# **GLS University**

## **Faculty of Computer Applications & Information Technology**

## **Machine Learning**

## **Practical Notes**

## **Unit4**

**K means of Clustering**

| **Demo Code:**  import numpy as np  import matplotlib.pyplot as plt  from sklearn.cluster import KMeans  # Given data: Height and Weight  data = np.array([  [185, 72],  [170, 56],  [168, 60],  [179, 68],  [182, 72],  [188, 77],  [180, 71],  [180, 70]  ])  # Applying K-Means Clustering with K=2  kmeans = KMeans(n\_clusters=2, random\_state=42, n\_init=10)  kmeans.fit(data)  labels = kmeans.labels\_  centroids = kmeans.cluster\_centers\_  # Output the cluster labels  print("Cluster Labels:", labels)  # Plot the clusters  plt.figure(figsize=(8,6))  plt.scatter(data[:, 0], data[:, 1], c=labels, marker='o', label="Data Points")  plt.scatter(centroids[:, 0], centroids[:, 1], c='red', marker='X', s=200, label="Centroids")  plt.xlabel("Height")  plt.ylabel("Weight")  plt.title("K-Means Clustering (K=2)")  plt.legend()  plt.grid(True)  plt.show() |
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| Demo Code CSV File:  import numpy as np  import pandas as pd  import matplotlib.pyplot as plt  from sklearn.cluster import KMeans  # Load data from CSV file  data = pd.read\_csv("data.csv") # Ensure the CSV file has 'Height' and 'Weight' columns  # Extract relevant features  X = data[['Height', 'Weight']].values  # Applying K-Means Clustering with K=2  kmeans = KMeans(n\_clusters=2, random\_state=42, n\_init=10)  kmeans.fit(X)  labels = kmeans.labels\_  centroids = kmeans.cluster\_centers\_  # Output the cluster labels  print("Cluster Labels:", labels)  # Plot the clusters  plt.figure(figsize=(8,6))  plt.scatter(X[:, 0], X[:, 1], c=labels, marker='o', label="Data Points")  plt.scatter(centroids[:, 0], centroids[:, 1], c='red', marker='X', s=200, label="Centroids")  plt.xlabel("Height")  plt.ylabel("Weight")  plt.title("K-Means Clustering (K=2)")  plt.legend()  plt.grid(True)  plt.show() |
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