|  |  |
| --- | --- |
|  | **EXP.NO: 7**  **DATE: 06-09-2023** |
| **Aim:** Implement K-Means\_Clustering using python  **ALGORITHM**:  Step 1: Read the Given data Sample to X  Step 2: Train Dataset with K=5  Step 3: Find optimal number of clusters(k) in a dataset using Elbow method  Step 4: Train Dataset with K=3 (optimal K-Value)  Step 5: Compare results  Step 6: End  **Program:**  # Import libraries  import numpy as np  import pandas as pd  import matplotlib.pyplot as plt  from sklearn.cluster import KMeans  from sklearn import datasets  import warnings  # Suppress warnings  warnings.filterwarnings("ignore")  # Read DataSet  df = datasets.load\_iris()  x = df.data  y = df.target  # Let's try with k=5 initially  kmeans5 = KMeans(n\_clusters=5)  y\_kmeans5 = kmeans5.fit\_predict(x)  print(y\_kmeans5)  print(kmeans5.cluster\_centers\_)  # To find the optimal number of clusters (k) in a dataset  Error = []    for i in range(1, 11):  kmeans = KMeans(n\_clusters=i).fit(x)  kmeans.fit(x)  Error.append(kmeans.inertia\_)  import matplotlib.pyplot as plt  plt.plot(range(1, 11), Error)  plt.title('Elbow method')  plt.xlabel('No of clusters')  plt.ylabel('Error')  plt.show()  # Now try with k=3 finally  kmeans3 = KMeans(n\_clusters=3)  y\_kmeans3 = kmeans3.fit\_predict(x)  print(y\_kmeans3)  print(kmeans3.cluster\_centers\_)  **Output:** | |