Demo Session for Lecture Notes-01 (Introduction to CV)

Install the `opencv-python` image utility for image related API. You can use the following two statements in your codalab notebook or jupyter notebook.

```
!pip install imutils
!pip install opencv-python
```

You can use your own gallery pictures to do the exercise or else use some pictures which are provided in the attached folder.

1. Load an image using `cv2.imread` and visualize it using `plt.imshow`. Print the height and width of the image loaded. What is the datatype in which the image is loaded?. (Use `cv2.cvtColor(image, cv2.COLOR_BGR2RGB)` to change color from loaded BGR format to RGB format.)

   Sample Output of given `Sun_Flower.jpg` file

   

2. Visualize your image in grey scale and plot the intensity values histogram of the same. Now quantize your grey-scale image to 4 colors and visualize it along with its corresponding histogram.
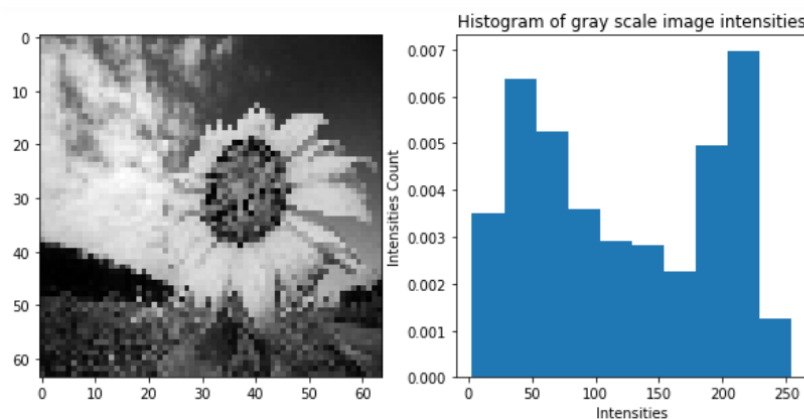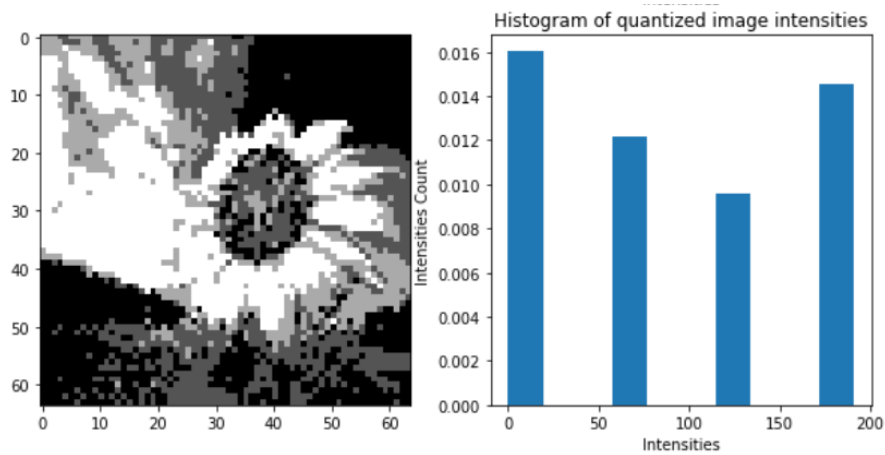
   

3.  Increase or decrease your brightness of the image by scaling($\alpha$) or shifting($\beta$) your Intensity values (Refer link to how to scale). Plot the original intensity values on x-axis and scaled intensity values on y-axis to understand the shifting of colors in your original and scaled images.
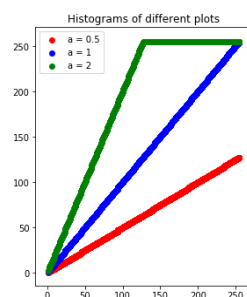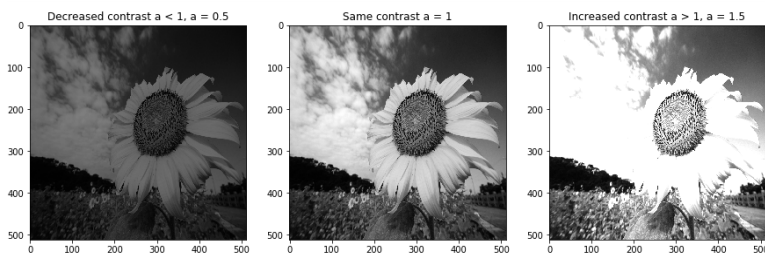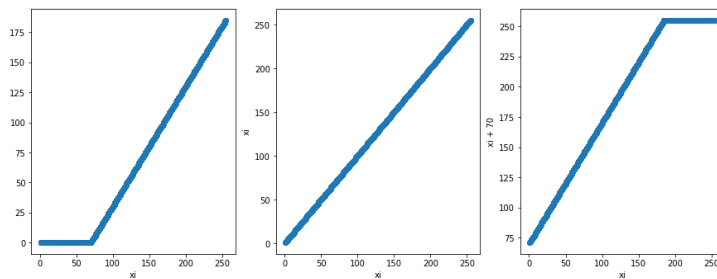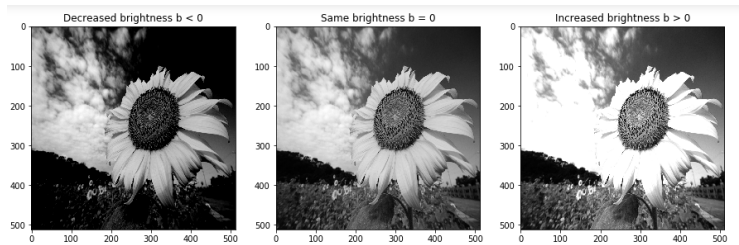
4. Write `hist_stretch` function which takes an image and returns the stretched histogram image. Apply the function to `Capture.jpg`. Plot the original image histogram and modified image histogram.



Original image

Histogram stretched image
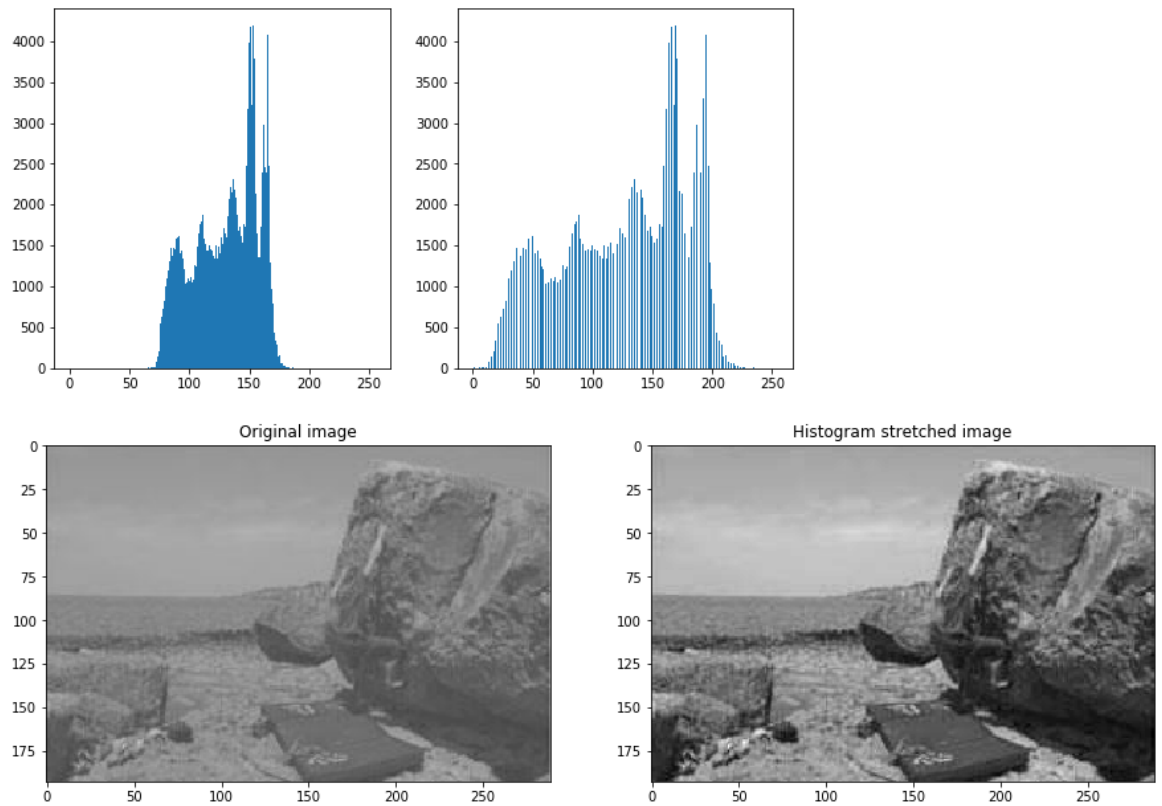
5. Write `hist_equalize` function which takes an image and returns histogram equalized image. Apply the function to `equalize.jpg`.



Original image

Histogram stretched image
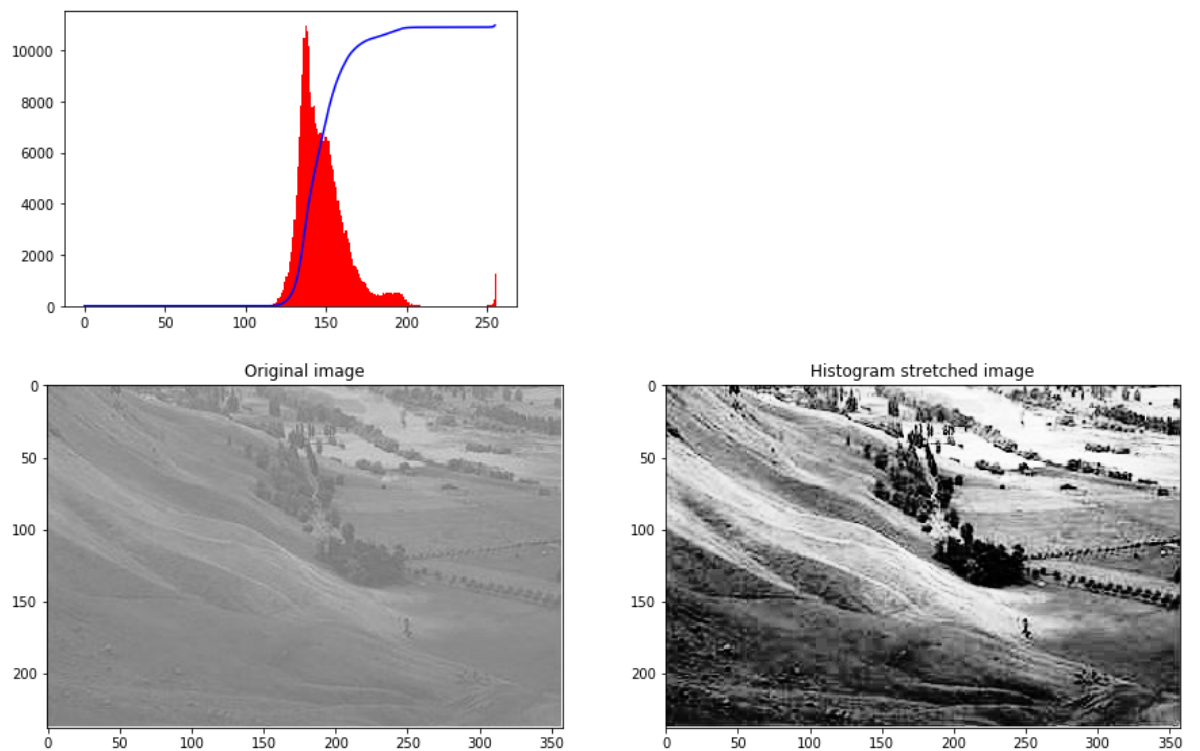
6. Write a function to find log mapping of an `car_log.jpg` image and a function to find exponential mapping of `game_exp.jpg` image.