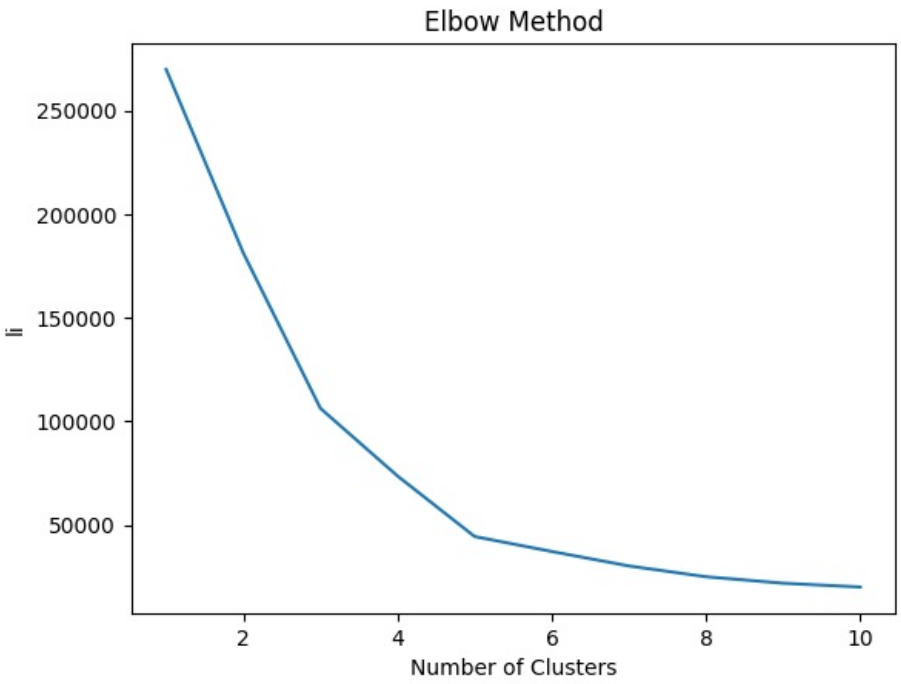
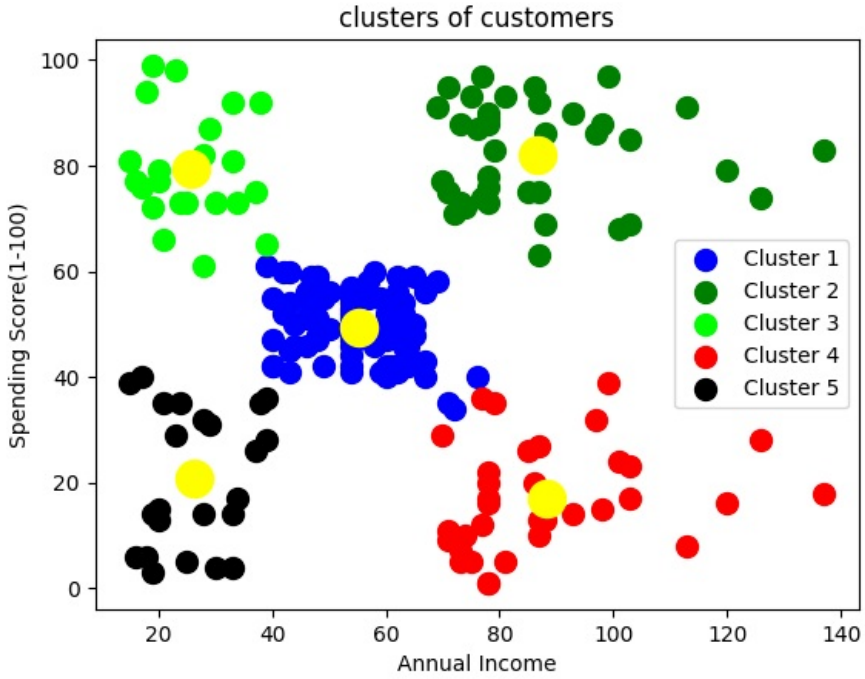
55. K-means [using Mall Customers Data]

In [7]:
```
import pandas as p
import matplotlib.pyplot as m
da=p.read_csv("Mall_Customers.csv")
x=da.iloc[:,[3,4]].values
from sklearn.cluster import KMeans
li=[]

for i in range(1,11):
    mod=KMeans(n_clusters=i,init='k-means++', random_state=42,n_init=10)
    mod.fit(x)
    li.append(mod.inertia_)

m.plot(range(1,11), li)
m.title("Elbow Method")
m.xlabel('Number of Clusters'); m.ylabel('li'); m.show()

mod=KMeans(n_clusters=5,init='k-means++', random_state=42,n_init=10)
y_pred=mod.fit_predict(x)

m.scatter(x[y_pred==0,0],x[y_pred==0,1],s=100, c='blue', label='Cluster 1')
m.scatter(x[y_pred==1,0],x[y_pred==1,1],s=100,c='g', label='Cluster 2')
m.scatter(x[y_pred==2,0],x[y_pred==2,1],s=100, c='lime', label='Cluster 3')
m.scatter(x[y_pred==3,0],x[y_pred==3,1],s=100, c='red', label='Cluster 4')
m.scatter(x[y_pred==4,0],x[y_pred==4,1],s=100, c='k', label='Cluster 5')
m.scatter (mod.cluster_centers_[:,0],mod.cluster_centers_[:,1],s=300,c='yellow')
m.title("clusters of customers")
m.xlabel("Annual Income"); m.ylabel("Spending Score(1-100)")
m.legend();m.show()
```





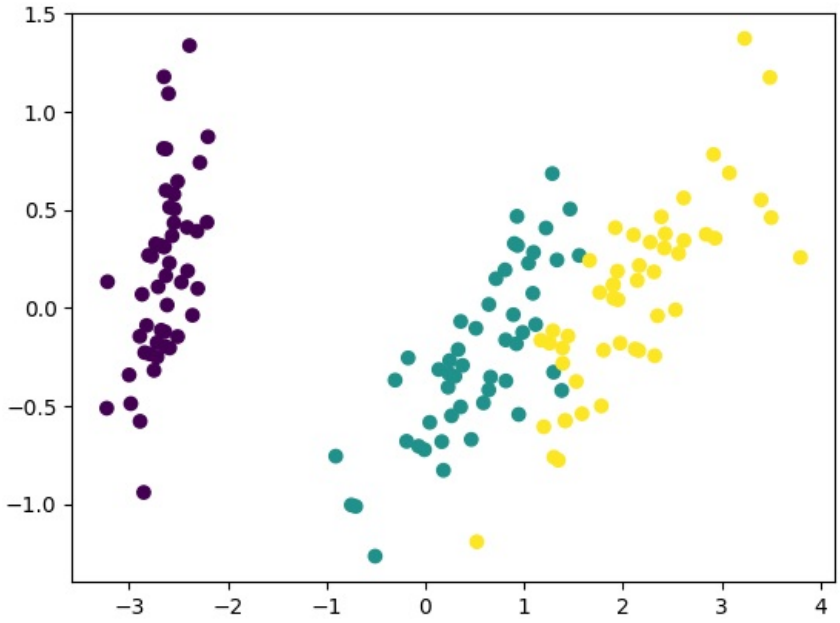
56. Dimensionality Reduction [PCA] using iris Dataset

In [2]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn import datasets
from sklearn.decomposition import PCA

iris=datasets.load_iris()
x=iris.data
y=iris.target
print(x.shape)
print(y.shape)

pca=PCA(n_components=2)
pca.fit(x)
print(pca.components_)

x=pca.transform(x)
print(x.shape)
plt.scatter (x[:,0],x[:,1],c=y)

from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score

x_train, x_test,y_train,y_test=train_test_split(x,y,test_size=0.2)
res=DecisionTreeClassifier()
res.fit(x_train,y_train)

y_predict=res.predict(x_test)
```

```
print('accuracy score',accuracy_score (y_test,y_predict))
```

```
(150, 4)
(150,)
[[ 0.36138659 -0.08452251  0.85667061  0.3582892 ]
 [ 0.65658877  0.73016143 -0.17337266 -0.07548102]]
(150, 2)
accuracy score 0.9333333333333333
```



In [ ]: