**EX.NO:10** **DATE:30/10/2024**

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## IMPLEMENTATION OF CLUSTERING TECHNIQUES K – MEANS

**AIM:**

To implement a K - Means clustering technique using python language.

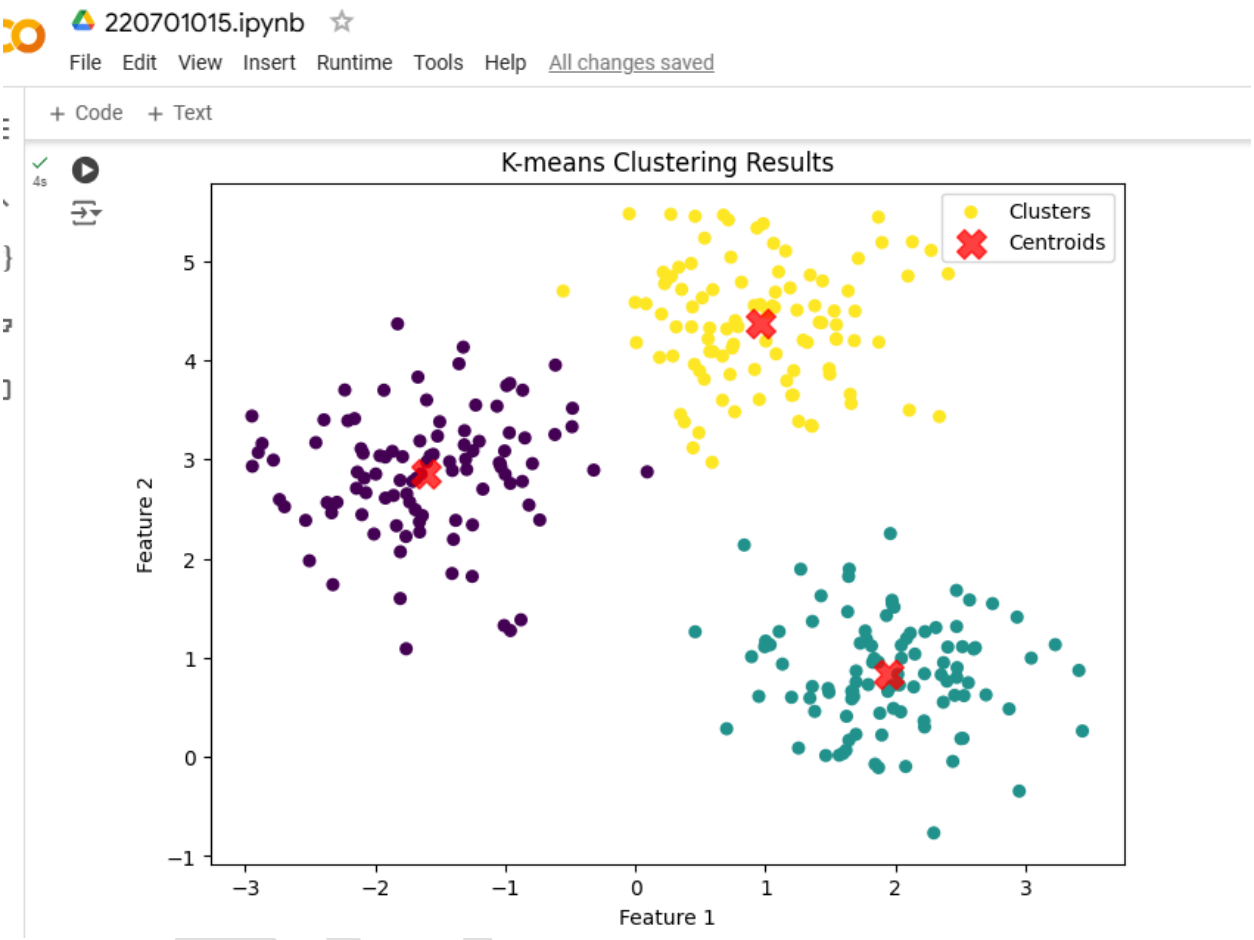
**EXPLANATION:**

- Import KMeans from sklearn.cluster
- Assign X and Y.
- Call the function KMeans().
- Perform scatter operation and display the output**.**

# CODE:

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

# Step 1: Import KMeans from sklearn.cluster (already done above)

# Step 2: Generate synthetic data and assign X and Y
# Creating a dataset with 3 clusters
X, y_true = make_blobs(n_samples=300, centers=3, cluster_std=0.60, random_state=0)

# Step 3: Call the function KMeans()
# Fit K-means with the chosen number of clusters (K=3)
K = 3
kmeans = KMeans(n_clusters=K, random_state=0)
y_kmeans = kmeans.fit_predict(X)

# Step 4: Perform scatter operation and display the output
plt.figure(figsize=(8, 6))
plt.scatter(X[:, 0], X[:, 1], c=y_kmeans, s=30, cmap='viridis', label='Clusters')
centers = kmeans.cluster_centers_
plt.scatter(centers[:, 0], centers[:, 1], c='red', s=200, alpha=0.75, marker='X', label='Centroids')
plt.title('K-means Clustering Results')
plt.xlabel('Feature 1')
plt.ylabel('Feature 2')
plt.legend()
plt.show()
```

**OUTPUT:**


220701015.ipynb
File Edit View Insert Runtime Tools Help All changes saved
+ Code + Text
K-means Clustering Results
Clusters
Centroids
Feature 1
Feature 2