# CSPC-54: INTRO TO AI AND ML

## LAB - 7: REPORT

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**AIM:**

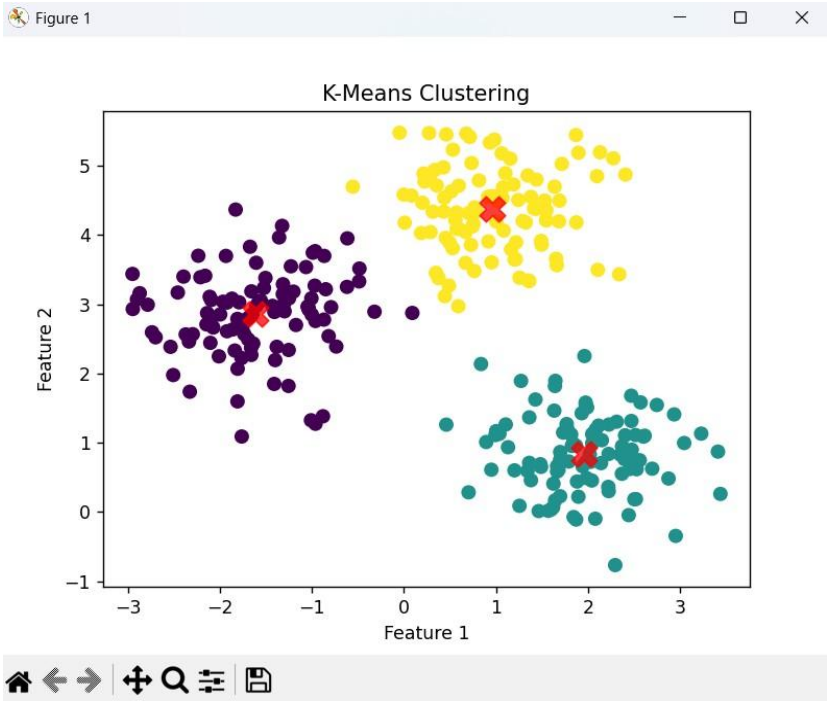
**ALGORITHM:**

## IMPLEMENTATION:

## K-MEANS CLUSTERING:

```
# Step 1: Import Libraries import
numpy as np import matplotlib.pyplot
as plt from sklearn.datasets import
make_blobs from sklearn.cluster import
KMeans

# Step 2: Create Sample Dataset
X, y = make_blobs(n_samples=300, centers=3, cluster_std=0.6,
random_state=0)
# Step 3: Apply K-Means kmeans = KMeans(n_clusters=3,
init='k-means++', random_state=0) y_kmeans =
kmeans.fit_predict(X)
# Step 4: Visualize the Clusters
plt.scatter(X[:, 0], X[:, 1], c=y_kmeans, s=50, cmap='viridis')
 centers =
kmeans.cluster_centers_
plt.scatter(centers[:, 0], centers[:, 1], c='red', s=200,
alpha=0.75, marker='X') plt.title("K-Means Clustering")
plt.xlabel("Feature 1") plt.ylabel("Feature 2") plt.show()
```



## SVM:

```
Time taken to build model: 0.03 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances         144               96      %
Incorrectly Classified Instances         6                4      %
Kappa statistic                          0.94
Mean absolute error                      0.2311
Root mean squared error                  0.288
Relative absolute error                 52      %
Root relative squared error             61.101   %
Total Number of Instances              150

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 1.000    0.000    1.000      1.000    1.000      1.000    1.000     1.000     Iris-setosa
                 0.980    0.050    0.907      0.980    0.942      0.913    0.965     0.896     Iris-versicolor
                 0.900    0.010    0.978      0.900    0.938      0.910    0.970     0.930     Iris-virginica
Weighted Avg.    0.960    0.020    0.962      0.960    0.960      0.941    0.978     0.942

=== Confusion Matrix ===

  a  b  c   <-- classified as
 50  0  0 |  a = Iris-setosa
  0 49  1 |  b = Iris-versicolor
  0  5 45 |  c = Iris-virginica
```