Report of MP3

1. Histogram Equalization

In the 0 -255 of an 8- bit image, to improve the image contrast, by redistributing the pixel intensity.

2. Light Correction

To make the objects in image more distinguishable, make it more clear. Including liner lighting and quadratic lighting.

3. Algorithm Implementation

Histogram Equalization:

1. Initialize image in grayscale.
2. Create the histogram chart with 256 bins, and set to zero.
3. Incrementing the bin based on pixel's intensity of image, by iterating each pixel

Transformation function (CDF calculation):

1. Function "T" uses 256 values set to zero.
2. The first "T" remains the same as the first value of "H".
3. The cumulative value of the remaining bins is calculated by accumulating the "H".
4. Then normalize "T" by dividing each value by the last value in "T".

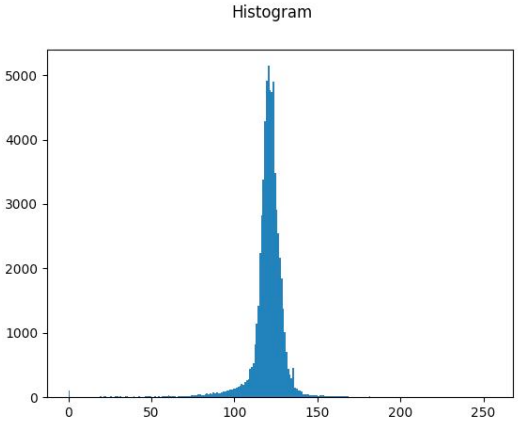
Linear Lighting:

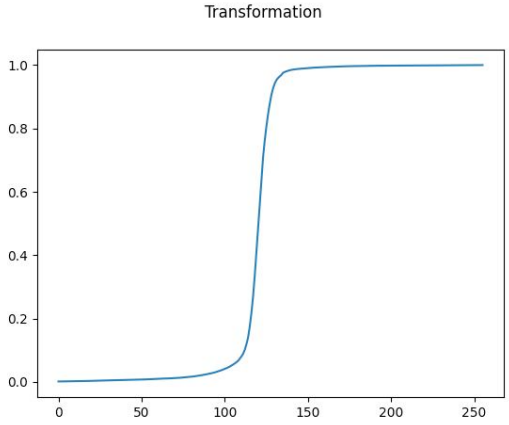
1. Create plane: a copy of original image
2. Linear regression
3. Plane fitting
4. Correction: The lighting-corrected image is obtained by adjusting each pixel's intensity based on the difference from the plane and the average value

Quadratic Lighting:

1. Create plane: a copy of original image
2. quadratic regression
3. quadratic surface fitting
4. Correction

4. Result analysis





From the result we can see most color distruction in 80 – 150. Then focus on this range, we can make CDF transformation. After that, we can get our recolored moon.bmp.

Linear lighting:

Quadratic lighting:

After we fitting a plane and get two lightered images, we can see, these two images are more detailed and quadratic lighting are lighter than linear lighting.