

K-Means Clustering on CIFAR-10 Images

Dataset:

We will use the CIFAR-10 dataset.

Dataset links:

Official website: <https://www.cs.toronto.edu/~kriz/cifar.html>

TensorFlow loader: <https://www.tensorflow.org/datasets/catalog/cifar10>

Tasks

1: Load & Explore the Dataset

Load CIFAR-10, display sample images, report image shape, and number of images per class.

2: Preprocessing

Normalize pixel values and flatten images into vectors.

3: Apply K-Means

Run K-Means with $k=10$ and report inertia.

4: Visualize Centroids

Reshape centroids into images and visualize them.

5: Analysis

Discuss limitations of K-Means on CIFAR-10.