

Department of Computer Engineering
Academic Year 2023-2024, Sem-II

Report of Flip Classroom

Date- 11 /10 /2023

Topic: K-means and Hierarchical Clustering

Date & Time: 11/10 /2023 Time: 1:00 PM to 3:00 PM

No. of Participants:58/160

Mode of Conduction: Offline

Co-ordinator: Ms. M. S. Shelke / Ms. K. S. Ghuge

Topics given for study:

Unit No. 5, Topic : K-means and Hierarchical Clustering.

The students have been given study materials for self-study on the k-means and hierarchical clustering algorithms. Provide code examples and guides on how to implement these algorithms in programming languages such as Python. Their understanding of these topics was assessed through a practical demonstration using a real-world use case and problem solving. Following the session, there was an opportunity for participants to ask questions and clarify doubts.

Outcome of the session:

Participants are able to

1. Foster student motivation and accountability for their learning journey, promoting ownership.
2. Encourage self-directed learning with pre-class materials for a deeper understanding.
3. Develop communication and teamwork skills through group discussions.

Glimpses of the Session:

```
def k_means(data, k, max_iters=100):
    centroids = data[np.random.choice(len(data), k, replace=False)]

    for iteration in range(max_iters):
        labels = [calculate_closest_centroid(data_point, centroids) for data_p

        new_centroids = []
        for i in range(k):
            data_points = data[np.array(labels) == i]
            if len(data_points) > 0:
                new_centroids.append(data_points.mean(axis=0))

        if np.array_equal(new_centroids, centroids):
            break
        centroids = np.array(new_centroids)

    return centroids, labels

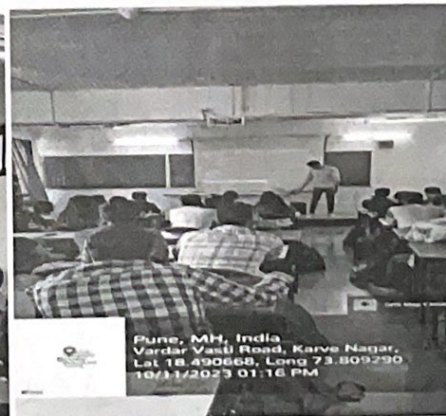
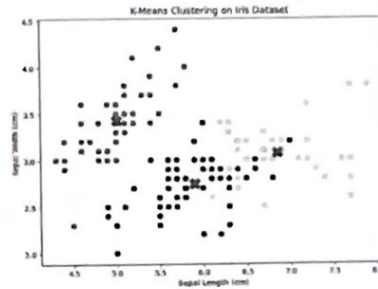
centroids, labels = k_means(data, k)

print(centroids)

[[58.45537333 29.49620493]
 [29.99521159 70.71389334]]
```

```
labels = kmeans.labels_
centroids = kmeans.cluster_centers_

in [ ]: plt.figure(figsize=(8, 6))
plt.scatter(X[:, 0], X[:, 1], c=labels, cmap='viridis', s=100)
plt.scatter(centroids[:, 0], centroids[:, 1], marker='x', c='red', s=100)
plt.title('K-Means Clustering on Iris Dataset')
plt.xlabel('Sepal Length (cm)')
plt.ylabel('Petal Length (cm)')
plt.show()
```



M.Shelke *K.S.Ghugre*
Ms.M.S.Shelke, Ms.K.S.Ghugre
Course Coordinator

Dr. K. S. Thakre
Dr. K. S. Thakre
HOD Computer Engg.