

## SESSION PLAN

### Session Name

Machine Learning: Clustering/ k-means

### Learning Outcomes

- Differentiate between supervised and unsupervised methods
- Know the different types of unsupervised methods
- Understand how K-means and hierarchical clustering works
- Solve unsupervised problems using clustering

### Prerequisites for the Student

- Machine Learning: Clustering/ k-means - Go through the concept and solve the tasks and assessments.

### Student Activities

- Ask learners what they have learned from the concept?
- Overview of Machine Learning: Clustering/ k-means
  - K-Means clustering
  - Hierarchical Clustering
- Blog on Clustering:  
<https://medium.com/data-science-group-iitr/clustering-described-63e62833099e>
- Hierarchical clustering intuition:<https://www.youtube.com/watch?v=0jPGHniVVNc>
- Assume, you want to cluster 7 observations into 3 clusters using K-Means clustering algorithm. After first iteration clusters, C1, C2, C3 has the following observations:
  - C1: {(3,3), (5,5), (7,7)}
  - C2: {(0,6), (6,0)}
  - C3: {(6,6), (10,10)}What will be the cluster centroids if you want to proceed for the second iteration?
- Practice problem on Machine Learning: Clustering/ k-means
  - Refer the GitHub repo for problems
- Quiz on Machine Learning: Clustering/ k-means.
- Code Along
- Questions and Discussion on doubts - AMA

### Next Session

- Concept - Challenges in Machine Learning
- Key topics to be highlighted - highlight where they would need to spend more time and importance w.r.t Data Science.
  - Different error metrics
  - Dealing with Imbalanced data
  - Dealing with small datasets
  - Values of K in K-Fold Validation
  - Optimal classifier choice