Pattern Recognition – HW#1

About the Assignment

The main purpose of the homework is to obtain some basic information about the images.

Fig 1. Original Images

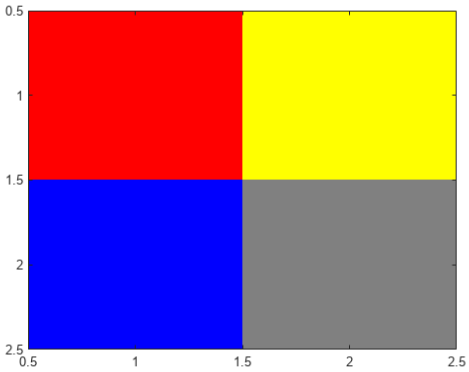

Fig 2. Color Template

Pre-Information

The originals of the pictures are in the homework file. Use the pictures given to you while doing your homework. First **read images** and then **plot** .

- First, start by reading the pictures. While reading, you must give the file path with the pictures in the code. The image size is 224x224x3.

  img1 = plt.imread('cat1.jpg')

- If you want to see the pictures on the screen, use the “plt.imshow(img1); plt.show()” function.

- These graphics should be drawn separately for each picture. You can use plot() function to draw graphs and show() functions to show them.
- The show() function in pyplot module of matplotlib library is used to plot something.

You can access a pixel values of a color image:

- Ex1.

  R,G,B = img[0,0,:]

Task1:

- Read the image given in Fig. 2.
- You are expected to apply the following color transformation to each pixel coordinate.

From RGB to YIQ

$$\begin{bmatrix} Y \\ I \\ Q \end{bmatrix} \approx \begin{bmatrix} 0.299 & 0.587 & 0.114 \\ 0.5959 & -0.2746 & -0.3213 \\ 0.2115 & -0.5227 & 0.3112 \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

From YIQ to RGB

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1 & 0.956 & 0.619 \\ 1 & -0.272 & -0.647 \\ 1 & -1.106 & 1.703 \end{bmatrix} \begin{bmatrix} Y \\ I \\ Q \end{bmatrix}$$

- You can use for loops.
- Firstly, convert image from RGB2YIQ with for loops.
- Secondly, convert image from YIQ2RGB with for loops.

Task1:

- You are expected to apply the following rotations to images.
- - flips cat and dog images vertically
- - flips cat and dog images horizontally
- - rotates cat and dog images to left by 90 degree

- - rotates cat and dog images to right by 90 degree
- - resizes cat and dog images to half by keeping aspect ratio
- - finally, displays input and output images

Things to Pay Attention

1. Kullandığınız platform ne olursa olsun ipynb dosyasını yükleyiniz.
2. Her bir soru parçacığı için farklı ipynb dosyası ve rapor hazırlanmamalı, tek bir python dosyası (ipynb) ve tek bir pdf raporu hazırlamanız gerekmektedir.
3. Python dosyası ve Raporların isimlendirmelerine dikkat edilmesi
4. Raporun formatına uygun olarak hazırlanması beklenilmekte ve rapora sadece resim koymayınız. Sadece resim gönderirseniz notunuz düşebilir. Raporda elde edilen sonuç veya resimlere yorum eklemeniz gerekmektedir.
5- Tek bir tane zip dosyası göndereceksiniz; içinde ipynb ve pdf dosyası olacak.

1. Regardless of the platform you use, download the ipynb file.
2. you should prepare a single python file (ipynb) and a single pdf report.
3. Pay attention to the naming of the Python file and Reports
4. It is expected that the report will be prepared in accordance with its format and do not include only pictures in the report. If you only post a picture, your grade may go down. You must add comments to the results or pictures obtained in the report.
5- You will send a single zip file; It will contain ipynb and pdf file.

Good Luck.