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CS6301.003
Assignment4

Program Report

In this assignment, we have done color quantization using k-means with k cluster values of 3, 5, 10, 20, 30 and PCA compression with pc principal components valued at 3, 260, 517, 774, 1031. Our chosen image had an original file size of 825.27 KB. Our first kmeans image with k = 3 has a file size of 294.68 KB. The image with k = 5 had a file size of 278.14. The image with k = 10 had a file size of 311.10 KB. The image with k = 20 has a file size of 314.02 KB. The image with k = 30 has a file size of 313.56 KB. We can notice that as the k value gets higher, the image size increases over time starting at 294.68 KB and ending at 313.56 KB. Also, as k increases, the quality of the images becomes closer and closer to the original.

Our first PCA image with pc = 3 had a file size of 118.21 KB. The image with pc = 260 has a file size of 357.68 KB. The image with pc = 517 has a file size of 355.76 KB. The image with pc = 774 has a file size of 340.13 KB. The image with pc = 1031 has a file size of 284.16 KB. We notice that when pc increases from 3 to 260, the file size increases drastically. Afterwards it slowly decreases again. In these images, the quality starts of poorer than in kmeans but with more color. The quality improves as pc increases. It looks smooth at pc = 1031.

We notice that the kmeans images have better shape and look cleaner, but lack the colors until k becomes higher. However, PCA images had good color, but lacked quality and smoothness until high levels of principal components.