EE152 Lab 1

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Contents

Reset the Program

```
clear all;
close all;
```

Load the image

Here I am going to read in the image and store it in a variable *img*

```
img = imread('gogol.jpg');
```

Display the image

Show the image with `imshow()`

```
imshow(img)
```

Now I am going to use `image()`

```
image(img)
```

Finally I am going to use `imagesc()`

```
imagesc(img)
```

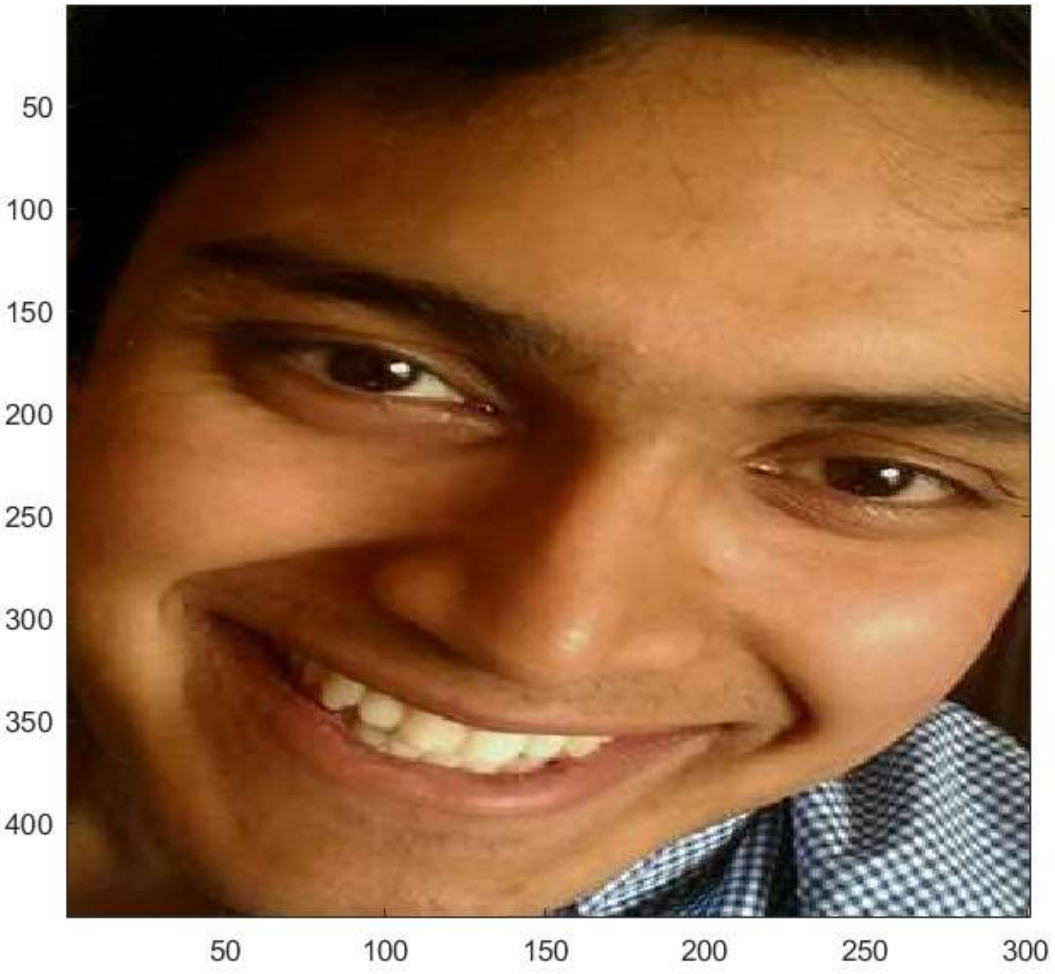
Resizing the Image

```
resized_img = imresize(img, [256 256]);
image(resized_img);
```

Cropping face image

Here I am extracting the face from the full image.

```
face_img = img(75:520,100:400,:);
image(face_img)
```



Replacing Face Region with colored boxes

Create a copy of the image.

```
boxed_face_img = img(:,:,:);
```

Add in the white stripe first

```
boxed_face_img(75:520,100:159,1:3) = 255;
```

Add in the black stripe next

```
boxed_face_img(75:520,160:219,1:3) = 0;
```

Add in the Red stripe next

```
boxed_face_img(75:520,220:279,1) = 255;
```

```
boxed_face_img(75:520,220:279,2:3) = 0;
```

Add in the Blue stripe next

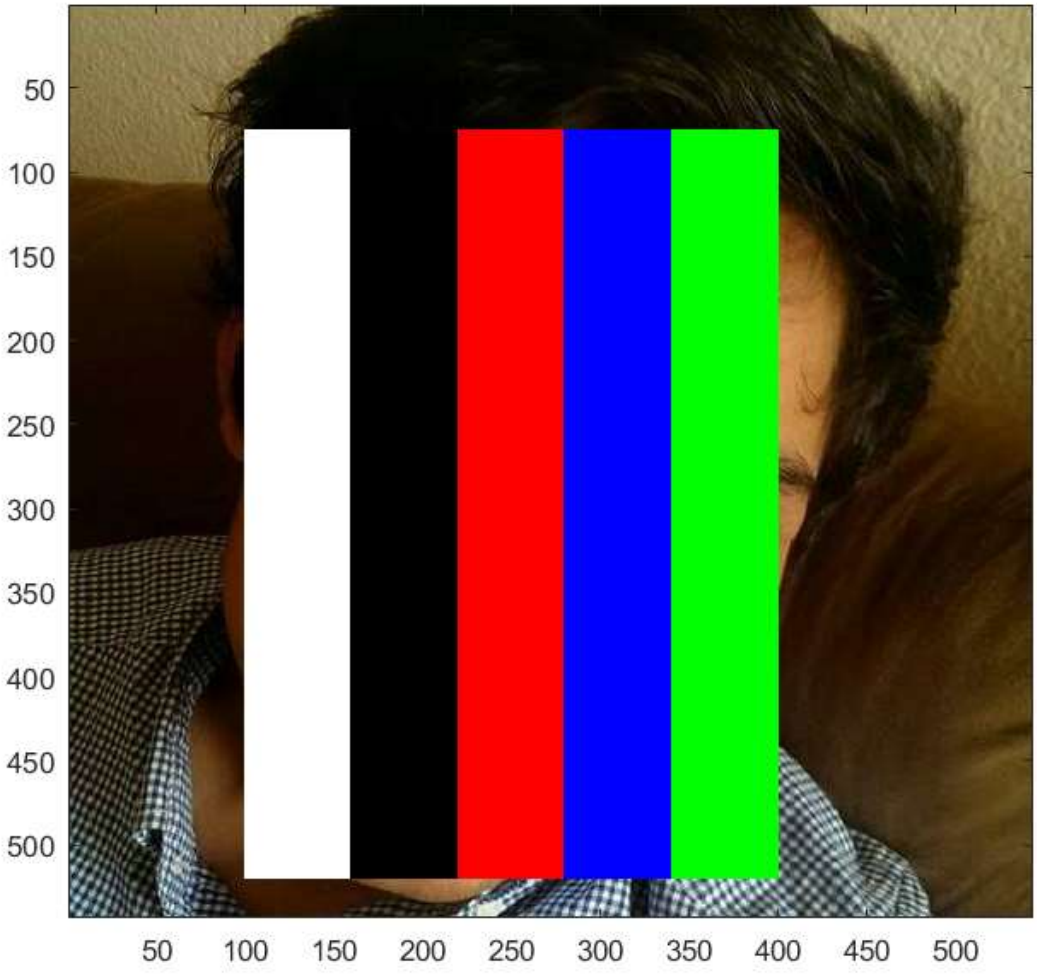
```
boxed_face_img(75:520,280:339,1) = 0;
boxed_face_img(75:520,280:339,2) = 0;
boxed_face_img(75:520,280:339,3) = 255;
```

Add in the Green stripe next

```
boxed_face_img(75:520,340:400,1) = 0;
boxed_face_img(75:520,340:400,2) = 255;
boxed_face_img(75:520,340:400,3) = 0;
```

Finally show the iamge

```
image(boxed_face_img);
```



Resize face image

```
face_img_resized = imresize(face_img, [64 64]);
image(face_img_resized);
```

Save Images

Save the resized full image

```
imwrite(resized_img, 'gogol_256.jpg');
```

Save the resized face image

```
imwrite(face_img_resized, 'gogol_face_64.jpg');
```

Histograms of full image

Extract each of the color channels. The channels need to be convered to doubles in order for `hist` to work.

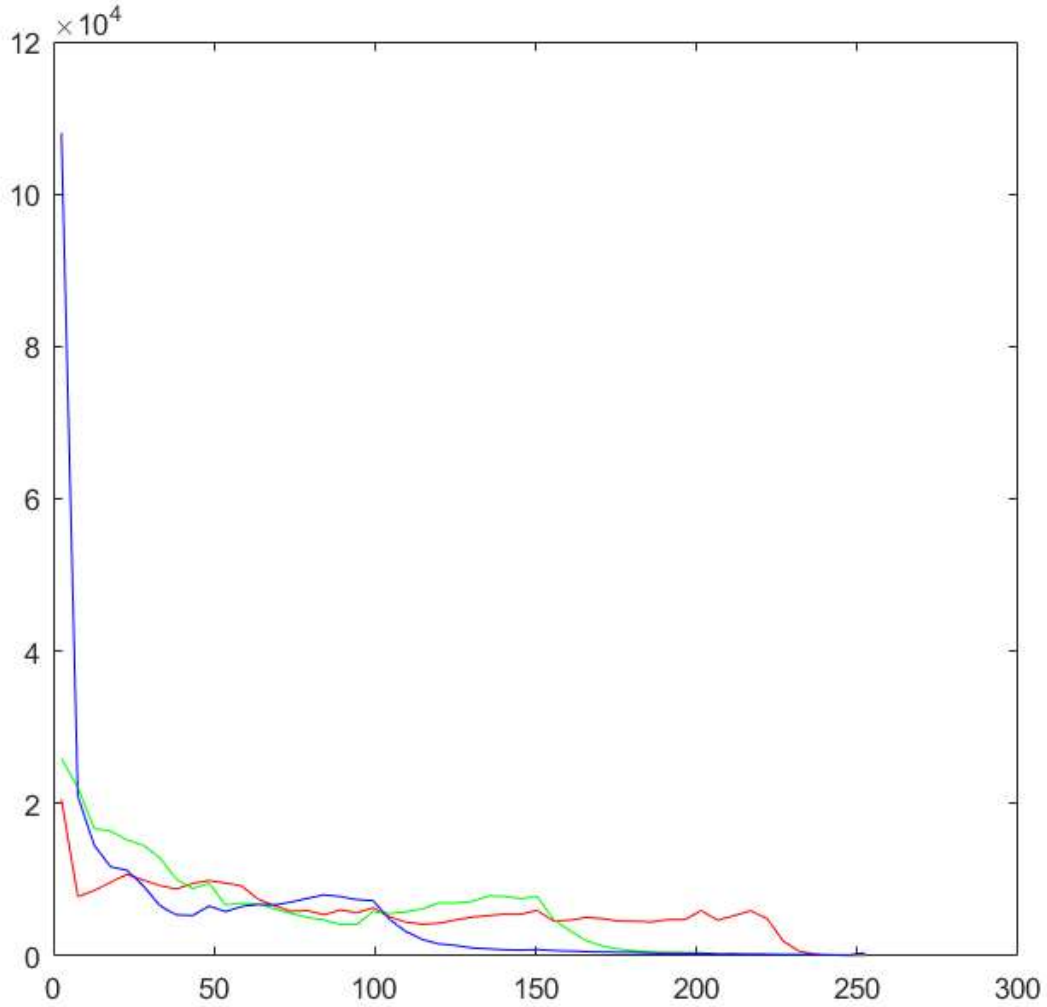
```
full_red = double(img(:,:,1));
full_green = double(img(:,:,2));
full_blue = double(img(:,:,3));
```

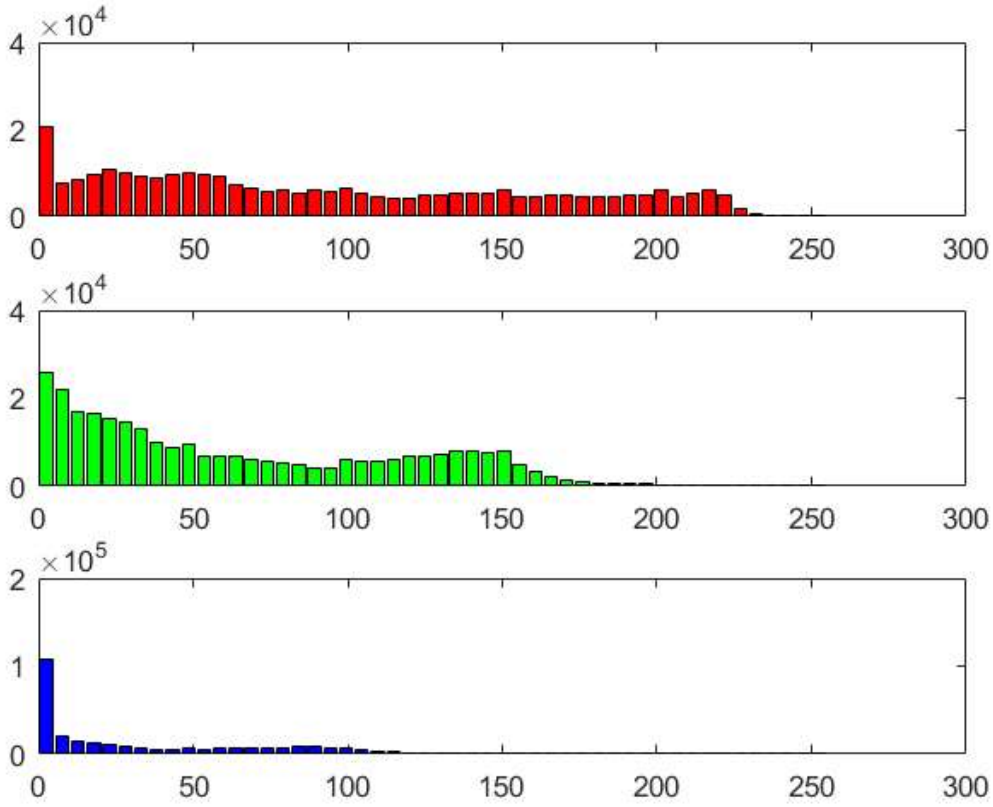
Get the histograms for each. Remebering to convert each matrix to an array

```
nBins = 50;
[count_red, centers_red] = hist(full_red(:), nBins);
[count_green, centers_green] = hist(full_green(:), nBins);
[count_blue, centers_blue] = hist(full_blue(:), nBins);
```

Plot it

```
plot(centers_red, count_red, 'Red', centers_green, count_green, 'Green', centers_blue, count_
blue, 'Blue');
figure;
subplot(3,1,1), bar(centers_red,count_red,'r');
subplot(3,1,2), bar(centers_green,count_green,'g');
subplot(3,1,3), bar(centers_blue,count_blue,'b');
```





Histograms of face image

Extract each of the color channels again converting it to doubles.

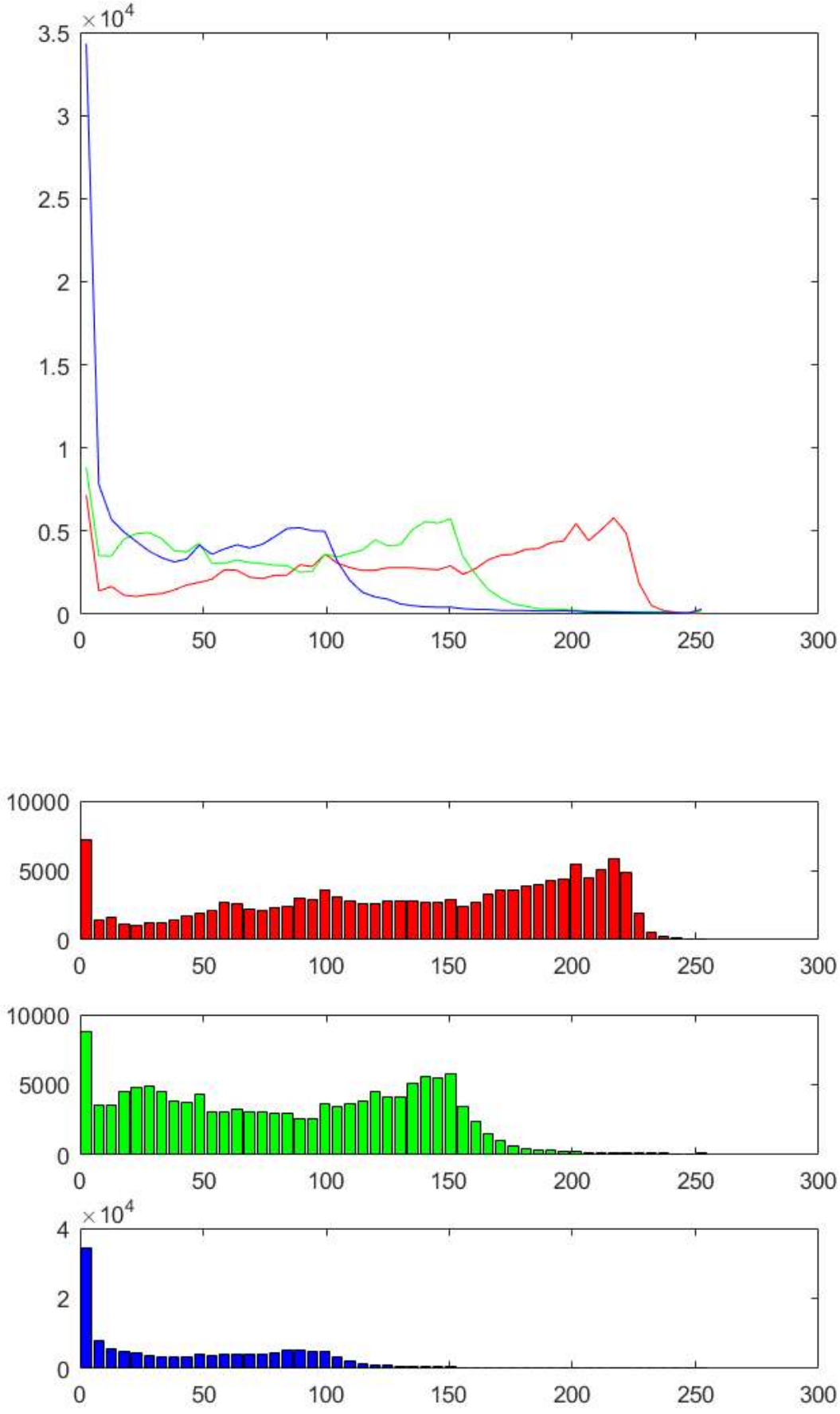
```
face_red = double(face_img(:,:,1));
face_green = double(face_img(:,:,2));
face_blue = double(face_img(:,:,3));
```

Get the histograms for each.

```
[count_red_face, centers_red_face] = hist(face_red(:), nBins);
[count_green_face, centers_green_face] = hist(face_green(:), nBins);
[count_blue_face, centers_blue_face] = hist(face_blue(:), nBins);
```

Plot it

```
figure;
plot(centers_red_face, count_red_face, 'Red', centers_green_face, count_green_face, 'Green',
centers_blue_face, count_blue_face, 'Blue');
figure;
subplot(3,1,1), bar(centers_red_face,count_red_face,'r');
subplot(3,1,2), bar(centers_green_face,count_green_face,'g');
subplot(3,1,3), bar(centers_blue_face,count_blue_face,'b');
```


×10^4
3.5
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250
300
10000
5000
0
0
50
100
150
200
250
300
10000
5000
0
0
50
100
150
200
250
300
×10^4
4
2
0
0
50
100
150
200
250
300

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