

K MEANS CLUSTERING

CODE:

```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
data = {
    'Sales':[30,55,95,30,35,60,77,46,81,70],
    'Score':[89,66,54,52,99,65,86,50,89,78]
}
df = pd.DataFrame(data)
kmeans = KMeans(n_clusters=3, random_state=42)
kmeans.fit(df)
df['Cluster'] = kmeans.labels_
print("Cluster Centers:\n", kmeans.cluster_centers_)
print("\nData with Cluster Labels:\n", df)
plt.figure(figsize=(8,6))
plt.scatter(df['Sales'], df['Score'], c=df['Cluster'], cmap='cool', s=100, label='Sales')
centroids = kmeans.cluster_centers_
plt.scatter(centroids[:, 0], centroids[:, 1], c='red', s=200, marker='X', label='Centroids')
plt.title('K-Means Clustering: Sales vs score')
plt.xlabel(' Sales')
plt.ylabel('score')
plt.legend()
plt.show()
```

OUTPUT:

```
PS E:\DATA SCIENCE> & E:/Python/python.exe "e:/DATA SCIENCE/week4/kmeans.py"
Cluster Centers:
[[38. 51. ]
 [73. 73. ]
 [32.5 94. ]]

Data with Cluster Labels:
   Sales Score  Cluster
0     30    89        2
1     55    66        1
2     95    54        1
3     30    52        0
4     35    99        2
5     60    65        1
6     77    86        1
7     46    58        0
8     81    89        1
9     70    78        1

          
```



```
4     35    99        2
5     60    65        1
6     77    86        1
7     46    58        0
8     81    89        1
9     70    78        1
```

4	35	99	2
5	60	65	1
6	77	86	1
7	46	58	0
8	81	89	1
9	70	78	1
4	35	99	2
5	60	65	1
6	77	86	1
7	46	58	0
8	81	89	1
9	35	99	2
5	60	65	1
6	77	86	1
4	35	99	2
5	60	65	1
4	35	99	2
4	35	99	2
4	35	99	2
5	60	65	1
6	77	86	1
7	46	58	0
8	81	89	1
4	35	99	2
5	60	65	1
6	77	86	1
7	46	58	0
8	81	89	1
9	70	78	1

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	PORTS
5	60	65	1	
6	77	86	1	
7	46	50	0	
8	81	89	1	
9	70	78	1	
4	35	99	2	
5	60	65	1	
6	77	86	1	
7	46	50	0	
8	81	89	1	
9	70	78	1	
4	35	99	2	
5	60	65	1	
6	77	86	1	
7	46	50	0	
8	81	89	1	
9	70	78	1	
4	35	99	2	
5	60	65	1	
6	77	86	1	
7	46	50	0	

