SAMPLING & QUANTIZATION

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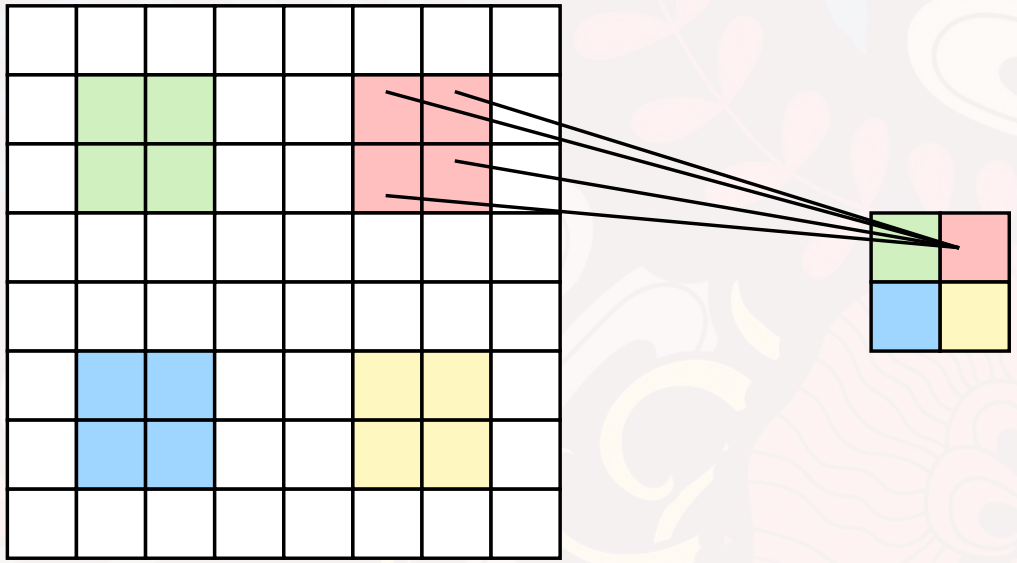
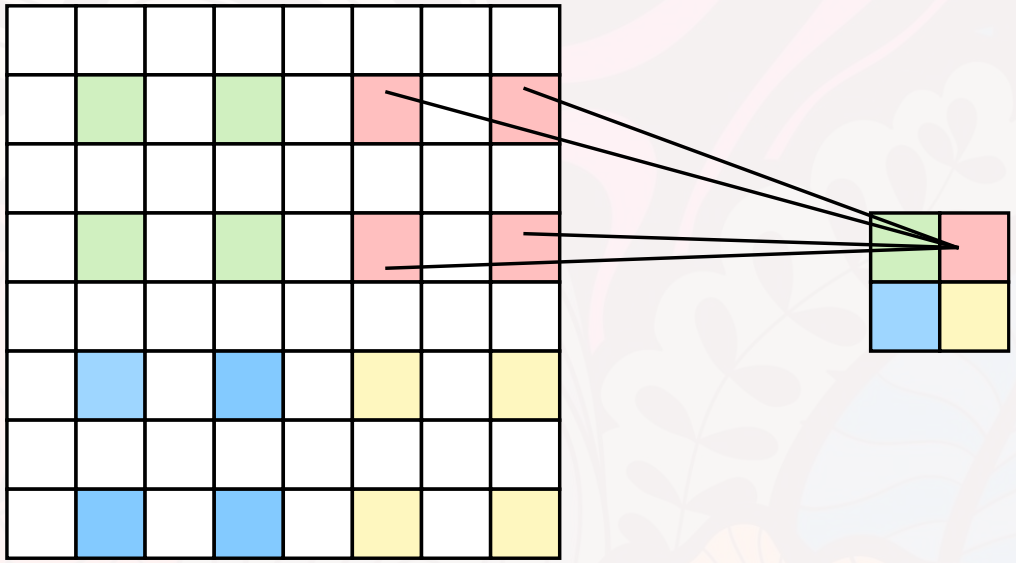
Language & Libraries

Sampling

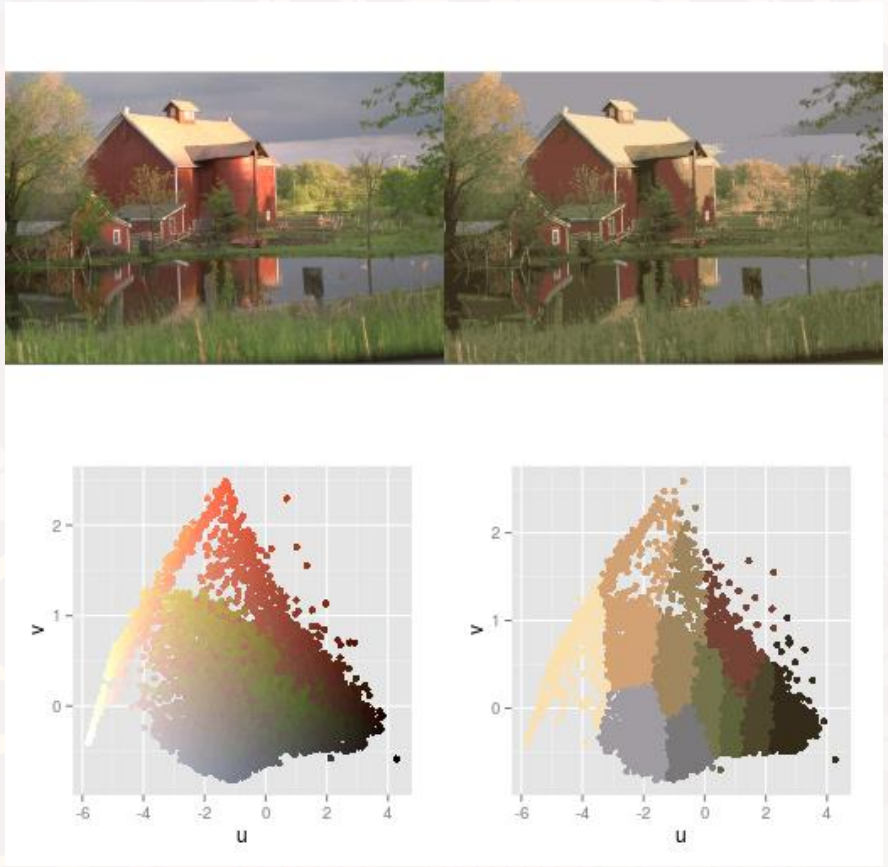
Variant A



Variant B



Quantization



Importing

```
import matplotlib.pyplot as plt
from skimage import io, color, util
from skimage.transform import rescale, resize, downscale_local_mean
from sklearn.cluster import KMeans
```

Sampling

```
def sampling():
    img = io.imread("MrGenie.JPG")
    fig, axes = plt.subplots(nrows=2, ncols=3)
    ax = axes.ravel()
    ax[0].imshow(img)
    ax[0].set_title("Original")

    for k in range(5, 0, -1):
        print(k)
        img_resized = resize(img, (img.shape[0] // 2**k, img.shape[1] // 2**k),
                             anti_aliasing=True)

        ax[k].imshow(img_resized)
        ax[k].set_title("x"+ str(2**k))

    plt.tight_layout()
    plt.show()
```

RESULT

Quantization

```
def quantization():
    original = io.imread("MrGenie.JPG")
    fig, axes = plt.subplots(nrows=2, ncols=3)
    ax = axes.ravel()
    ax[5].imshow(original)
    ax[5].set_title("original")

    for k in range(1, 6, 1):
        n_colors = 2**k
        arr = original.reshape((-1, 3))
        kmeans = KMeans(n_clusters=n_colors, random_state=42).fit(arr)
        labels = kmeans.labels_
        centers = kmeans.cluster_centers_
        less_colors = centers[labels].reshape(original.shape).astype('uint8')

        print(k-1)
        ax[k-1].imshow(less_colors)
        ax[k-1].set_title(str(n_colors) + " colors")

    plt.tight_layout()
    plt.show()
```

RESULT

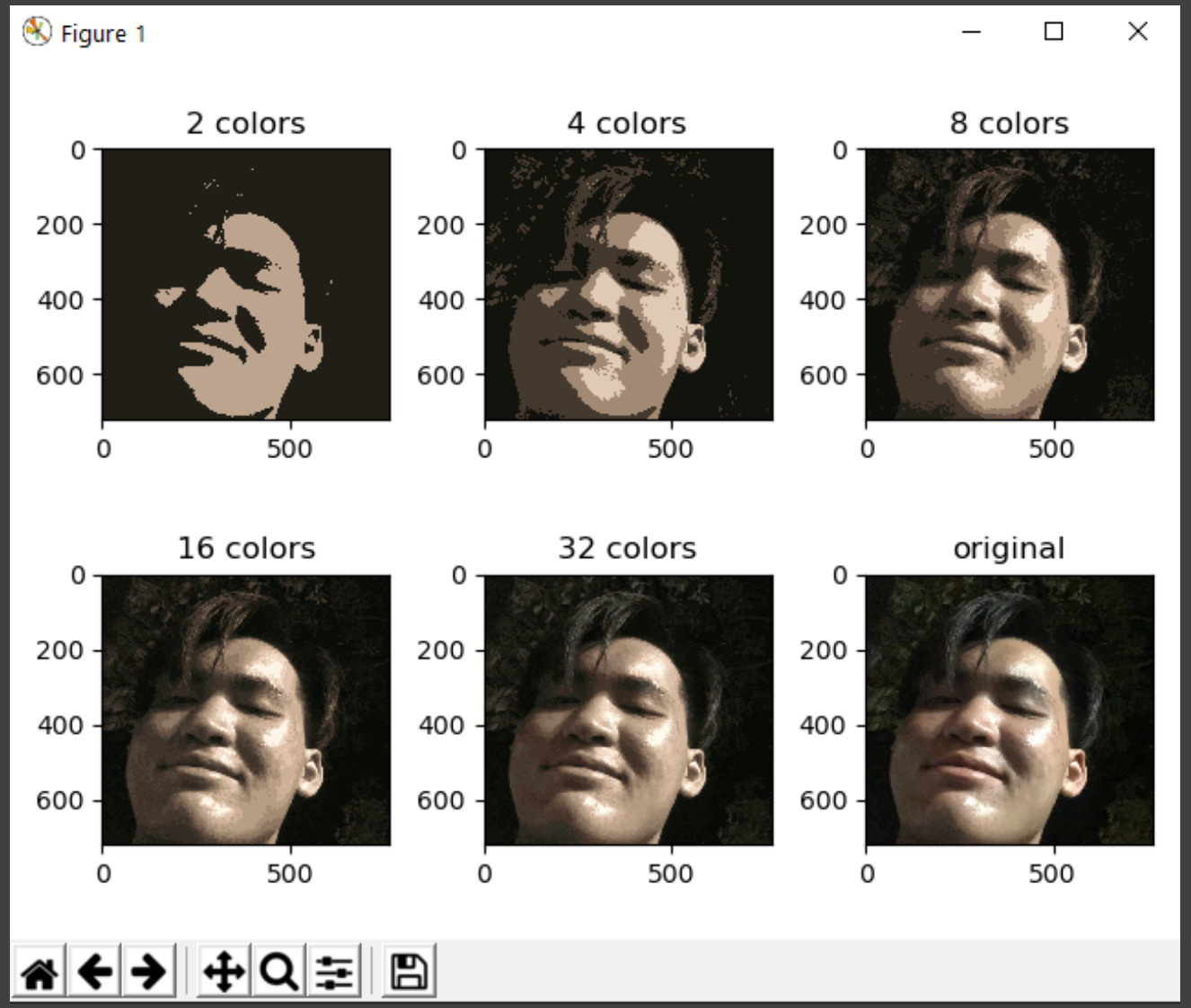


Figure 1
2 colors
4 colors
8 colors
16 colors
32 colors
original
0
200
400
600
0
500

Reference

Code:
https://scikit-image.org/docs/stable/auto_examples/transform/plot_rescale.html

from Tonechas
https://stackoverflow.com/questions/48222977/python-converting-an-image-to-use-less-colors

https://scikit-learn.org/stable/auto_examples/cluster/plot_color_quantization.html

logo:
python
https://cdn3.iconfinder.com/data/icons/logos-and-brands-adobe/512/267_Python-512.png

matplotlib
https://commons.wikimedia.org/wiki/File:Matplotlib_icon.svg
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pic
http://gudok.xyz/thumbnail/

https://laptrinhx.com/color-quantization-in-r-2674409921/#