# Assignment 3

```
import pandas as pd import numpy
as np import seaborn as sns
import matplotlib.pyplot as plt
```

```
data =pd.read_csv("/content/Iris.csv")
```

```
data.head()
```

| | 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 |

Next steps: Generate code with data View recommended plots

```
data.tail()
```

| | 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 |

```
data.shape
```

```
(150, 6)
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149 Data
columns (total 6 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
0   Id             150 non-null    int64
1   SepalLengthCm  150 non-null    float64
2   SepalWidthCm   150 non-null    float64
3   PetalLengthCm  150 non-null    float64
4   PetalWidthCm   150 non-null    float64 5   Species        150 non-null
    object dtypes: float64(4), int64(1), object(1) memory usage: 7.2+ KB
```

```
data.describe()
```

| | 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 |

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

```
Id              0
```

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

```
data['SepalLengthCm'].max()
```

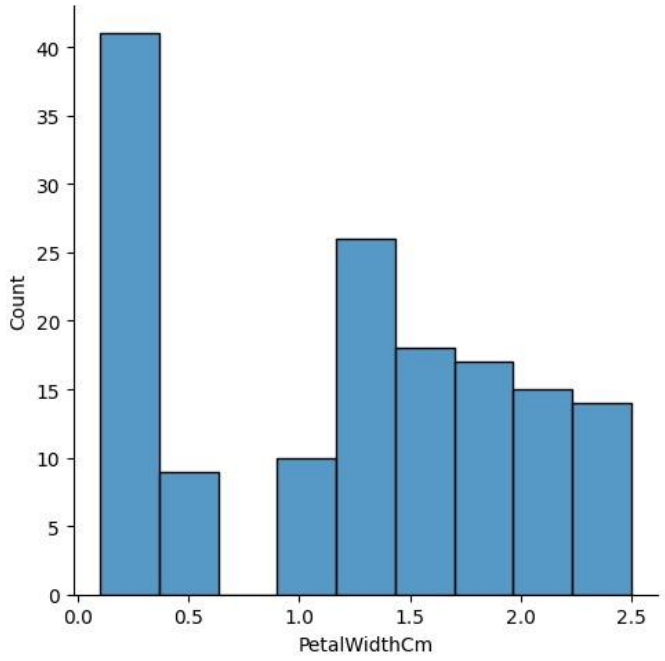
```
7.9
```

```
data.columns
```

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

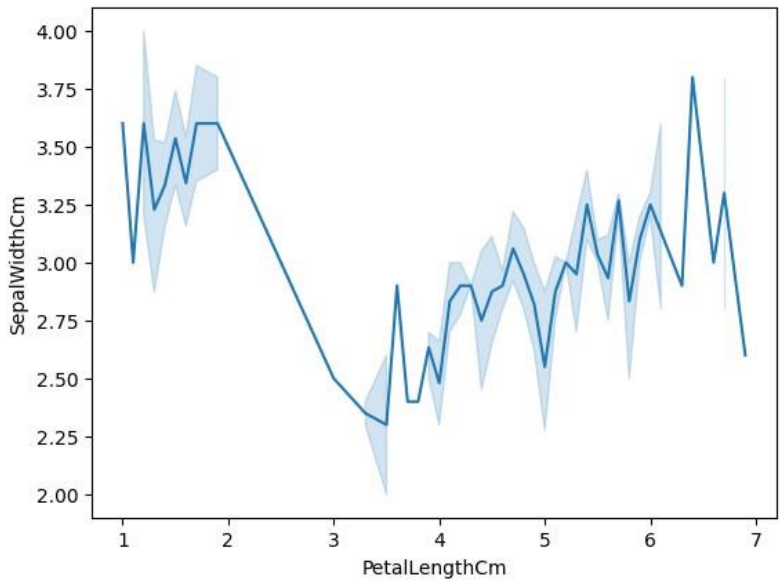
```
sns.displot(data[ 'PetalWidthCm' ])
```

```
<seaborn.axisgrid.FacetGrid at 0x7f1b86cb6200>
```



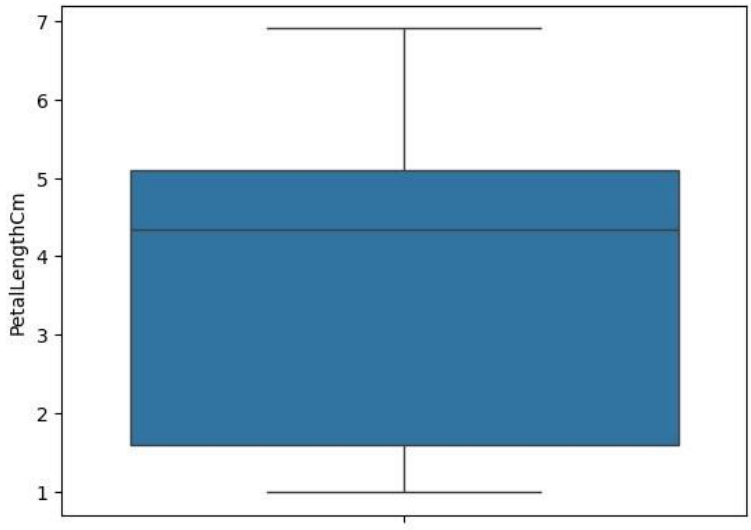

```
sns.lineplot(x=data['PetalLengthCm'],y=data['SepalWidthCm'])
```

```
<Axes: xlabel='PetalLengthCm', ylabel='SepalWidthCm'  >
```




```
sns.boxplot(data['PetalLengthCm'])
```

```
<Axes: ylabel='PetalLengthCm'>
```




```
numeric_columns=['SepalLengthCm','SepalWidthCm','PetalLengthCm','PetalWidthCm']
```

```
mean=data[numeric_columns].mean() mean
```

```
SepalLengthCm    5.843333
SepalWidthCm     3.054000
PetalLengthCm    3.758667
PetalWidthCm     1.198667
dtype: float64
```

```
median=data[numeric_columns].median() median
```

```
SepalLengthCm    5.80
SepalWidthCm     3.00
PetalLengthCm    4.35
PetalWidthCm     1.30
dtype: float64
```

```
mode=data[numeric_columns].mode() mode
```

| | SepalLengthCm | SepalWidthCm | PetalLengthCm | PetalWidthCm |
|---|---|---|---|---|
| **0** | 5.0 | 3.0 | 1.5 | 0.2 |

```
x=data.drop('Species',axis=1)
```

```
y=data['Species']
```

```
from sklearn.model_selection import train_test_split
```

```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2,random_state=12)
```

```
from sklearn import svm
```

```
model=svm.SVC(kernel='linear')
```

```
model=model.fit(x_train,y_train)
```

```
predict=model.predict(x_test)
```

```
from sklearn import metrics
metrics.accuracy_score(predict,y_test)
```

```
1.0
```

```
from sklearn import svm
```

```
model=svm.SVC(kernel='poly') Model=model.fit(x_train,y_train)
```

```
predict=Model.predict(x_test)
```

```
predict
```

```
array(['Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-versicolor',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-versicolor',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-virginica', 'Iris-versicolor',
       'Iris-setosa', 'Iris-versicolor', 'Iris-setosa', 'Iris-versicolor',
       'Iris-virginica', 'Iris-versicolor', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-versicolor',        'Iris-
  setosa', 'Iris-setosa'], dtype=object)
```

```
metrics.accuracy_score(predict,y_test)
```

```
0.9666666666666667
```