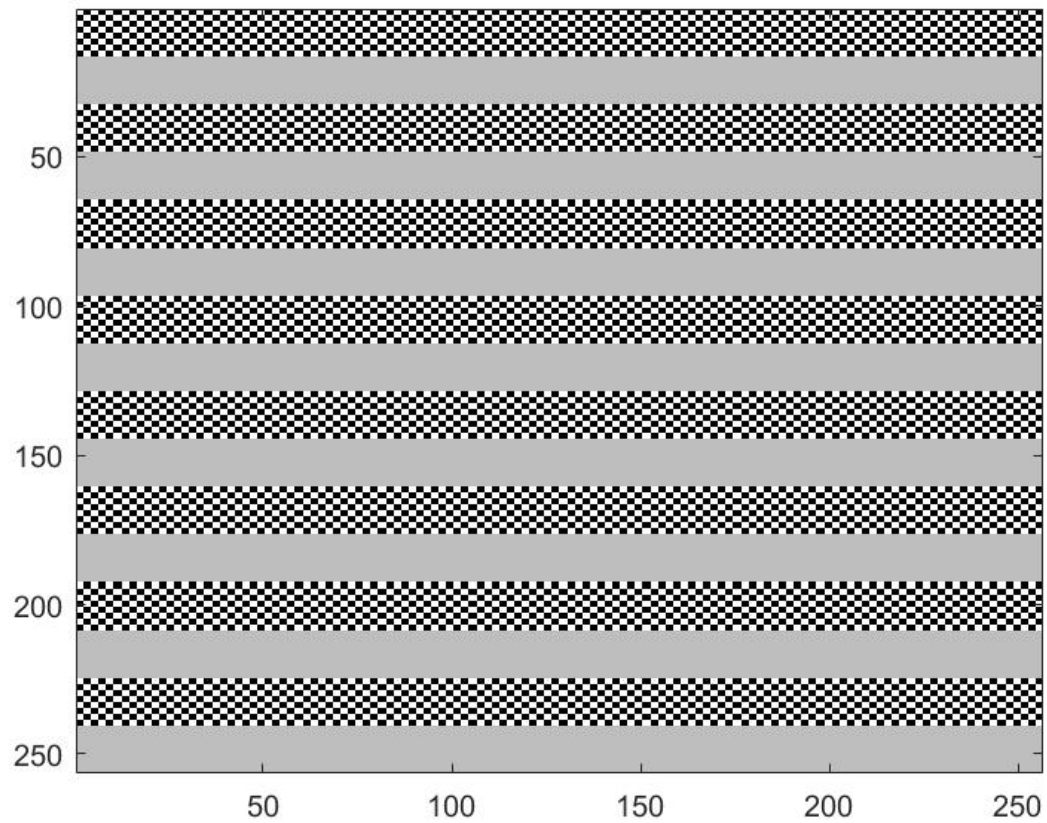


Name: Muhammad Yasir Abbas

Roll No: L16-4154

Q#1:

The image of matching gray level is formed by concatenating the checkerboard pattern with a gray level.



Q#2:

expression relating the matching gray level to the gamma of monitor is as follows:

we know that

$$I_g = I_{255} \left(\frac{g}{255} \right)^\gamma$$

$$I_g = I_c \quad (\text{Perceived Intensity})$$

$$\cancel{I_{255}} \left(\frac{g}{255} \right)^\gamma = \cancel{I_{255}} \frac{1}{2}$$

$$\left(\frac{g}{255} \right)^\gamma = \frac{1}{2}$$

From our checkboard experiment

we found $g = 191$

$$\left(\frac{191}{255} \right)^\gamma = \frac{1}{2}$$

Taking log on both sides

$$\ln \left(\frac{191}{255} \right)^\gamma = \ln \left(\frac{1}{2} \right)$$

$$\gamma \ln \left(\frac{191}{255} \right) = \ln \left(\frac{1}{2} \right)$$

$$\gamma = \ln \left(\frac{1}{2} \right) \div \ln \left(\frac{191}{255} \right)$$

$$\boxed{\gamma = 2.39}$$

Q#3:

When gamma is calculated it comes out to be 2.39 which is approximately equal to 2.4. Gamma is corrected using equation

$$\text{Corrected} = 255 * (\text{Image}/255) ^ {1/2.4}.$$

