

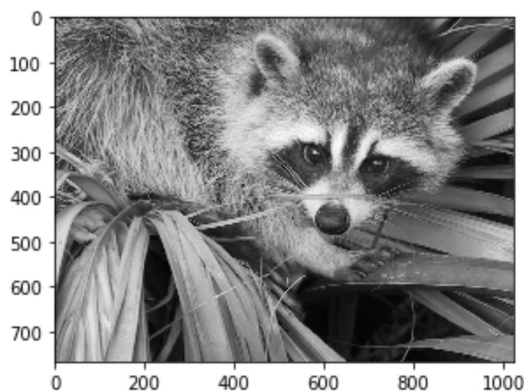
In this assignment students have to compress racoon grey scale image into 5 clusters. In the end, visualize both raw and compressed image and look for quality difference.

The raw image is available in scipy.misc package with the name face.

```
In [1]: import numpy as np
from sklearn.cluster import KMeans
import scipy.misc
import matplotlib.pyplot as plt
%matplotlib inline
```

Visualize the gray scale image

```
In [7]: face = scipy.misc.face(gray=True)
plt.figure(figsize=(10, 3.6))
plt.imshow(face, cmap=plt.cm.gray)
plt.show()
```



Compressing the gray scale image into 5 clusters

```
In [3]: rows = face.shape[0]
cols = face.shape[1]
image = face.reshape(rows*cols,1)
kmeans = KMeans(n_clusters = 5)
```

```
Out[3]: KMeans(algorithm='auto', copy_x=True, init='k-means++', max_iter=300,
n_clusters=5, n_init=10, n_jobs=1, precompute_distances='auto',
random_state=None, tol=0.0001, verbose=0)
```

```
In [4]: clusters = np.asarray(kmeans.cluster_centers_)
labels = np.asarray(kmeans.labels_)
labels = labels.reshape(rows,cols);
```

```
Out[4]: array([[2, 2, 0, ..., 2, 2, 0],
[1, 2, 2, ..., 2, 0, 0],
[1, 1, 2, ..., 2, 0, 0],
...,
[2, 2, 2, ..., 0, 0, 0],
[2, 2, 2, ..., 0, 0, 0],
[2, 2, 2, ..., 0, 0, 0]])
```

```
In [5]: plt.imsave('compressed_racoon.png', labels); #save compressed image
```

Visualize the compressed image

```
In [6]: image = plt.imread('compressed_raccoon.png')  
plt.figure(figsize=(10, 3.6))  
plt.imshow(image)
```

