Digital Image Processing (2023)

Homework 1

{Image input/flip/output + Resolution + Scaling}

Deadline: 112.10.19

Image input/flip/output (30%)

Using C++ or C, read, flip horizontally and write the images of BMP format. Please notice Bit Depth of the images.

input1.bmp

output1_flip.bmp

[Input]	input1.bmp	input2.bmp
[Output]	output1_flip.bmp	output2_flip.bmp

Resolution (30%)

Using C++ or C, accomplish the discussion of Quantization Resolution.

[Input]	input1.bmp	(3*8bits)	input2.bmp	(4*8bits)
[Output]	output1_1.bmp	(3*6bits)	output2_1.bmp	(4*6bits)
	output1_2.bmp	(3*4bits)	output2_2.bmp	(4*4bits)
	output1_3.bmp	(3*2bits)	output2_3.bmp	(4*2bits)

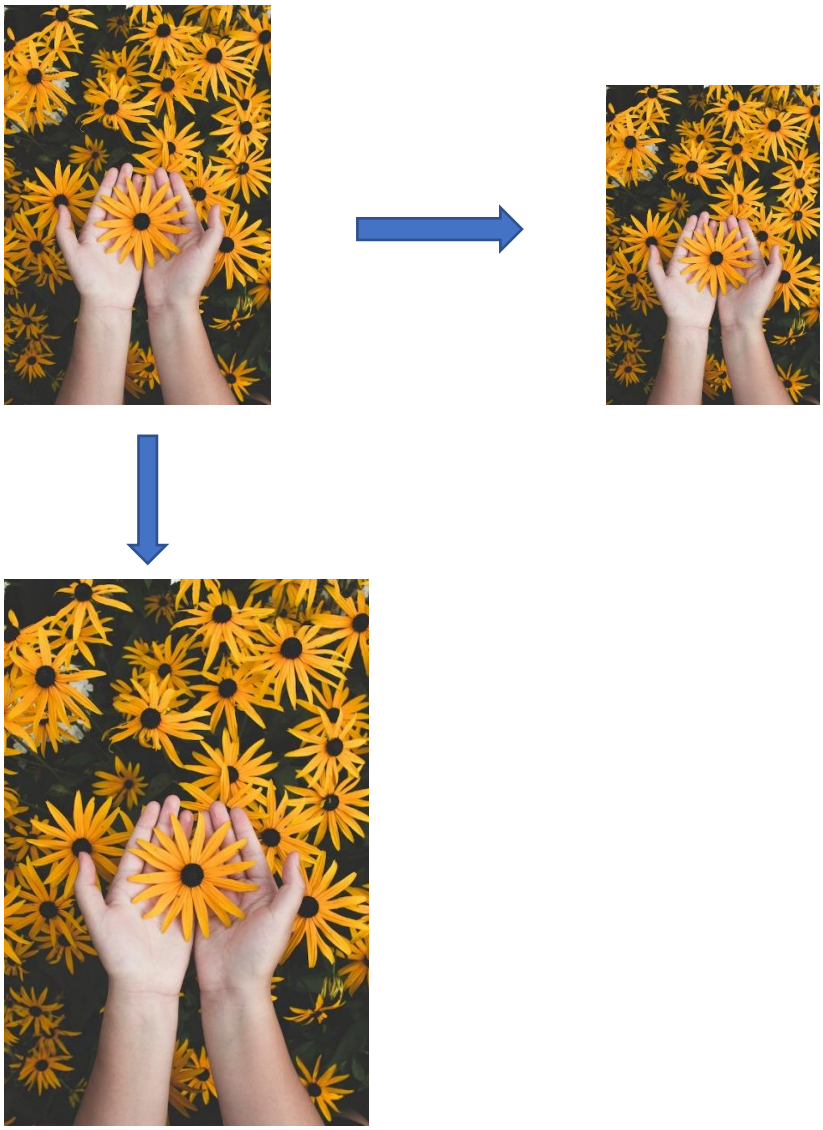
output1_1.bmp

output1_2.bmp

output1_3.bmp

Scaling (40%)

Using C++ or C, accomplish Up-scaling and Down-scaling by Bilinear Interpolation with rate 1.5.



[Input]	input1.bmp	input2.bmp
[Output]	output1_up.bmp	output2_up.bmp
	output1_down.bmp	output2_down.bmp

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Homework Rules and Grading Policy

Homework will be graded by:

1. Correctness (70%)
2. Report (30%)

Image input/flip/output

- Explain BMP format in most 2 pages (A4).

Resolution

- Do some discussion and explain how you do it in most 1 page (A4).

Scaling

- Explain how Bilinear interpolation works in most 1 page (A4).

Demo:

Lab634

Upload:

[web] E3

[File Name] hw1_StudentID.zip (ex: hw1_123456789.zip)

- report in the format of .pdf.
- three C, C++ codes with comments.
- ReadMe.txt file which describes how to run your program.
- all output images.

Remind:

Deadline

If you have a late submission by 1 to 7 days, you will only get 70% of the score.

We DO NOT accept any late submission after 7 days after the deadline.

Test failure

We will use other images for testing, and if the test does not pass, half of the score will be deducted, but there is a chance for remediation.