In [2]:
```
import pandas as pd
import numpy as np
from matplotlib import pyplot as plt
from sklearn.cluster import AgglomerativeClustering
import scipy.cluster.hierarchy as sch
```

```
from sklearn.datasets import load_iris
iris = load_iris()
features=iris.data.T
plt.plot()
plt.scatter(features[0], features[1])
plt.show()
```

```
X = np.array(list(zip(features[0], features[1]))).reshape(len(features[1]), 2)
dendrogram = sch.dendrogram(sch.linkage(X, method='average'))
```

In [31]:
```
model = AgglomerativeClustering(n_clusters=3, affinity='euclidean', linkage='average')
model.fit(X)
labels = model.labels_
```

```
labels
```

```
plt.scatter(X[labels==0, 0], X[labels==0, 1], s=50, marker='o', color='red')
plt.scatter(X[labels==1, 0], X[labels==1, 1], s=50, marker='o', color='blue')
plt.scatter(X[labels==2, 0], X[labels==2, 1], s=50, marker='o', color='green')
plt.scatter(X[labels==3, 0], X[labels==3, 1], s=50, marker='o', color='purple')
plt.scatter(X[labels==4, 0], X[labels==4, 1], s=50, marker='o', color='orange')
plt.show()
```

```
model = AgglomerativeClustering(n_clusters=3, affinity='euclidean', linkage='single')
model.fit(X)
labels = model.labels_
plt.scatter(X[labels==0, 0], X[labels==0, 1], s=50, marker='o', color='red')
plt.scatter(X[labels==1, 0], X[labels==1, 1], s=50, marker='o', color='blue')
plt.scatter(X[labels==2, 0], X[labels==2, 1], s=50, marker='o', color='green')
plt.scatter(X[labels==3, 0], X[labels==3, 1], s=50, marker='o', color='purple')
plt.scatter(X[labels==4, 0], X[labels==4, 1], s=50, marker='o', color='orange')
plt.show()
```

```
model = AgglomerativeClustering(n_clusters=3, affinity='euclidean', linkage='complete')
model.fit(X)
labels = model.labels_
plt.scatter(X[labels==0, 0], X[labels==0, 1], s=50, marker='o', color='red')
plt.scatter(X[labels==1, 0], X[labels==1, 1], s=50, marker='o', color='blue')
plt.scatter(X[labels==2, 0], X[labels==2, 1], s=50, marker='o', color='green')
plt.scatter(X[labels==3, 0], X[labels==3, 1], s=50, marker='o', color='purple')
plt.scatter(X[labels==4, 0], X[labels==4, 1], s=50, marker='o', color='orange')
plt.show()
```

```
model = AgglomerativeClustering(n_clusters=3, affinity='euclidean', linkage='ward')
model.fit(X)
labels = model.labels_
plt.scatter(X[labels==0, 0], X[labels==0, 1], s=50, marker='o', color='red')
plt.scatter(X[labels==1, 0], X[labels==1, 1], s=50, marker='o', color='blue')
plt.scatter(X[labels==2, 0], X[labels==2, 1], s=50, marker='o', color='green')
plt.scatter(X[labels==3, 0], X[labels==3, 1], s=50, marker='o', color='purple')
plt.scatter(X[labels==4, 0], X[labels==4, 1], s=50, marker='o', color='orange')
plt.show()
```