Topic: Color Detection

The tutorial is in Matlab and it contains one idea on detecting the color. This is not the best. You are free and most definitely encouraged to use your own ideas. Use 'help' at all times for the function reference.

1. **Image Acquisition** :

   Functions: imaqtool, imaqreset

```
vid = videoinput('winvideo', 1, 'YUY2_640x480'); %sample device format
im1=getsnapshot(vid);
imshow(im1);
vid.ReturnedColorSpace='RGB';
im2=getsnapshot(vid);
figure,imshow(im2);

% Figure is written to show the next image in a different figure.
% Try it without writing and see the difference
% See the difference between im1 and im2. They are in different color space.
% No need to go into details right now.
```

2. **Read and show image**:
   i. imread `I=imread('image.jpg');`
   ii. imshow `imshow(I);`
3. **Grayscale conversion and binarize:**

   Functions we used: rgb2gray, graythresh, im2bw, imsubtract, medfilt2

   Steps: i. Turn the rgb image to grayscale.

   ii. Extract 3 layers from the rgb image.

   iii. Subtract the grayscale image from each layer.

   iv. Use the median filter.(optional)

   v. Binarize each subtracted layer using its own threshold.

4. **Get the region of interest:**

   Functions we used: bwlabel, max, regionprops, cat, bwareaopen

   Steps: i. Label all the components in the 3 binarized layers.

   ii. If it is less than a certain value (you decide), that's the layer your region of interest falls in and that layer defines what color of the image is. (Voila!)

   iii. To get rid of the noises, keep only the maximum area of the image (The layer you got from step 2). And now this image will be the input for shape detection.