Assumption/Constraint:

A) I have kept the max no. of iteration as 100 for different value of K
B) I have used skimage library to pixel array conversion and vice versa.

Experiment Observations:

1. K-means algorithm is an optimization problem of finding the clusters in the given data-set. Execution time increases as the image dimensions increases or 'K' increases.
2. There is a tradeoff between the execution time and the number of colors represented in reconstructed image. Higher 'k' will produce better quality of compressed image but will take longer to execute.
3. One can conclude that the compression applied here is done only by reducing the number of colors in the image which is also called as Color Quantization. I have not reduced either the size of image or the intensity ranges of pixels.
4. K=10 seems to be good for Penguin image and k = 5 seems to be good for Koala image

Output

K: - No. of cluster

I: - No of Iteration

Original Image

Size: -759.6 KB

Size: - 762.53 KB

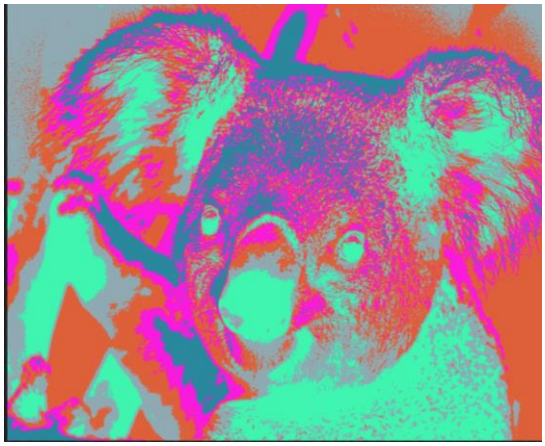
Assignment3 Machine Learning – ARC180006 (2. K-means clustering on images)

K=2, I= 100

Size: -176.91 KB

Size:167.37 KB

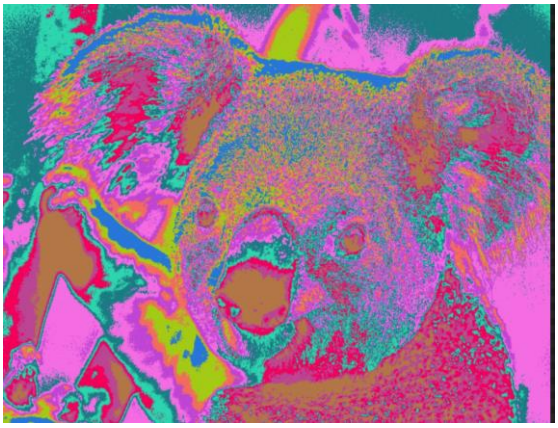
K=5, I=100



Size: -304.72 KB

Size: - 421.62

K=10, I = 100

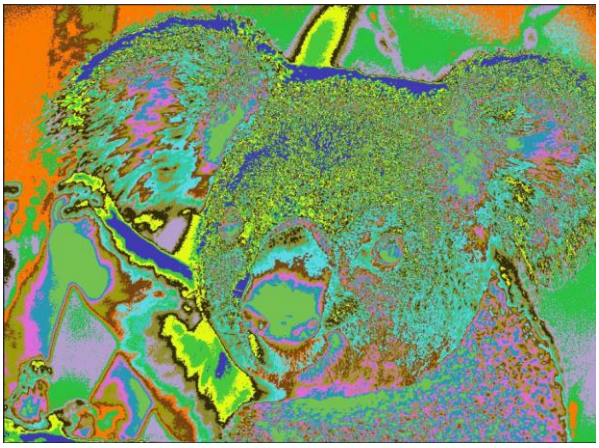


Size: -360.63 KB

Size:634.7

Assignment3 Machine Learning – ARC180006 (2. K-means clustering on images)

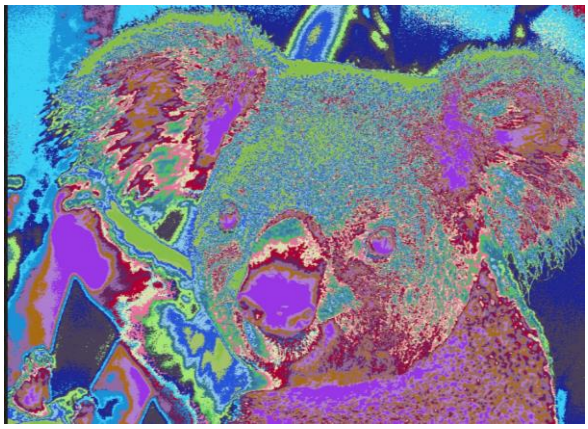
K=15, I = 100



Size: - 451.49 KB

Size: - 750.16

K=20, I 100



Size: -535.18 KB

Size:- 743.29