Part 1: K-mean clustering

1.Download any “*.jpeg” image to your local. Open and display it. Convert the image in to numpy array, so that i can be used in further processing.
[Hint: Use PIL module from python]

2. Find out the dimensions of the image and convert it in to a two-dimensional array.

3.Use kmeans clustering with k set to 3 and cluster the image.
[Hint: Refer to k-means module of scikit learn]

4. Predict the cluster label of every pixel in the image and plot it back as an image.

5. Find out the three dominant color in the image.
[Hint: The cluster centers should correspond to three dominant colors]

Part 2: Agglomerative Clustering

1.Load the file “zoo.data” and look at the info and first five rows. The first column denotes the animal name and the last one specifies a high-level class for the corresponding animal.

2. Find out the unique number of high level class.

3. Use the 16-intermediate feature and perform an agglomerative clustering.
[Hint: Refer to the agglomerative clustering module in scikit learn and set the number of clusters appropriately]

4. Compute the mean squared error by comparing the actual class and predicted high level class.

Project: Automotive Domain

Challenge/requirement

Lithionpower is the largest provider of electric vehicle(e-vehicle) batteries. It provides battery on a rental model to e-vehicle drivers. Drivers rent battery typically for a day and then replace it with a charged battery from the company. Lithionpower has a variable pricing model based on driver's driving history. As the life of a battery depends on factors such as overspeeding, distance driven per day etc.

You as a ML expert have to create a cluster model where drivers can be grouped together based on the driving data.

Key issues
Drivers will be incentivized based on the cluster, so grouping has to be accurate

Fields in Data
• id: Unique Id of the driver
• mean_dist_day: Mean distance driven by driver per day
• mean_over_speed_perc: Mean percentage of time a driver was > 5 mph over the speed limit

Business benefits
Increase in profits, up to 15-20% as drivers with poor history will be charged m