In [2]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

Q1. Data Visualization and Statistical Measures:

For this question, you are required to analyse the iris dataset (iris.csv) using Python. Perform all possible data visualization techniques (histograms, scatter plots, box plots, etc.) on all numerical columns of the dataset. Additionally, calculate all possible statistical measures (mean, median, mode, standard deviation, etc.) for each numerical column.

In [7]:
```
data=pd.read_csv(r"C:\Users\AHILYA\Downloads\Iris.csv")
data
```

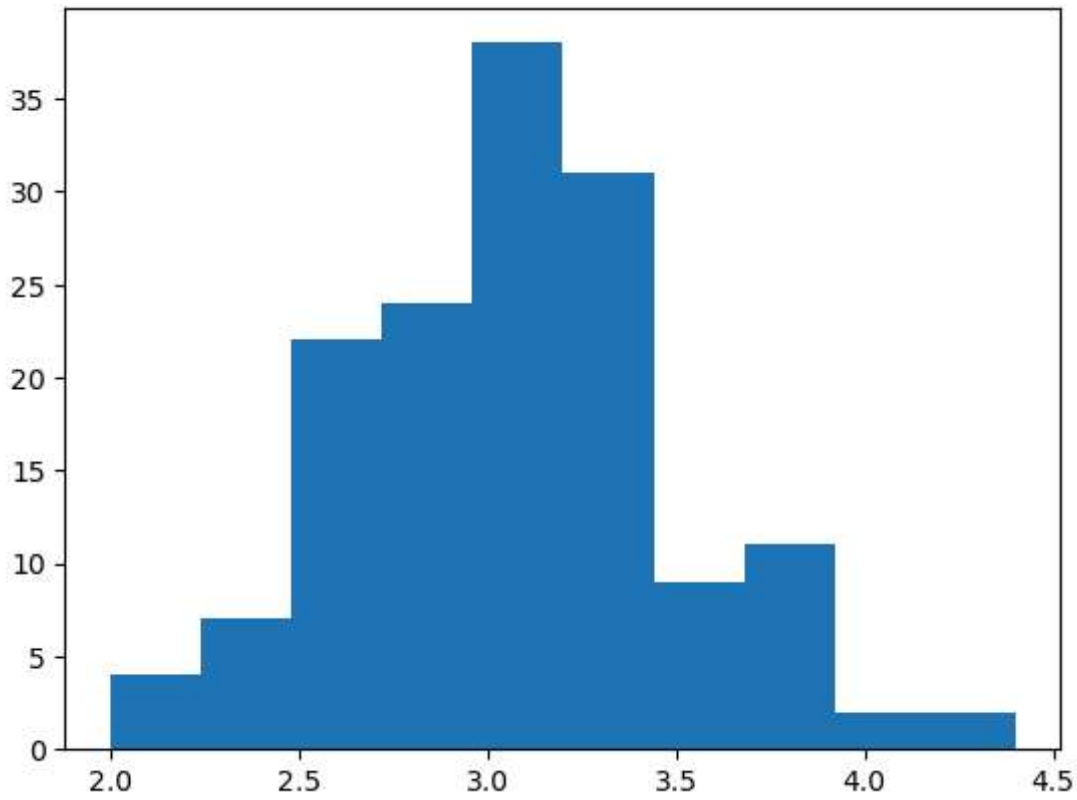
Out[7]:

	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

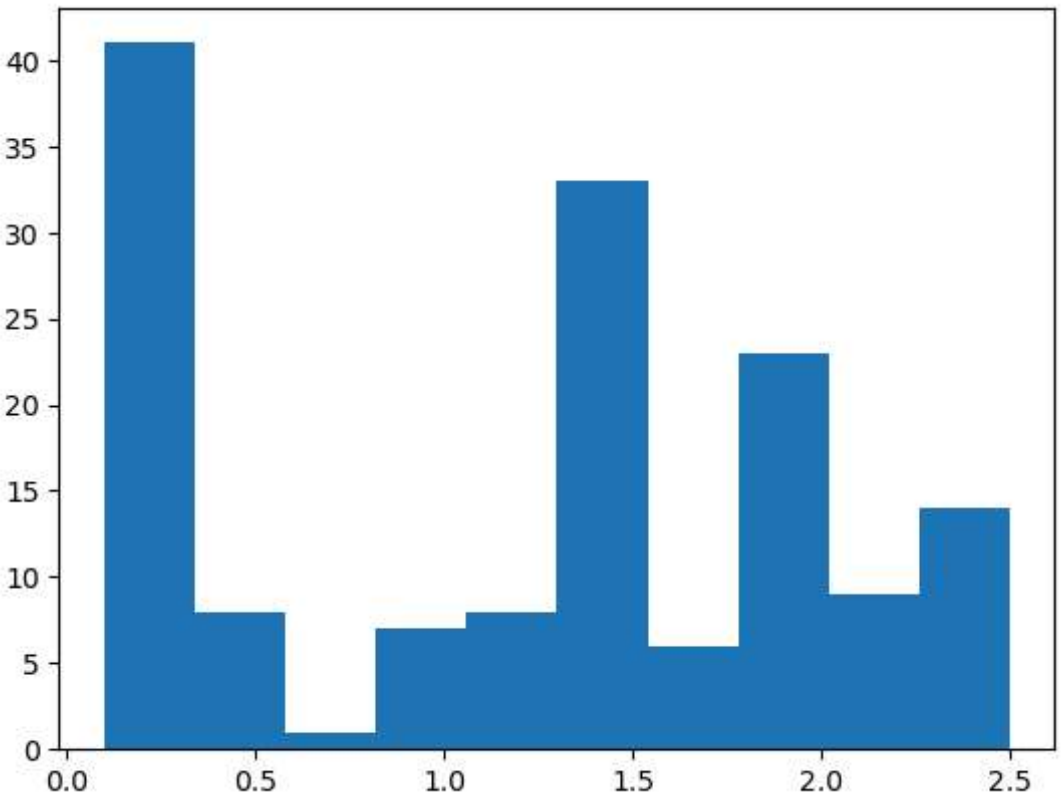
In [8]:
```
plt.hist(data["SepalWidthCm"])
```

Out[8]:
```
(array([ 4.,  7., 22., 24., 38., 31.,  9., 11.,  2.,  2.]),
 array([2.  , 2.24, 2.48, 2.72, 2.96, 3.2 , 3.44, 3.68, 3.92, 4.16, 4.4
]),
 <BarContainer object of 10 artists>)
```



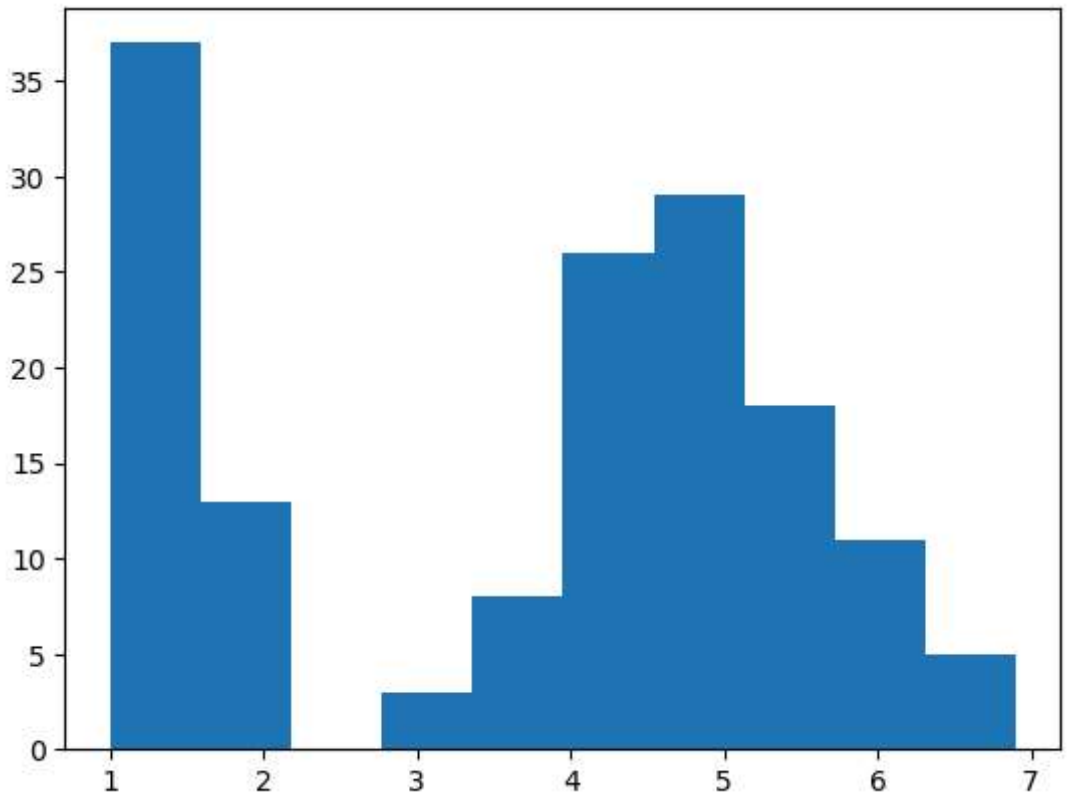
In [9]:
```
plt.hist(data["PetalWidthCm"])
```

Out[9]:
```
(array([41.,  8.,  1.,  7.,  8., 33.,  6., 23.,  9., 14.]),
 array([0.1 , 0.34, 0.58, 0.82, 1.06, 1.3 , 1.54, 1.78, 2.02, 2.26, 2.5
]),
 <BarContainer object of 10 artists>)
```



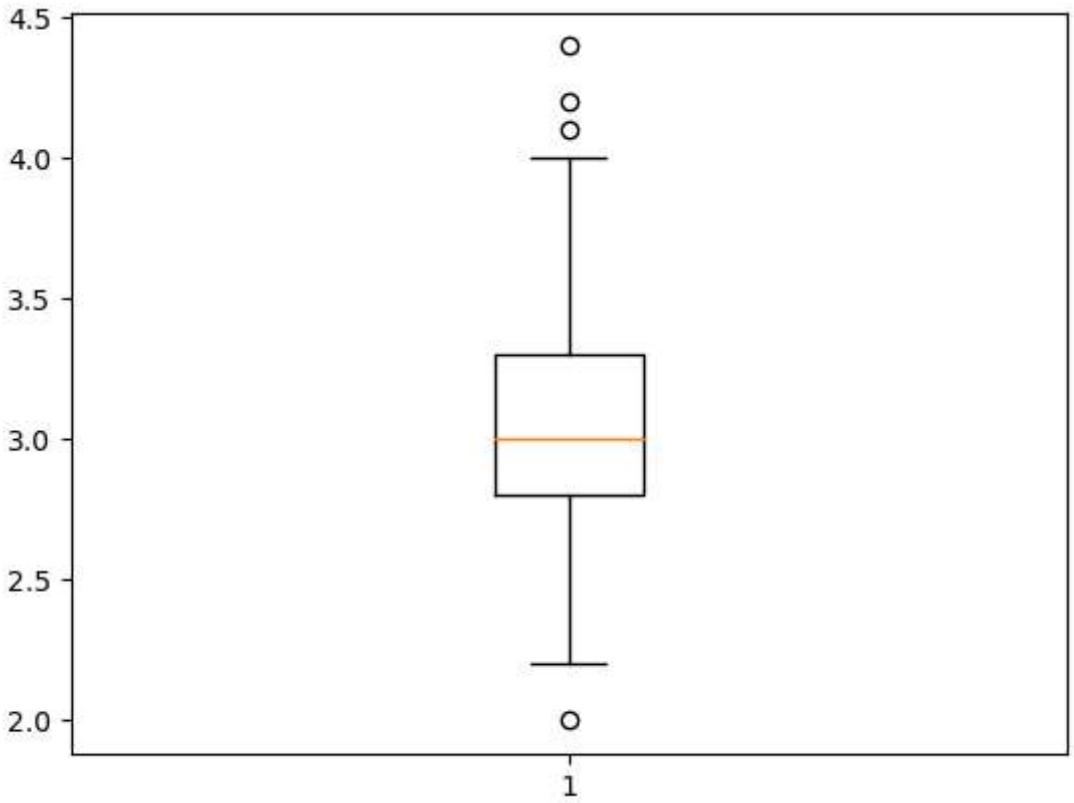
In [10]:
```
plt.hist(data["PetalLengthCm"])
```

Out[10]:
```
(array([37., 13.,  0.,  3.,  8., 26., 29., 18., 11.,  5.]),
 array([1.  , 1.59, 2.18, 2.77, 3.36, 3.95, 4.54, 5.13, 5.72, 6.31, 6.9
]),
 <BarContainer object of 10 artists>)
```



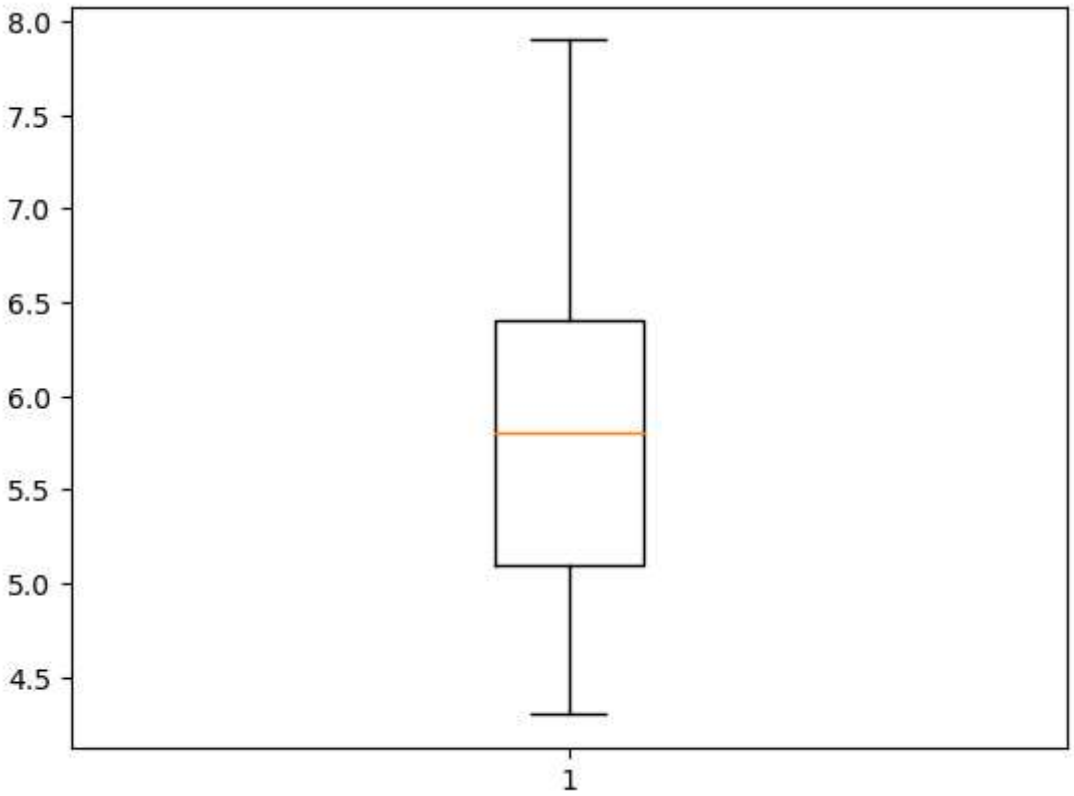
In [11]:
```
plt.boxplot(data["SepalWidthCm"])
```

Out[11]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x1be57d22bd0>,
  <matplotlib.lines.Line2D at 0x1be57bac810>],
 'caps': [<matplotlib.lines.Line2D at 0x1be57bad150>,
  <matplotlib.lines.Line2D at 0x1be57bad9d0>],
 'boxes': [<matplotlib.lines.Line2D at 0x1be57b46990>],
 'medians': [<matplotlib.lines.Line2D at 0x1be57bae210>],
 'fliers': [<matplotlib.lines.Line2D at 0x1be57bae950>],
 'means': []}
```



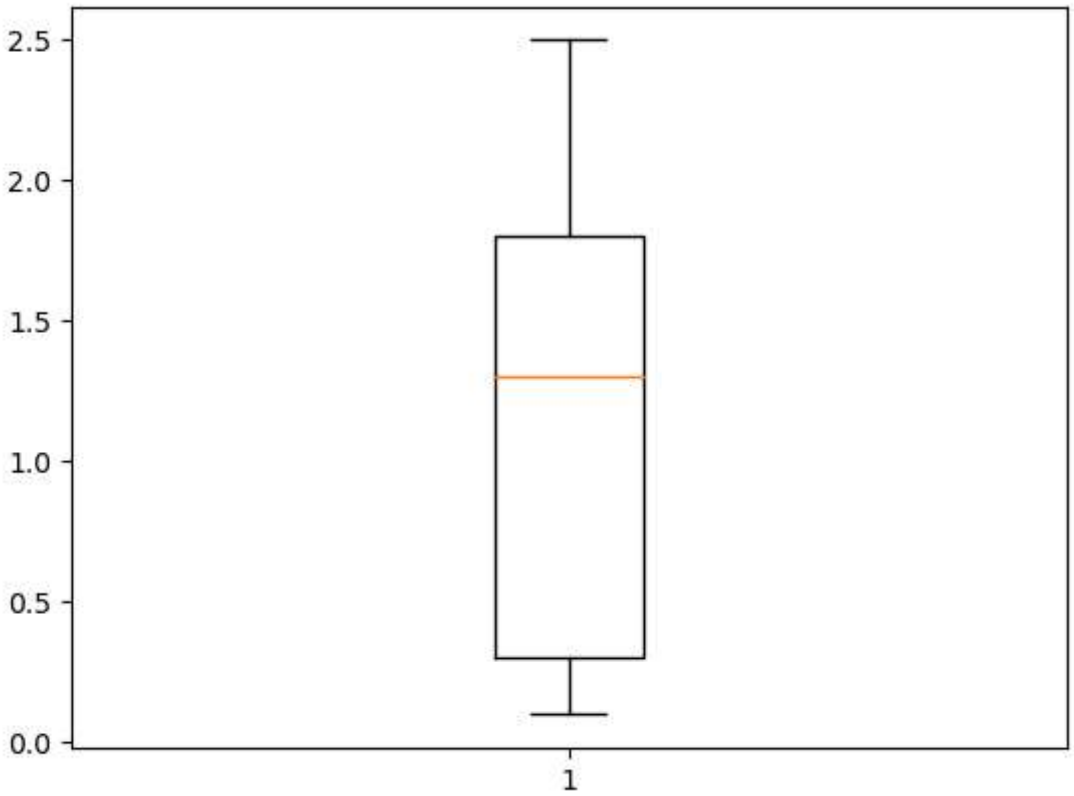
In [12]:
```
plt.boxplot(data["SepalLengthCm"])
```

Out[12]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x1be57d42f90>,
  <matplotlib.lines.Line2D at 0x1be57d43910>],
 'caps': [<matplotlib.lines.Line2D at 0x1be57d542d0>,
  <matplotlib.lines.Line2D at 0x1be57d54bd0>],
 'boxes': [<matplotlib.lines.Line2D at 0x1be57d427d0>],
 'medians': [<matplotlib.lines.Line2D at 0x1be57d55490>],
 'fliers': [<matplotlib.lines.Line2D at 0x1be57d33290>],
 'means': []}
```



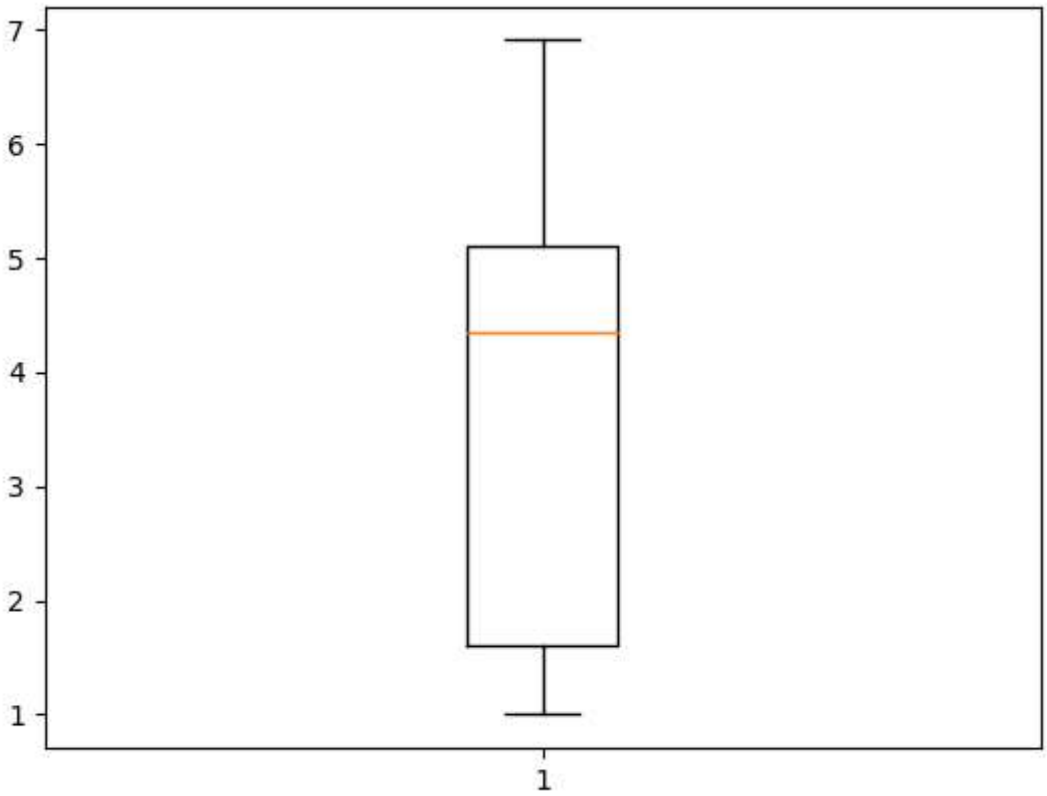
In [13]:
```
plt.boxplot(data["PetalWidthCm"])
```

Out[13]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x1be57dae850>,
  <matplotlib.lines.Line2D at 0x1be57daf210>],
 'caps': [<matplotlib.lines.Line2D at 0x1be57dafc10>,
  <matplotlib.lines.Line2D at 0x1be57dbc4d0>],
 'boxes': [<matplotlib.lines.Line2D at 0x1be57dadf90>],
 'medians': [<matplotlib.lines.Line2D at 0x1be57dbcd50>],
 'fliers': [<matplotlib.lines.Line2D at 0x1be57dbd550>],
 'means': []}
```



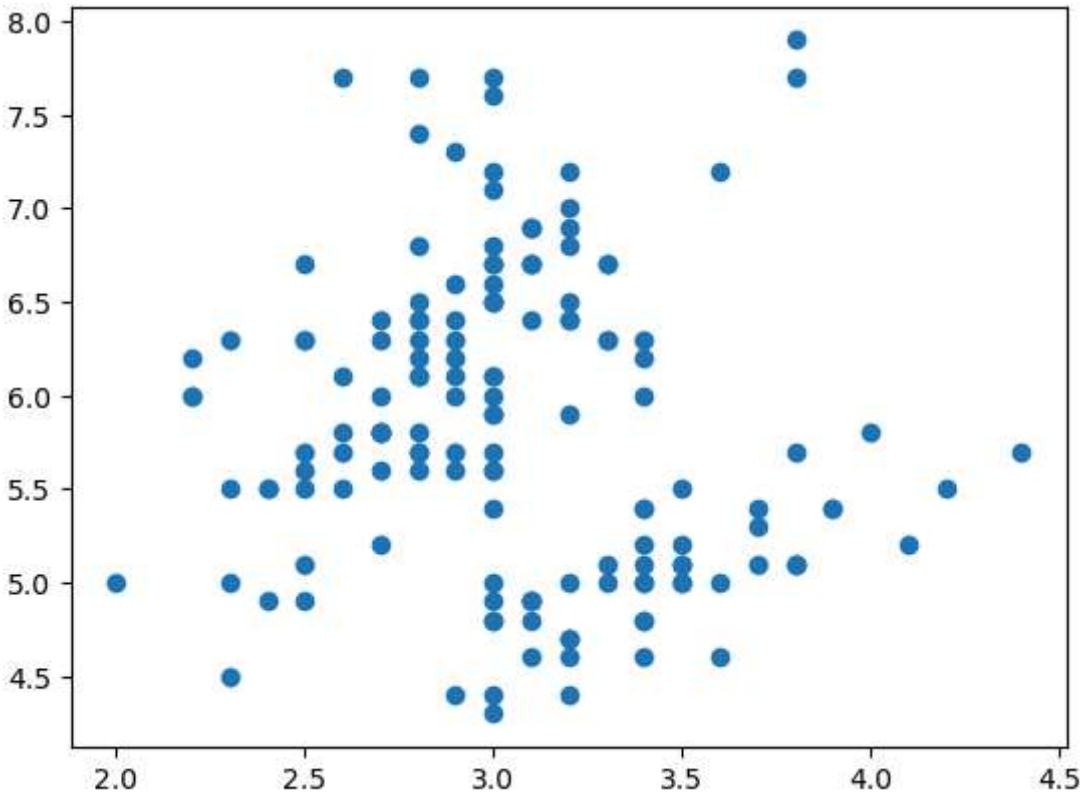
In [14]:
```
plt.boxplot(data["PetalLengthCm"])
```

Out[14]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x1be57e166d0>,
  <matplotlib.lines.Line2D at 0x1be57e17310>],
 'caps': [<matplotlib.lines.Line2D at 0x1be57e17c50>,
  <matplotlib.lines.Line2D at 0x1be57e28710>],
 'boxes': [<matplotlib.lines.Line2D at 0x1be57e159d0>],
 'medians': [<matplotlib.lines.Line2D at 0x1be57e29210>],
 'fliers': [<matplotlib.lines.Line2D at 0x1be57e179d0>],
 'means': []}
```



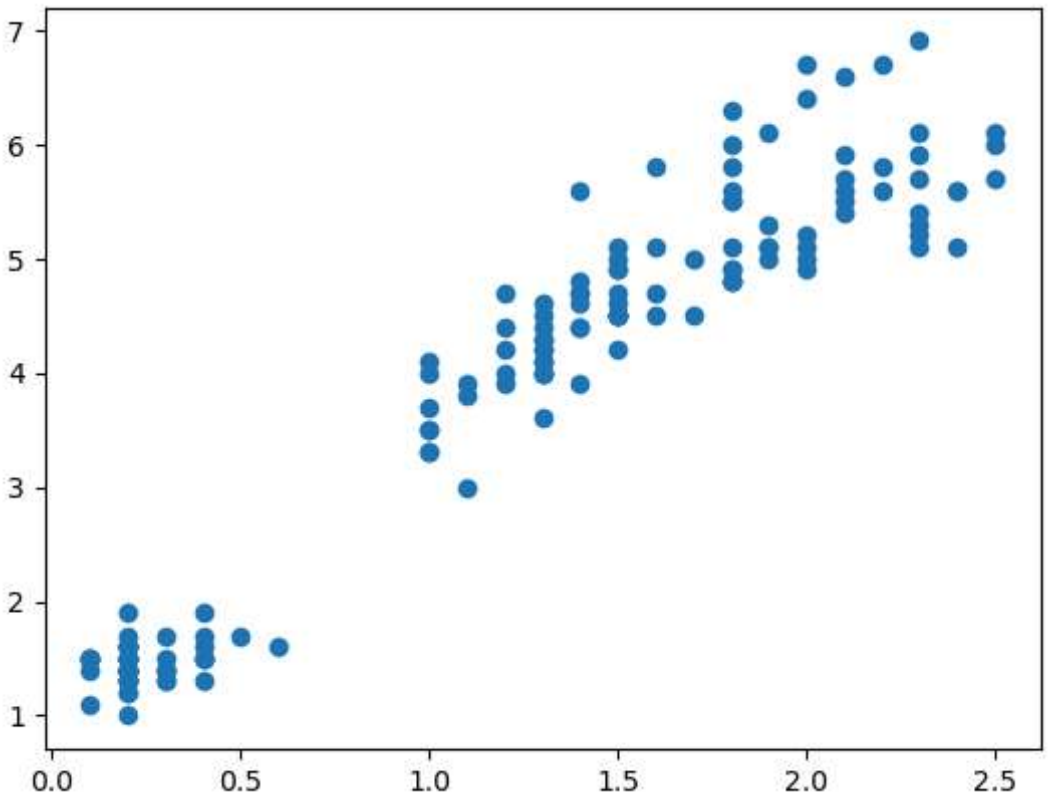
In [15]:
```
plt.scatter(data["SepalWidthCm"],data["SepalLengthCm"])
```

Out[15]:
```
<matplotlib.collections.PathCollection at 0x1be57bc7fd0>
```



In [16]:
```
plt.scatter(data["PetalWidthCm"],data["PetalLengthCm"])
```

Out[16]:
```
<matplotlib.collections.PathCollection at 0x1be57e5bc10>
```



In [17]:
```
plt.pie(data["PetalWidthCm"])
plt.show
```

Out[17]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```

In [18]:
```
print(data["SepalLengthCm"].mean())
print(data["SepalWidthCm"].mean())
print(data["PetalLengthCm"].mean())
print(data["PetalWidthCm"].mean())
```

```
5.843333333333334
3.0540000000000003
3.758666666666666
1.1986666666666668
```

In [19]:
```
print(data["SepalLengthCm"].mean())
print(data["SepalWidthCm"].mean())
print(data["PetalLengthCm"].mean())
print(data["PetalWidthCm"].mean())
print(data["SepalLengthCm"].mode())
print(data["SepalWidthCm"].mode())
print(data["PetalLengthCm"].mode())
print(data["PetalWidthCm"].mode())
```

```
5.843333333333334
3.0540000000000003
3.758666666666666
1.1986666666666668
0    5.0
Name: SepalLengthCm, dtype: float64
0    3.0
Name: SepalWidthCm, dtype: float64
0    1.5
Name: PetalLengthCm, dtype: float64
0    0.2
Name: PetalWidthCm, dtype: float64
```

In [20]:
```
print(data["SepalLengthCm"].median())
print(data["SepalWidthCm"].median())
print(data["PetalLengthCm"].median())
print(data["PetalWidthCm"].median())
```

```
5.8
3.0
4.35
1.3
```

In [21]:
```
data.describe()
```

Out[21]:

	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 [22]:
```
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
```

In [ ]:
```

```