Homework 1 Color Computing

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1 Question 1

1.1 Original Image in RGB

1.2 Transformed Image in CIE-XYZ

1.3 Working of cvtColor Function of CV2 library

To convert RGB pixel to XYZ. we multiple it with a constant matrix.

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} \leftarrow \begin{bmatrix} 0.412453 & 0.357580 & 0.180423 \\ 0.212671 & 0.715160 & 0.072169 \\ 0.019334 & 0.119193 & 0.950227 \end{bmatrix} \cdot \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

2 Question 2

Compute the color histogram of this given image using Matlab/Python, and plot your result.

2.1 Approach

Used the CV2 library to read the image into a numpy 2d array. After loading the image checked the shape of the image which was 512, 512, 3. Then with a simple loop iterated over the 2d array to calculate the frequency of the every value using three different arrays of size of 256 each for RGB color. Saved the generated graph in **RGB_Histogram.png** file.

2.2 Result