

Machine Vision

HW#1

Deadline: 2023/03/23 23:59

RVL Room 1421

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HW#1

1. Image Quantization (binary, gray, index-color)

1-1. Convert the color image to grayscale image

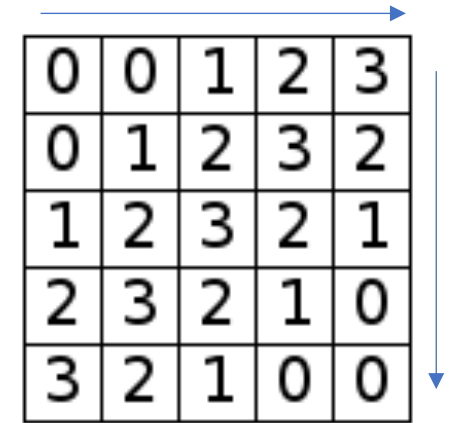
- Formula: $(0.3 * R) + (0.59 * G) + (0.11 * B)$

1-2. Convert the grayscale image to a binary image

- Threshold = 128

1-3. Convert the color image to index-color image

- Define the Colour map of 256 type colors by your own.



0	0	1	2	3
0	1	2	3	2
1	2	3	2	1
2	3	2	1	0
3	2	1	0	0

0 = [120, 251, 112]

1 = [88, 57, 52]

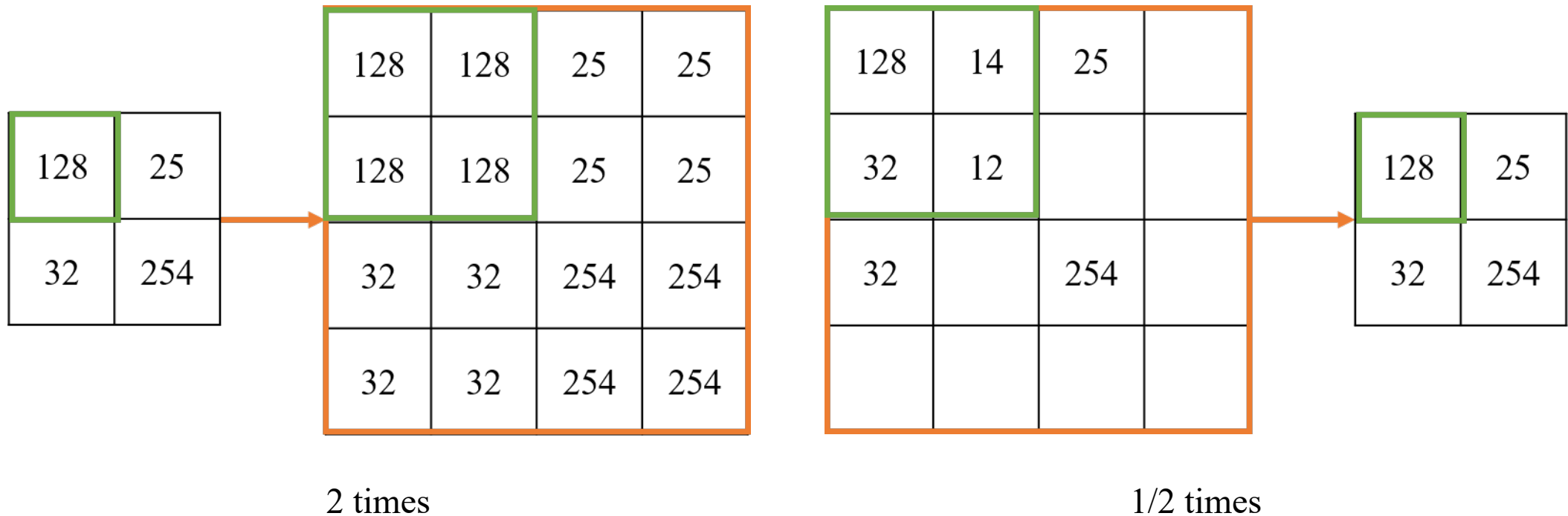
2 = [148, 24, 12]

3 = [69, 253, 145]

HW#1

2. Resizing image

2-1. Resizing image to 1/2 and 2 times without interpolation.



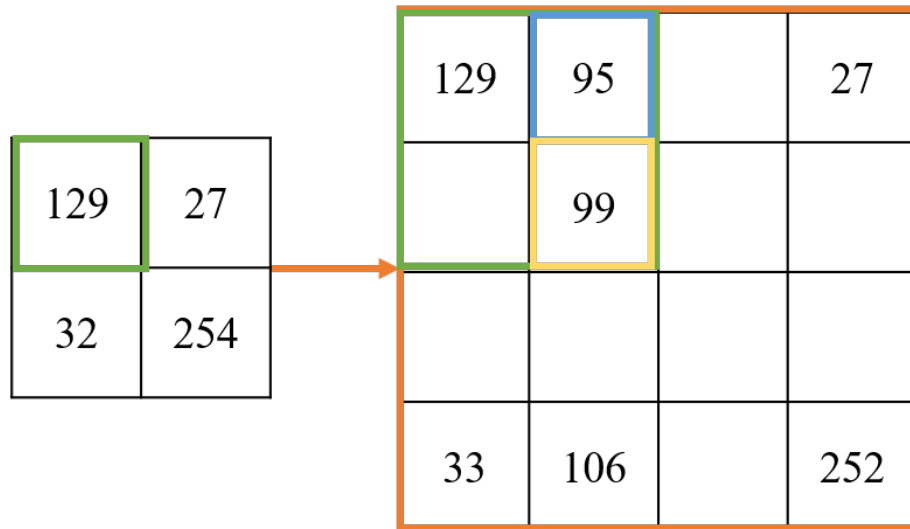
HW#1

2. Resizing image

2-2. Resizing image to 1/2 and 2 times with interpolation (round)

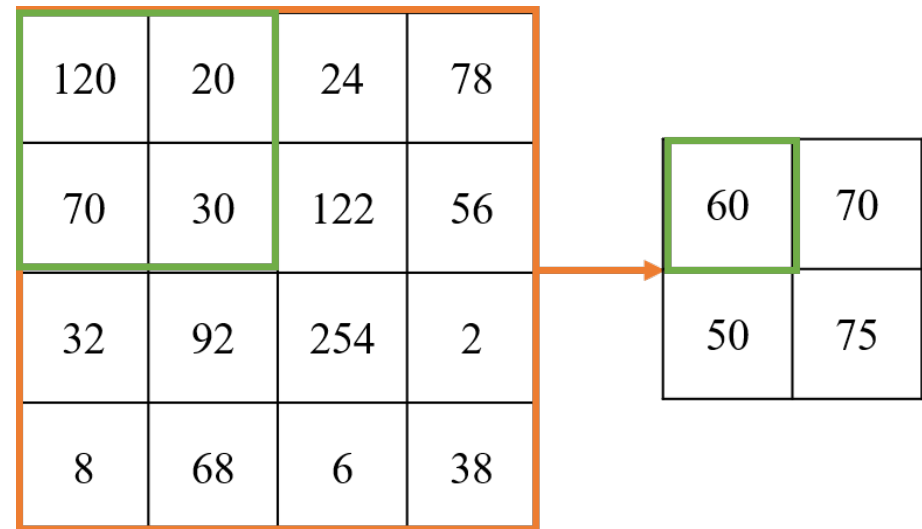
- You can use Bilinear interpolation or Bicubic interpolation etc.

$$129 \cdot (2/3) + 27 \cdot (1/3) = 86 + 9 = 95$$



$$95 \cdot (2/3) + 106 \cdot (1/3) = 63.2 + 35.3 = 99$$

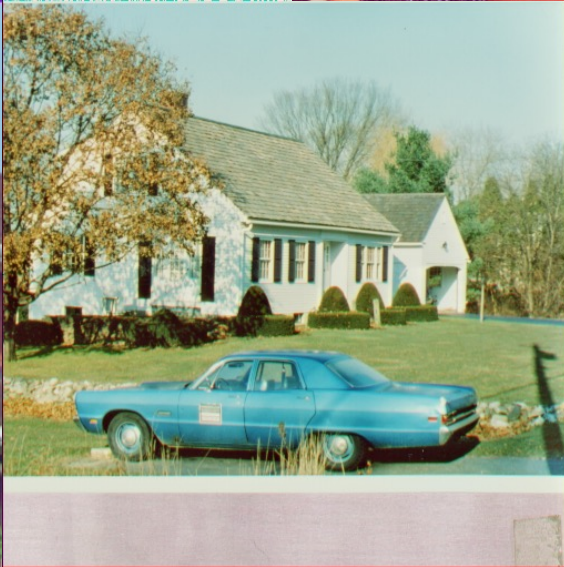
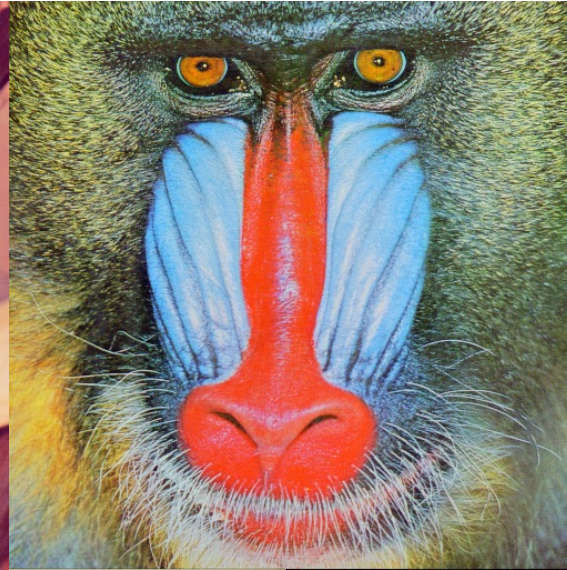
2 times



1/2 times

HW#1

- [Download images](#)



HW#1

- Use OpenCV-2.x version
- Allow use OpenCV for C/C++
 - Read, load, save, show: `cvLoadImage`, `cvShowImage` ...
 - Define size of image: `cvSize`, `cvGetSize`
 - Define image: `IplImage` or `Mat`
- Not Allow use
 - Cannot use the function of OpenCV Lib to do the main part of homework.
 - Example:
 - `cvtColor(image, gray, CV_RGB2GRAY); // convert RGB to Gray`

HW#1

- Require for program
 - GUI to read, display input and result images is encouraged (but not required).
 - Use C/C++
 - Write homework on the one program (using class or subprogram).

HW#1

- Grade
 - Program (80%)
 - Q1 (48%)
 - Q2 (32%)
 - Report (20%)

HW#1

- Report needs:
 - Student ID
 - Name
 - Describe the main part of your method
 - Result images (42 pics)
 - 1-1 6 images
 - 1-2 6 images
 - 1-3 6 images and colour map
 - 2-1 6*2 images
 - 2-2 6*2 images

HW#1

- Submit **studentID_hw1.zip** include:
 - The program source code and result images
 - The report (.pdf)
 - Mail to TAs
- **Deadline: 2023/03/23 23:59**
 - For each hour late, 10% of the total possible points will be deducted.
 - Don't share your code with other students.