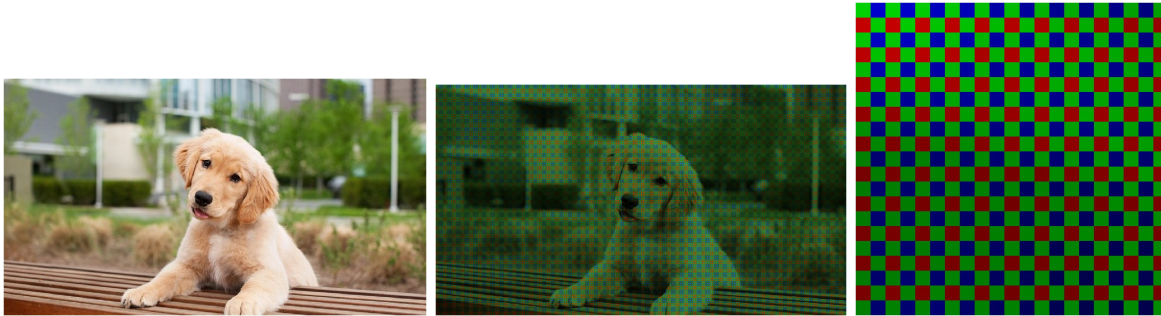
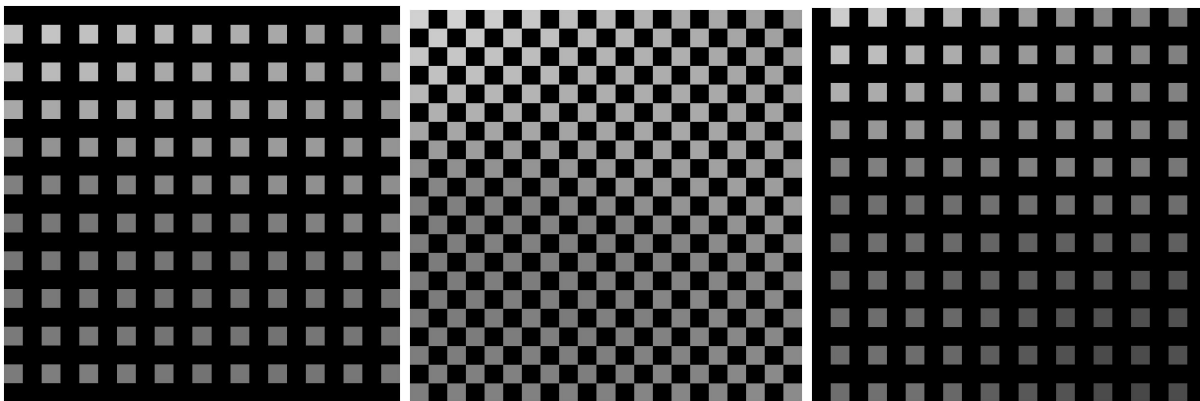


Question 1:

- a) Started off with an image of a puppy, and zeroed out the RGB of the correct channels at the correct pixel locations.



Then separated out the three channels into intensity images.



- b) Next use convolution to do a linear “average” over the RGB channels (creating three intensity images for each channel:

i) Green Filter = $\begin{bmatrix} 0 & 0.25 & 0 \\ 0.25 & 1 & 0.25 \\ 0 & 0.25 & 0 \end{bmatrix};$

ii) RB Filter = $\begin{bmatrix} 0.25 & 0.5 & 0.25 \\ 0.5 & 1 & 0.5 \\ 0.25 & 0.5 & 0.25 \end{bmatrix};$

Red



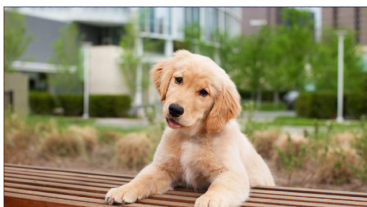
Green



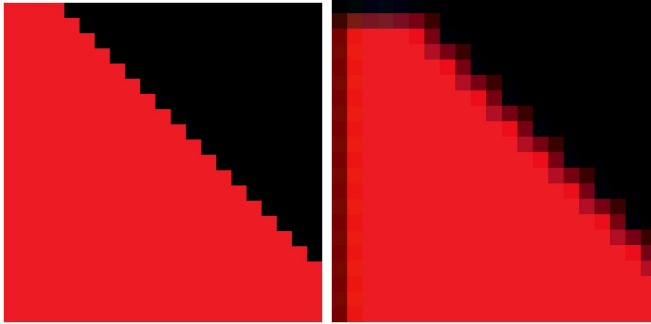
Blue



Which is finally concatenated back together to form an image in the likeness of the original.



- c) This approach produces a few artifacts, but most noticeably is the “blurring” effect on high intensity edges. Because the reconstruction process takes a linear average over the bayer-masked grid space, you aren’t guaranteed that every part of the edge falls under the correct part of the mask to accurately reconstruct the full intensity shift, and you end up with a gradient pattern along the high intensity edge instead of a sharp edge.



Question 2:

I apologize but I have run out of time to finish this assignment. I have completed a) b) and c) for Question 2. I will leave the plots to be viewed when running the code as they are randomly generated.