
        total += i
    return (total)/len(col_data)
print(calculate_mean(data["petal_width"]))
```

```
1.1986666666666672
```

```
def calculate_median(col_data):
    ns = sorted(col_data)
    mid1, mid2 = 0, 0
    for i in range(len(ns)):
        if(len(ns)%2==0):
            mid1 = ns[(len(ns))//2]
            mid2 = ns[((len(ns))//2) - 1]
            return(mid1+mid2)//2
        else:
            return ns[len(ns)//2]
print(calculate_median(data["petal_width"]))
```

```
1.0
```

```
from collections import Counter
def calculate_mode(col_data):
    cntr = Counter(col_data)
    return max(cntr, key = cntr.get)
print(calculate_mode(data["petal_width"]))
```

```
0.2
```

```
def calculate_min(col_data):
    minval = col_data[0]
    for i in col_data:
        if i < minval:
            minval = i
    print(minval)
calculate_min(data["petal_width"])
```

```
0.1
```

```
def calculate_max(col_data):
    maxval = col_data[0]
    for i in col_data:
        if i > maxval:
            maxval = i
    print(maxval)
calculate_max(data["petal_width"])
```

```
2.5
```

```
data["class"].str.lower()
```

```
0          iris-setosa
1          iris-setosa
2          iris-setosa
3          iris-setosa
4          iris-setosa
             ...
145    iris-virginica
146    iris-virginica
147    iris-virginica
148    iris-virginica
149    iris-virginica
Name: class, Length: 150, dtype: object
```

```
data[data['class'].str.contains('Iris-setosa')]
```

	sepal_width	petal_width	class
0	3.5	0.2	Iris-setosa
1	3.0	0.2	Iris-setosa
2	3.2	0.2	Iris-setosa
3	3.1	0.2	Iris-setosa
4	3.6	0.2	Iris-setosa
5	3.9	0.4	Iris-setosa
6	3.4	0.3	Iris-setosa
7	3.4	0.2	Iris-setosa
8	2.9	0.2	Iris-setosa
9	3.1	0.1	Iris-setosa
10	3.7	0.2	Iris-setosa
11	3.4	0.2	Iris-setosa
12	3.0	0.1	Iris-setosa

```
13          3.0          0.1  Iris-setosa
14          4.0          0.2  Iris-setosa
15          4.4          0.4  Iris-setosa
16          3.9          0.4  Iris-setosa
17          3.5          0.3  Iris-setosa
18          3.8          0.3  Iris-setosa
19          3.8          0.3  Iris-setosa
20          3.4          0.2  Iris-setosa
21          3.7          0.4  Iris-setosa
22          3.6          0.2  Iris-setosa
23          3.3          0.5  Iris-setosa
24          3.4          0.2  Iris-setosa
25          3.0          0.2  Iris-setosa
26          3.4          0.4  Iris-setosa
27          3.5          0.2  Iris-setosa
28          3.4          0.2  Iris-setosa
29          3.2          0.2  Iris-setosa
30          3.1          0.2  Iris-setosa
31          3.4          0.4  Iris-setosa
32          4.1          0.1  Iris-setosa
33          4.2          0.2  Iris-setosa
34          3.1          0.1  Iris-setosa
35          3.2          0.2  Iris-setosa
36          3.5          0.2  Iris-setosa
37          3.1          0.1  Iris-setosa
38          3.0          0.2  Iris-setosa
39          3.4          0.2  Iris-setosa
40          3.5          0.3  Iris-setosa
41          2.3          0.3  Iris-setosa
42          3.2          0.2  Iris-setosa
43          3.5          0.6  Iris-setosa
44          3.8          0.4  Iris-setosa
45          3.0          0.3  Iris-setosa
46          3.8          0.2  Iris-setosa
47          3.2          0.2  Iris-setosa
48          3.7          0.2  Iris-setosa
49          3.3          0.2  Iris-setosa
```