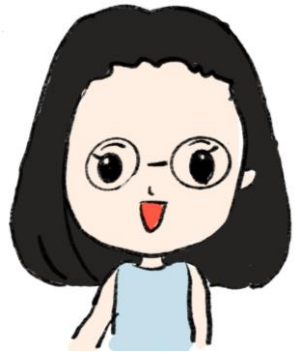
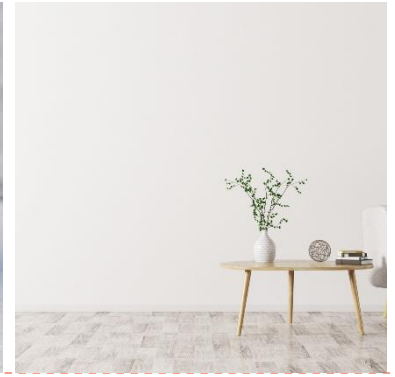
Activity#1

Pixel Structure and Quality



Activity#1



1.1 : Image Color Order with different libraries

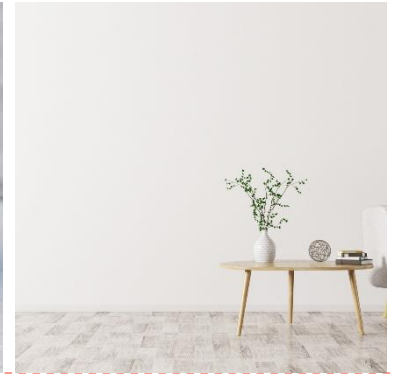
1.2 : Image Reshape

1.3 : Reduce Bit Depth using Quantization

1.4 : 3D Image Surface

Activity#1



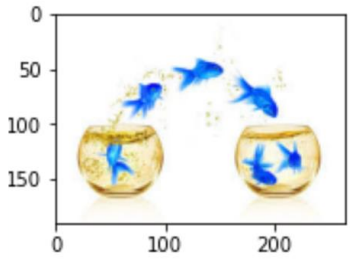
```
import cv2
import numpy as np
import math
import matplotlib.image as mpimg

%matplotlib notebook
from matplotlib import pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
```

1.1 : Image Color Order with different libraries

- Reorder Image Color

Read Image

- Matplotlib
- OpenCv

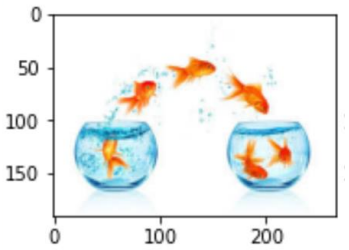


Display Image

- Subplot()
- Imshow()
  - From matplotlib
  - From openCV

Make correction

- Reorder color channel from OpenCV
  - Cv2.cvtColor()
  - Numpy reorder channel element



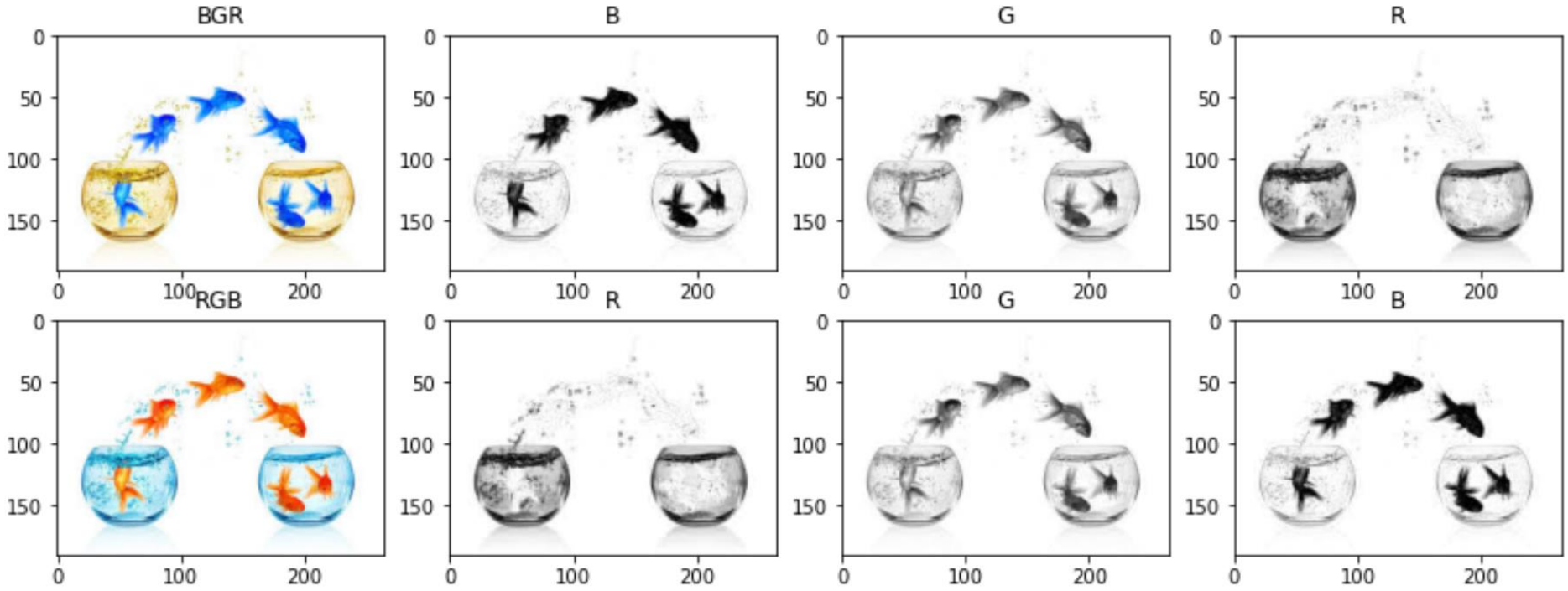
Display Image

- Subplot()
- Imshow()
  - From matplotlib
  - From openCV

BGR vs RGB

From OpenCV
BGR

From numPy
Reorder
channel
Element
RGB



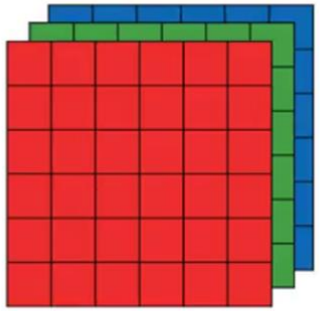
Grayscale image use cmap = 'gray'

1.2 : Image Reshape

- Reorder Channel

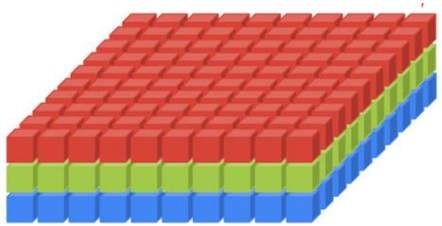
Reshape Channel

- From
- (height, width, channel)



Numpy

- transpose()
- moveaxis()



Result

- To
- (channel, height, width)

1.3 : Reduce Bit Depth using Quantization

- Reduce Image Bit Depth (Quality)

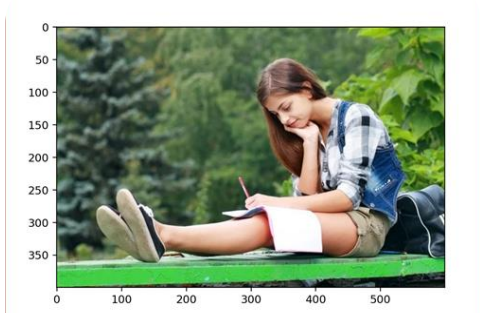
$$Qlevel = 2^{Bit\_Depth}$$

$$Q = floor(NormValue(Si) * Qlevel)$$

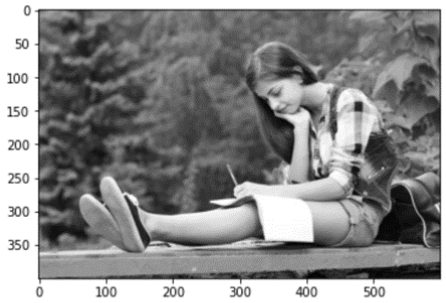
$$= floor\left(\left(\frac{Si - Smin}{Smax - Smin}\right) * Qlevel\right)$$

1.4 : 3D Image Surface

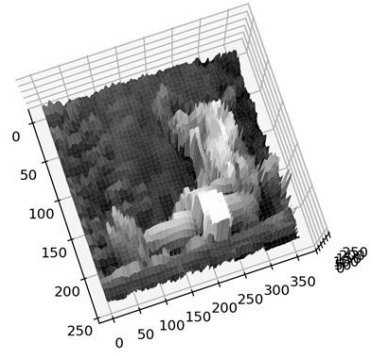
- 3D Image Surface



2D Image



- Convert to grayscale image
- Reduce Dimension
- Cv2.resize()



3D Surface Display

- Meshgrid สร้าง array พิกัดตำแหน่งพิกเซล
  - numpy.mgrid()
- 3D surface plot
  - plot_surface()