

Name :- Prashant Suresh Shirgave

Roll No:-03

Batch:T3

Class: TY(CSE-AIML)

Experiment No. 12

Title :- Implement K-Means clustering algorithm.

Aim:- Demonstrate K-Means clustering algorithm

Implementation:

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
from sklearn.datasets import make_blobs

# Generate sample data
X, y_true = make_blobs(n_samples=300, centers=3, cluster_std=0.60, random_state=0)

# Visualize the original dataset
plt.scatter(X[:, 0], X[:, 1], s=50)
plt.title("Original Dataset")
plt.xlabel("M1")
plt.ylabel("M2")
plt.show()

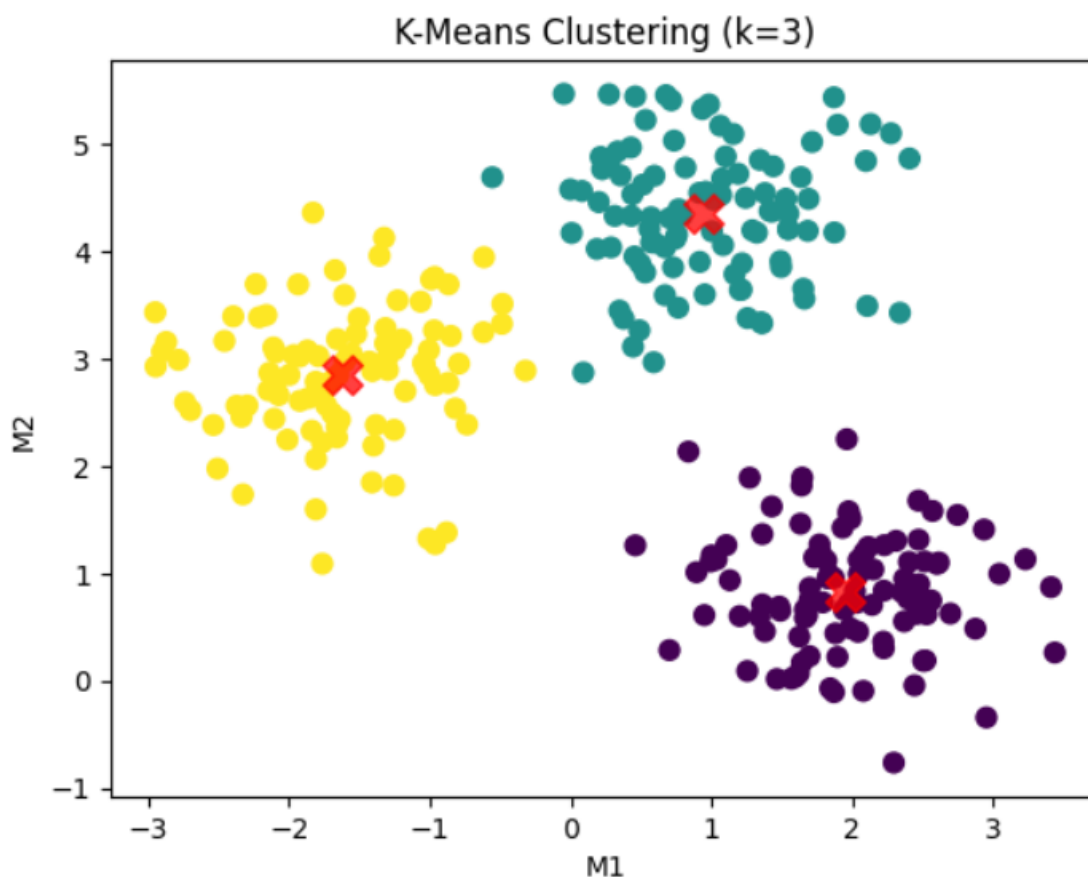
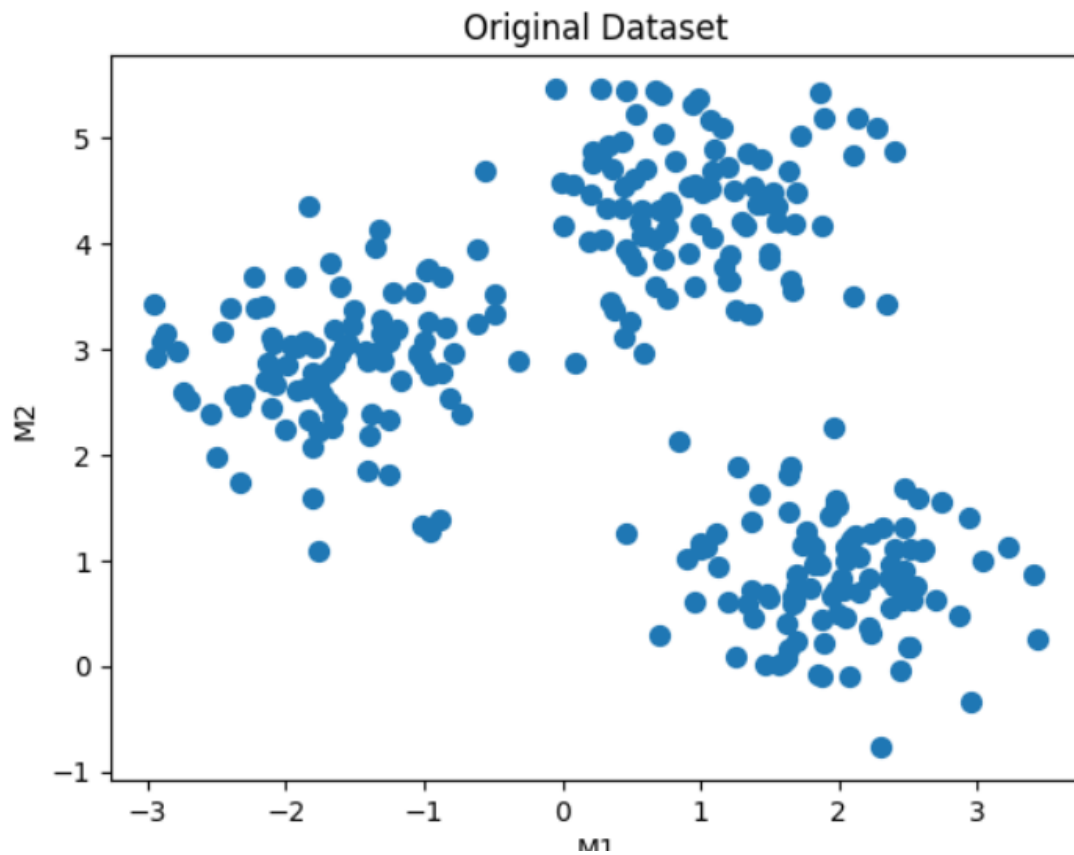
# Apply KMeans Clustering
k = 3 # Number of clusters
kmeans = KMeans(n_clusters=k)
kmeans.fit(X)

# Get predicted cluster labels
y_kmeans = kmeans.predict(X)

# Visualize the clustered data
plt.scatter(X[:, 0], X[:, 1], c=y_kmeans, s=50, cmap='viridis')

# Plot the centroids
centers = kmeans.cluster_centers_
plt.scatter(centers[:, 0], centers[:, 1], c='red', s=200, alpha=0.75, marker='X')
plt.title("K-Means Clustering (k=3)")
plt.xlabel("M1")
plt.ylabel("M2")
plt.show()
```

Output:



Conclusion: Students are able to implement K-Means clustering algorithm.