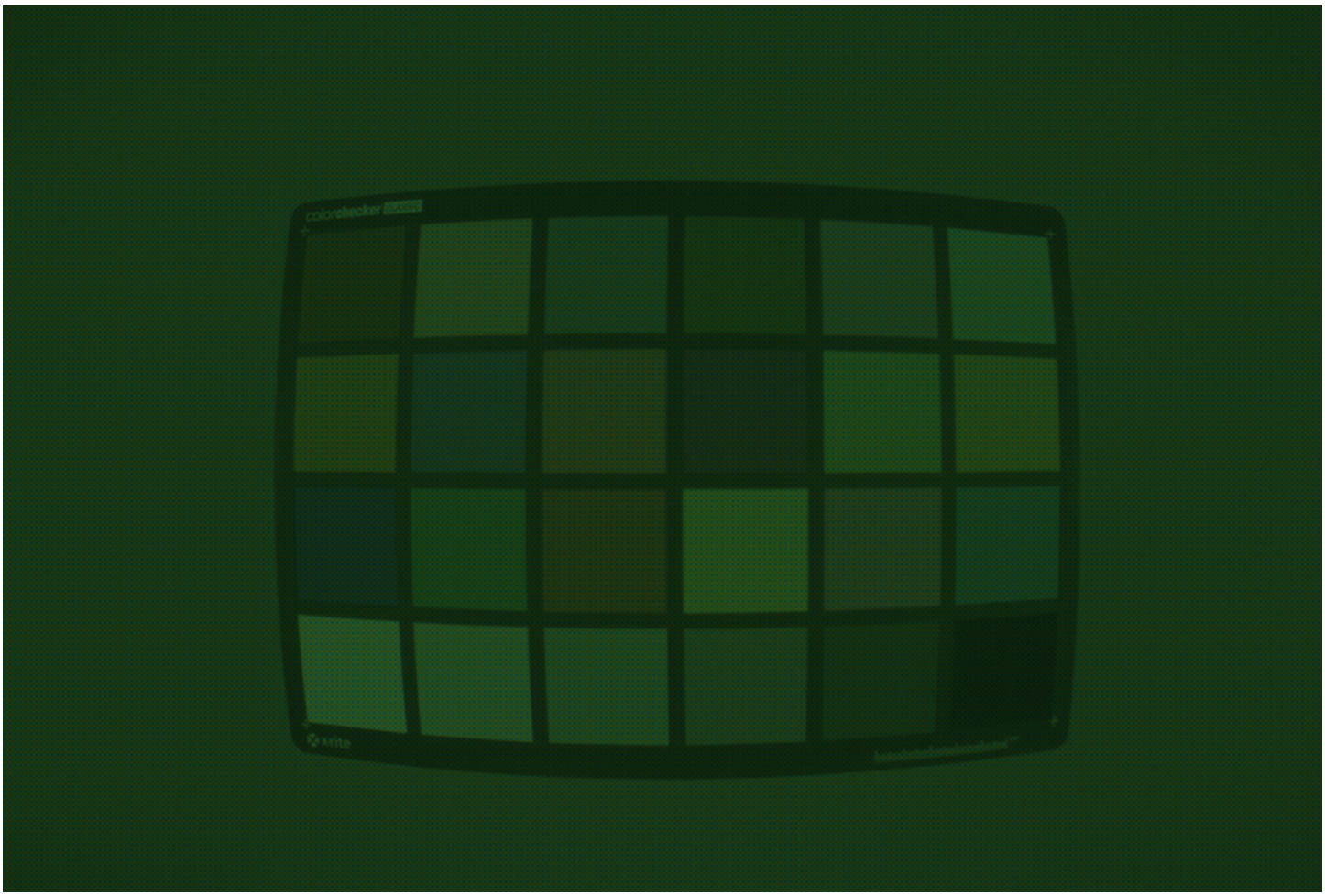
Assignment 1 - Report

- **Original 12bit Bayer Raw image (Input):**



1920x1280x12bitsxGRBG_6500K_2000Lux.raw in PixelViewer

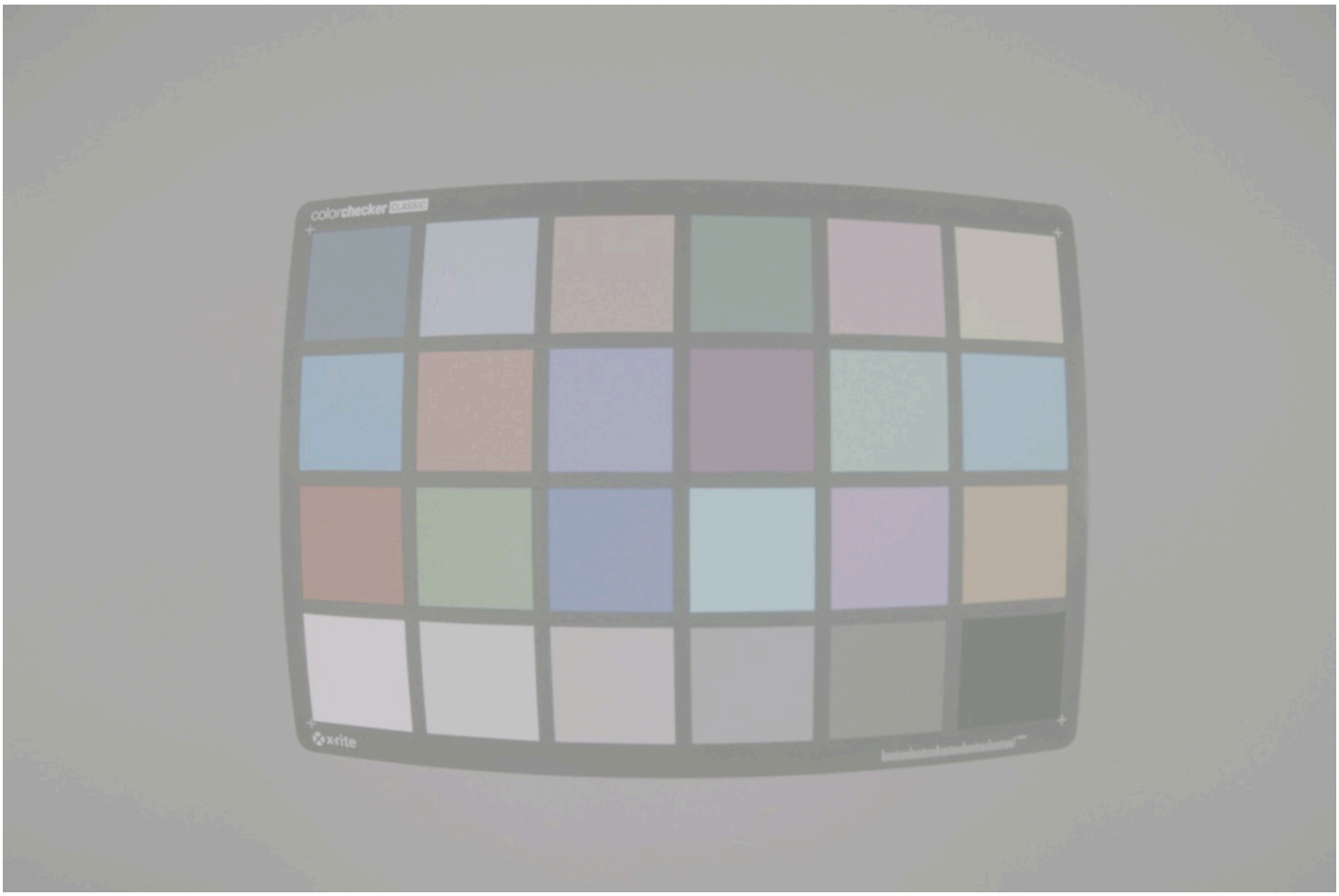
1. **Demosaic + Gamma**

- **Process**: The raw Bayer image is demosaiced into an RGB image, then gamma correction is applied to adjust the brightness and contrast.
- **Outcome**: The image appears with better color representation due to demosaicing, and gamma correction will improve the tonal balance of the image.
- **Summary Observation**: This combination should give a clearer, more balanced image, especially in terms of contrast, but the image might still lack some refinement like denoising and sharpening.

Demosaic + Gamma

2. Demosaic + White Balance + Gamma

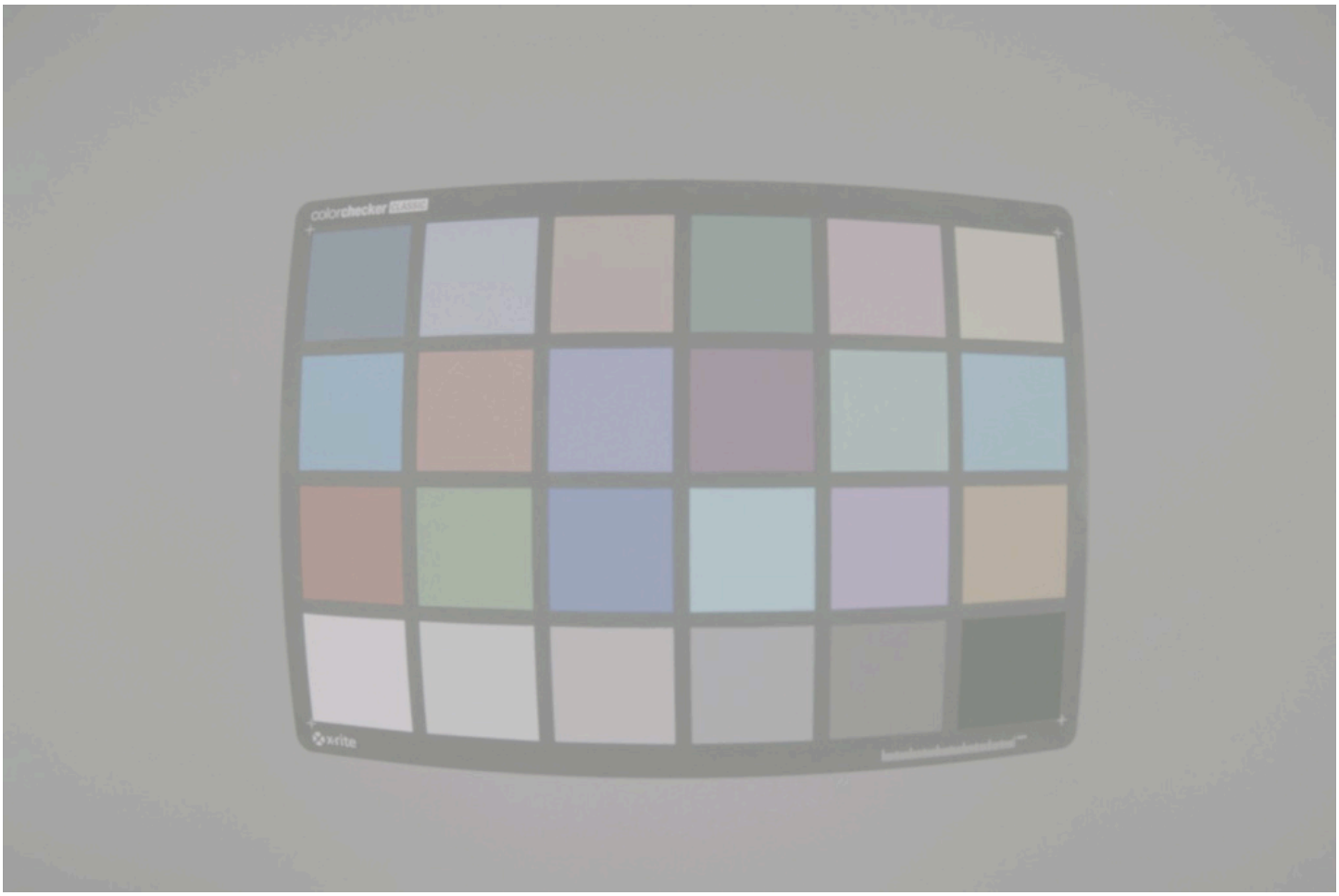
- **Process:** After demosaicing, the image undergoes white balance adjustment based on the Gray World algorithm, followed by gamma correction.
- **Outcome:** This combination corrects color casts, making the image more natural in terms of color temperature, while gamma correction adjusts brightness.
- **Summary Observation:** The image should look more balanced in terms of both color and tonal range. White balance can significantly improve the color accuracy, and gamma will ensure proper exposure.



Demosaic + White Balance + Gamma

3. **Demosaic + White Balance + Denoise + Gamma**

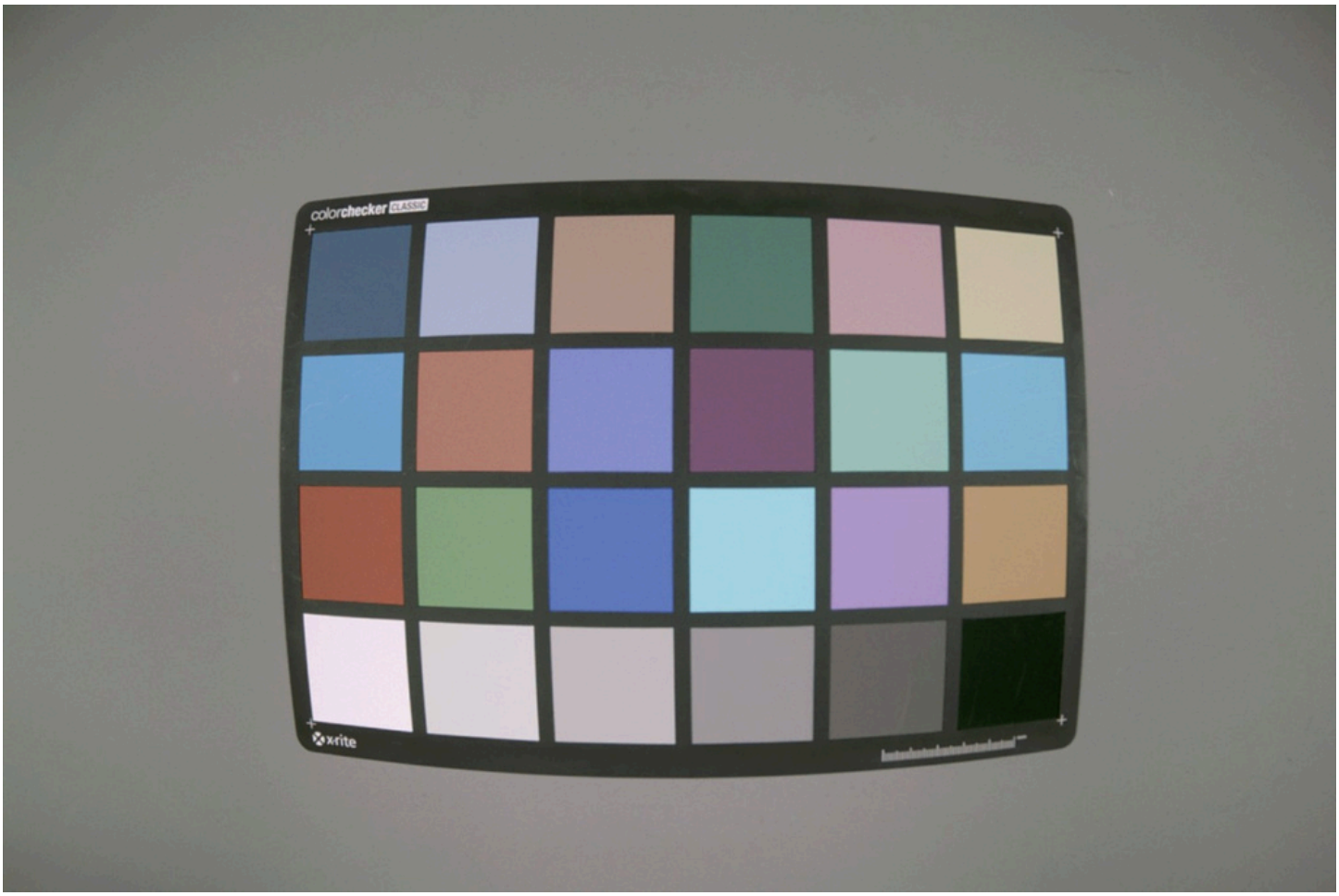
- **Process**: This sequence first demosaics the image, then adjusts white balance, applies denoising, and finally applies gamma correction.
- **Outcome**: The denoising step smooths out any remaining noise, making the image clearer, and the other steps will ensure proper color and tonal balance.
- **Summary Observation**: This should produce a smoother, more professional-looking image with better color accuracy and reduced noise, as well as appropriate contrast and brightness.



Demosaic + White Balance + Denoise + Gamma

4. **Demosaic + White Balance + Denoise + Gamma + Sharpen**

- **Process**: After demosaicing, the image will undergo white balance, denoising, gamma correction, and finally sharpening.
- **Outcome**: The image will have the most refined quality, with better color accuracy, reduced noise, proper contrast, and enhanced sharpness.
- **Summary Observation**: This combination will result in the sharpest and clearest image with the most balanced colors and reduced noise. However, sharpening may introduce artifacts if overdone.



Demosaic + White Balance + Denoise + Gamma + Sharpen