**Assignment1**

**September 13rd Tengfei Jiang**

Problem1:Thresholding

Background pattern

Description automatically generated1.Threshold1:

2.Threshold2:

Icon

Description automatically generated

Problem 2 Contrast/Inversion

1.Increase the brightness by 10% by subtracting the value of 25:



Decrease the brightness by 10% by subtracting the value of 25:

A picture containing dark, image

Description automatically generated

2.invert the color

The result made by imcomplement() is the same as the result made by pixel processing

Background pattern

Description automatically generatedBackground pattern

Description automatically generated

Problem 3: Quantization

1. 8 levels:

Background pattern

Description automatically generated

1. 16 levels

**Background pattern

Description automatically generated**

Problem 4: Sampling

1. By the factor of 2:

Background pattern

Description automatically generated

1. By the factor of 7

A large group of people

Description automatically generated with medium confidence

Playing with a Camera:

I took 20 pictures with my EOS R6 camera and size of files are too big to be submitted within the zip file.

If the original images is required, please let me know.

1. Mean Image:

A picture containing wall, indoor

Description automatically generated

1. Deviation image:

Diagram

Description automatically generated

1. Maximum Difference from the mean image, How big is this? Does it depend on the mean?

MD(R,G,B)=50,46,48;

It is not dependent on the mean image.

1. Distribution of pixel intensity, why does it look like that?

As following: R,G,B channel distribution and the 4th picture is the gray image intensity distribution:eChart

Description automatically generatedChart

Description automatically generatedChart

Description automatically generatedChart

Description automatically generated with low confidence

The distribution of pixel intensity looks like Normal Distribution. Under the same (at least very similar) illumination condition, the color intensity which collected by CMOS can be seen as a real-valued random variable.