Department of Artificial Intelligence & Machine Learning Academic Year 2023-2024

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Batch: A1

Experiment No. 7

Aim: Image Segmentation

Objective: Develop a program to Segment Image using K Means Algorithm

Theory:

Image segmentation is the task of partitioning an image into multiple segments. In semantic segmentation, all pixels that are part of the same object type get assigned to the same segment.

Image segmentation is the process of partitioning a digital image into multiple distinct regions containing each pixel (sets of pixels, also known as superpixels) with similar attributes.

The goal of Image segmentation is to change the representation of an image into something that is more meaningful and easier to analyze.

Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. More precisely, Image Segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics.

K Means is a clustering algorithm. Clustering algorithms are unsupervised algorithms which means that there is no labelled data available. It is used to identify different classes or clusters in the given data based on how similar the data is. Data points in the same group are more similar to other data points in that same group than those in other groups.

- 1. Choose the number of clusters you want to find which is k.
- 2. Randomly assign the data points to any of the k clusters.
- 3. Then calculate the centre of the clusters.
- 4. Calculate the distance of the data points from the centres of each of the clusters.
- 5. Depending on the distance of each data point from the cluster, reassign the data points to the nearest clusters.
- 6. Again calculate the new cluster centre.
- 7. Repeat steps 4,5 and 6 till data points don't change the clusters, or till we reach the assigned number of iterations.

Observations



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(Autonomous College Affiliated to the University of Mumbai)



Department of Artificial Intelligence & Machine Learning Academic Year 2023-2024

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	R-means algorithm
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	Observation: K-mans is a clustering algorithm unsupervised meaning
	that there is no labeled data available.
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