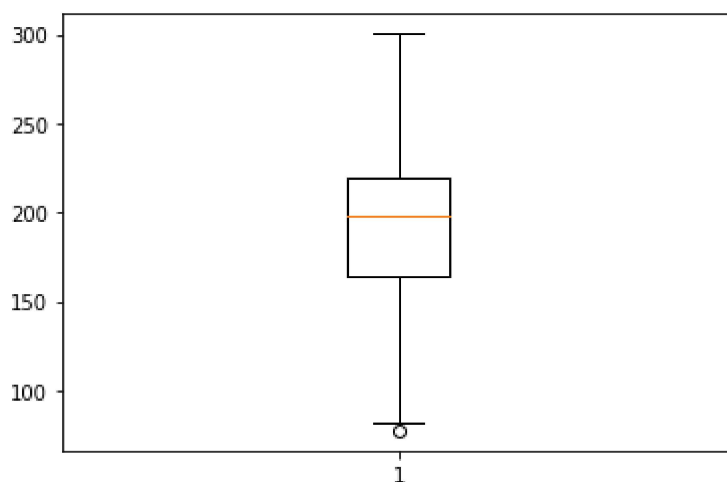
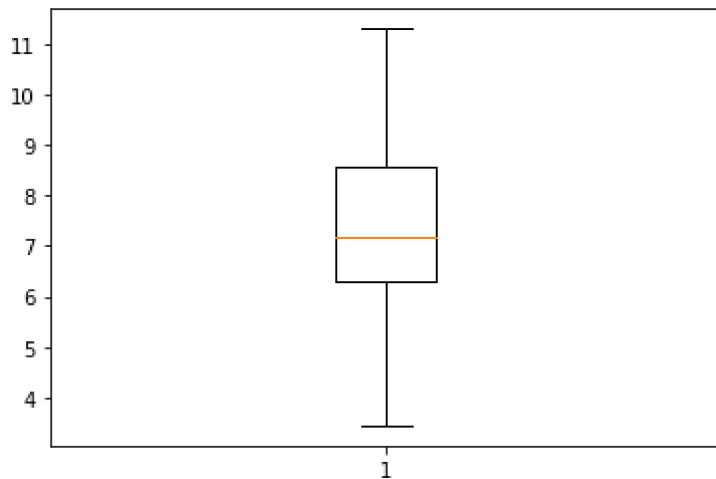


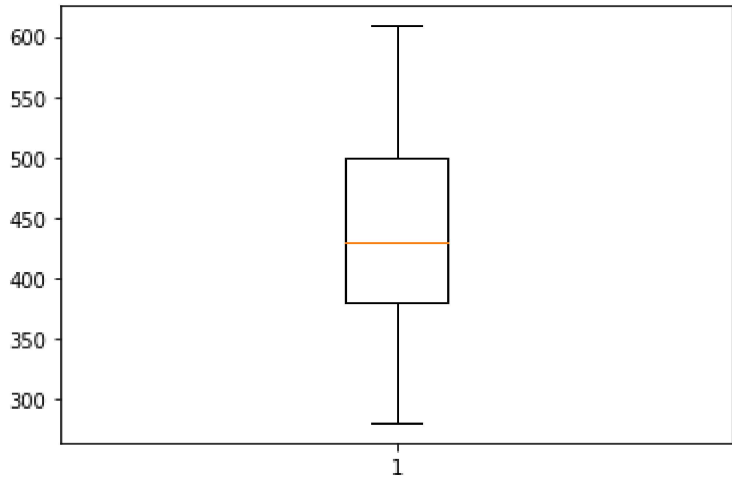
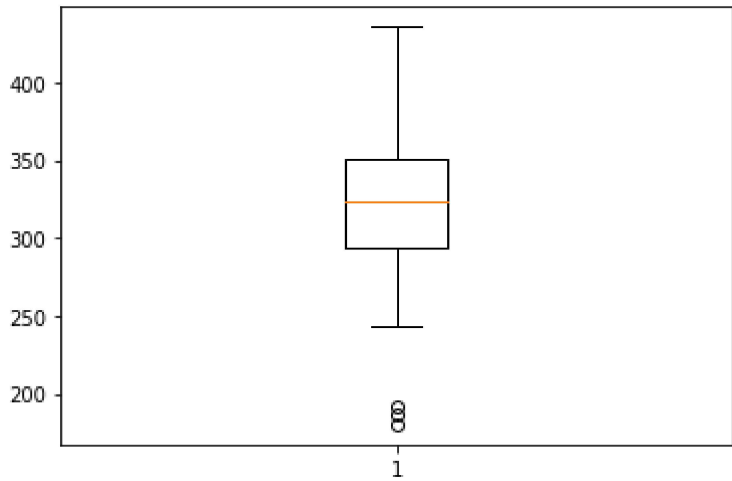
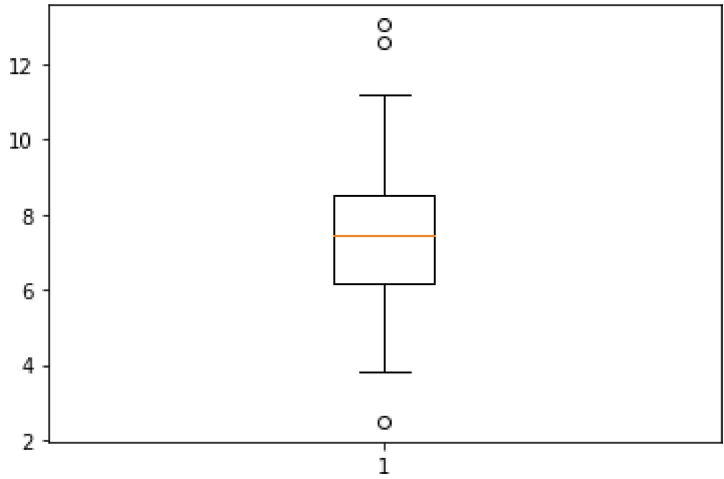
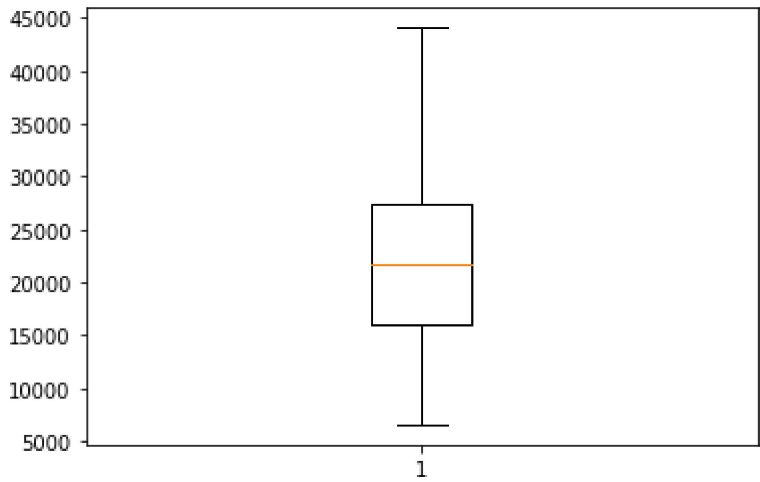
```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans, AgglomerativeClustering
from sklearn.metrics import silhouette_samples, silhouette_score
from sklearn.metrics import davies_bouldin_score
from sklearn.metrics import calinski_harabasz_score
from pandas.plotting import andrews_curves
from pandas.plotting import parallel_coordinates

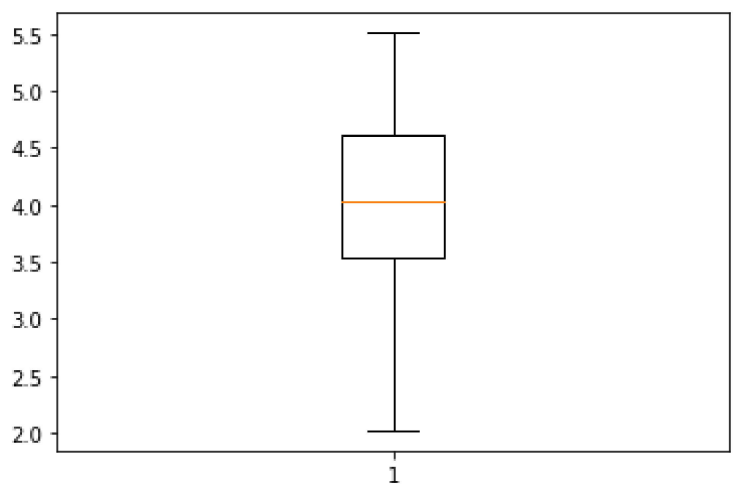
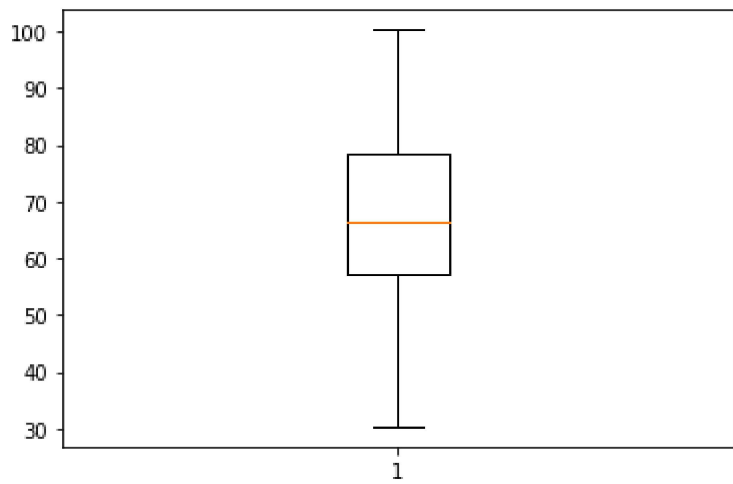
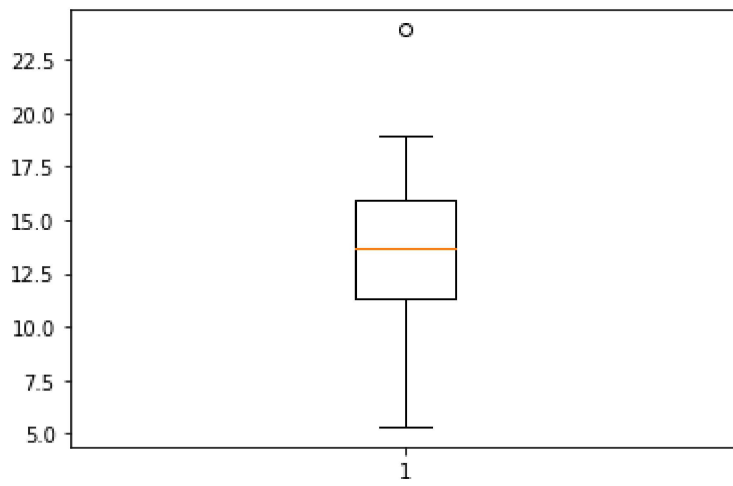
import seaborn as sns
```

```
In [2]: ClassTestData3 = np.loadtxt(r'ClassTestData3.csv', delimiter=",")
data = ClassTestData3[:, 1:ClassTestData3.shape[1]]
label = ClassTestData3[:, 0]

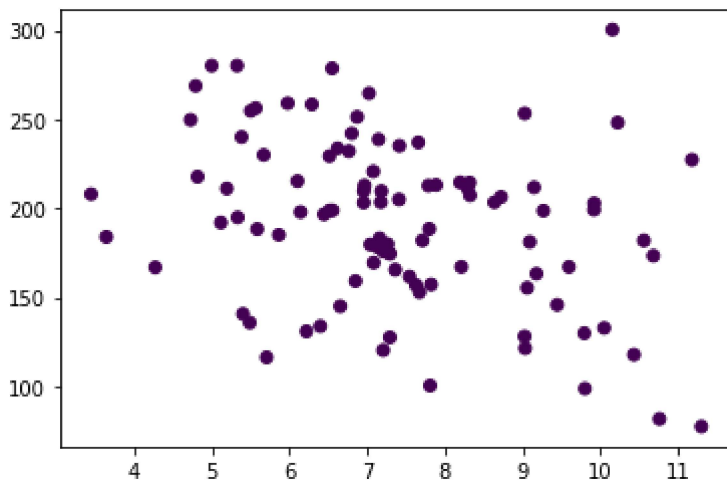
for i in range(0, data.shape[1]):
    ax = plt.subplot()
    ax.boxplot(data[:, i], showfliers=True)
    plt.show()
```



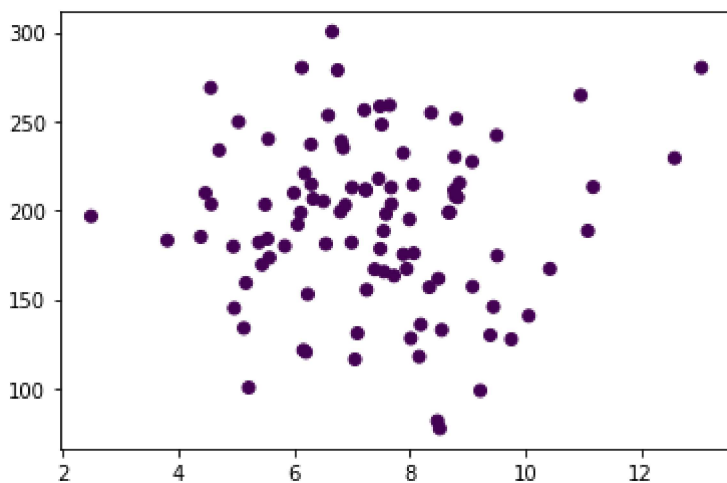




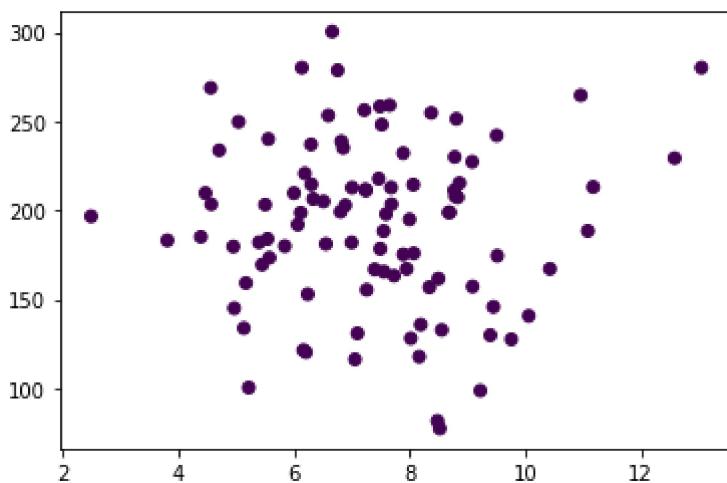
```
In [3]: from sklearn.cluster import DBSCAN
dbscan_model0 = DBSCAN(eps=0.2, min_samples=5)
y_pred = dbscan_model0.fit_predict(data)
plt.scatter(data[:,0], data[:,1], c=y_pred)
plt.show()
```



```
In [4]: dbscan_model1 = DBSCAN(eps=0.5, min_samples=3)
y_pred = dbscan_model1.fit_predict(data)
plt.scatter(data[:, 3], data[:, 1], c=y_pred)
plt.show()
```



```
In [5]: dbscan_model2 = DBSCAN(eps=0.7, min_samples=3).fit(data)
y_pred = dbscan_model2.labels_
plt.scatter(data[:, 3], data[:, 1], c=y_pred)
plt.show()
```



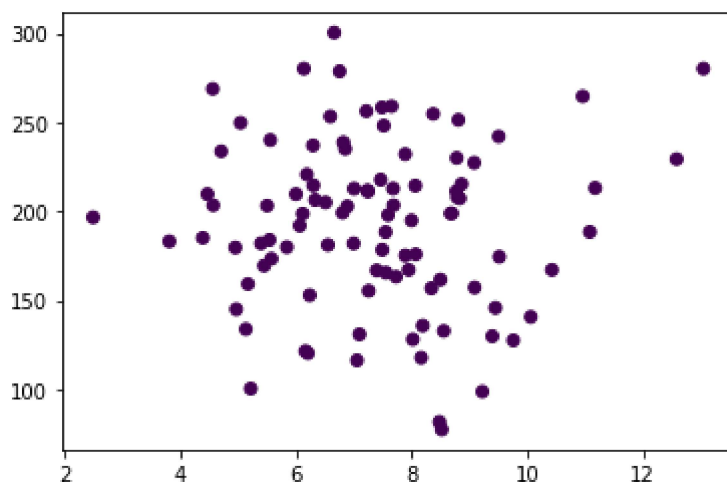
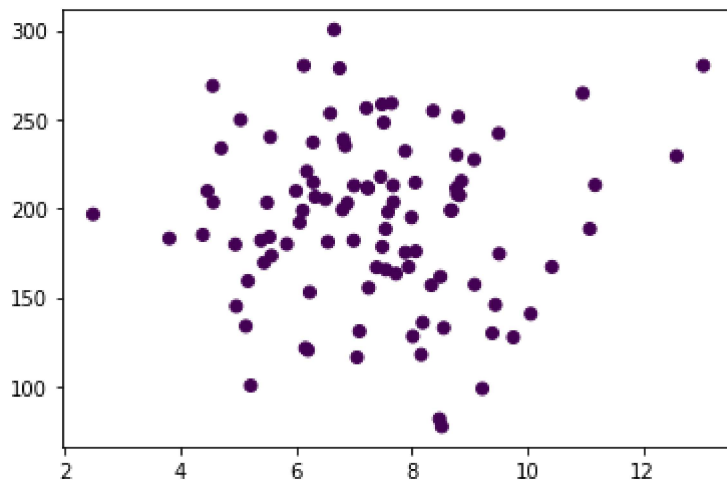
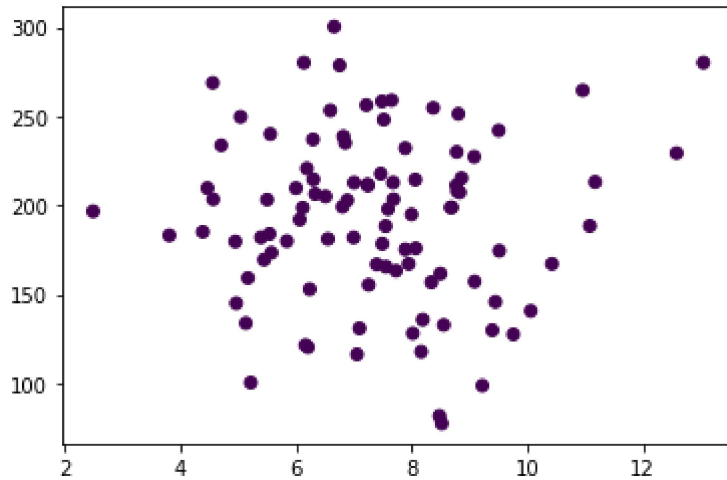
```
In [6]: eps = [0.1, 0.5, 0.7]

pred = []
```

```

for i in range(0,3):
    dbscan_model = DBSCAN(eps=eps[i], min_samples=5)
    y_pred = dbscan_model.fit_predict(data)
    pred.append(y_pred)
    plt.scatter(data[:, 3], data[:, 1], c=y_pred)
    plt.show()

```



In []:

```

for p in pred:
    silhouette_avg = silhouette_score(data, p)
    print("The average silhouette_score is:", silhouette_avg)

    davies_bouldin_avg = davies_bouldin_score(data, p)
    print("The average davies_bouldin_score is:", davies_bouldin_avg)

    calinski_harabasz_avg = calinski_harabasz_score(data, p)
    print("The average calinski_harabasz_score is:", calinski_harabasz_avg)

```

