

```
In [5]: import pandas as pd  
import numpy as np  
  
file_path = '/home/csl-4/Documents/7348/ASSIGNMENT3/Iris.csv'  
df = pd.read_csv(file_path)  
  
df.head()
```

Out[5]:		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]: # Group by Species and calculate summary statistics
summary_stats = df.groupby('Species')[['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm', 'PetalWidthCm']].mean()
print("Summary Statistics by Species:\n", summary_stats)
```

Summary Statistics by Species:											
	SepalLengthCm					SepalWidthCm					
Species		mean	median	min	max		std		mean	median	
Iris-setosa		5.006	5.0	4.3	5.8	0.352490			3.418	3.4	
Iris-versicolor		5.936	5.9	4.9	7.0	0.516171			2.770	2.8	
Iris-virginica		6.588	6.5	4.9	7.9	0.635880			2.974	3.0	
PetalLengthCm											
Species		min	max		std		mean	median	min	max	std
Iris-setosa		2.3	4.4	0.381024			1.464	1.50	1.0	1.9	0.173511
Iris-versicolor		2.0	3.4	0.313798			4.260	4.35	3.0	5.1	0.469911
Iris-virginica		2.2	3.8	0.322497			5.552	5.55	4.5	6.9	0.551895
PetalWidthCm											
Species		mean	median	min	max		std				
Iris-setosa		0.244	0.2	0.1	0.6	0.107210					
Iris-versicolor		1.326	1.3	1.0	1.8	0.197753					
Iris-virginica		2.026	2.0	1.4	2.5	0.274650					

```
In [8]: numeric_lists = {sp: df[df['Species'] == sp][['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm', 'PetalWidthCm']] for sp in df['Species'].unique()}
print("\nNumeric Lists by Species:\n", numeric_lists)
```

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Numeric Lists by Species:  
{'Iris-setosa': [[5.1, 3.5, 1.4, 0.2], [4.9, 3.0, 1.4, 0.2], [4.7, 3.2, 1.3, 0.2], [4.6, 3.1, 1.5, 0.2], [5.0, 3.6, 1.4, 0.2], [5.4, 3.9, 1.7, 0.4], [4.6, 3.4, 1.4, 0.3], [5.0, 3.4, 1.5, 0.2], [4.4, 2.9, 1.4, 0.2], [4.9, 3.1, 1.5, 0.1], [5.4, 3.7, 1.5, 0.2], [4.8, 3.4, 1.6, 0.2], [4.8, 3.0, 1.4, 0.1], [4.3, 3.0, 1.1, 0.1], [5.8, 4.0, 1.2, 0.2], [5.7, 4.4, 1.5, 0.4], [5.4, 3.9, 1.3, 0.4], [5.1, 3.5, 1.4, 0.3], [5.7, 3.8, 1.7, 0.3], [5.1, 3.8, 1.5, 0.3], [5.4, 3.4, 1.7, 0.2], [5.1, 3.7, 1.5, 0.4], [4.6, 3.6, 1.0, 0.2], [5.1, 3.3, 1.7, 0.5], [4.8, 3.4, 1.9, 0.2], [5.0, 3.0, 1.6, 0.2], [5.0, 3.4, 1.6, 0.4], [5.2, 3.5, 1.5, 0.2], [5.2, 3.4, 1.4, 0.2], [4.7, 3.2, 1.6, 0.2], [4.8, 3.1, 1.6, 0.1]]}
```

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0.2], [5.4, 3.4, 1.5, 0.4], [5.2, 4.1, 1.5, 0.1], [5.5, 4.2, 1.4, 0.2], [4.9,
3.1, 1.5, 0.1], [5.0, 3.2, 1.2, 0.2], [5.5, 3.5, 1.3, 0.2], [4.9, 3.1, 1.5,
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0.4], [4.8, 3.0, 1.4, 0.3], [5.1, 3.8, 1.6, 0.2], [4.6, 3.2, 1.4, 0.2], [5.3,
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4], [6.4, 3.2, 4.5, 1.5], [6.9, 3.1, 4.9, 1.5], [5.5, 2.3, 4.0, 1.3], [6.5,
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1.6], [6.7, 3.1, 4.7, 1.5], [6.3, 2.3, 4.4, 1.3], [5.6, 3.0, 4.1, 1.3], [5.5,
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1.3]], 'Iris-virginica': [[6.3, 3.3, 6.0, 2.5], [5.8, 2.7, 5.1, 1.9], [7.1,
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2.1], [4.9, 2.5, 4.5, 1.7], [7.3, 2.9, 6.3, 1.8], [6.7, 2.5, 5.8, 1.8], [7.2,
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2.4], [6.9, 3.1, 5.1, 2.3], [5.8, 2.7, 5.1, 1.9], [6.8, 3.2, 5.9, 2.3], [6.7,
3.3, 5.7, 2.5], [6.7, 3.0, 5.2, 2.3], [6.3, 2.5, 5.0, 1.9], [6.5, 3.0, 5.2,
2.0], [6.2, 3.4, 5.4, 2.3], [5.9, 3.0, 5.1, 1.8]]}

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In [9]:

```

for sp in df['Species'].unique():
    petal = df[df['Species']==sp]['PetalLengthCm']
    print(f"\nSpecies: {sp}")
    print("Mean:", round(petal.mean(), 2))
    print("Std Dev:", round(petal.std(), 2))
    print("25th percentile:", np.percentile(petal, 25))
    print("Median (50th percentile):", np.percentile(petal, 50))
    print("75th percentile:", np.percentile(petal, 75))

```

Species: Iris-setosa
Mean: 1.46
Std Dev: 0.17
25th percentile: 1.4
Median (50th percentile): 1.5
75th percentile: 1.5750000000000002

Species: Iris-versicolor
Mean: 4.26
Std Dev: 0.47
25th percentile: 4.0
Median (50th percentile): 4.35
75th percentile: 4.6

Species: Iris-virginica
Mean: 5.55
Std Dev: 0.55
25th percentile: 5.1

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Median (50th percentile): 5.55
75th percentile: 5.875
```

In []: