



Dash - MiniCV

MiniCV

*Summary: bitmap, image processing*

# **Contents**

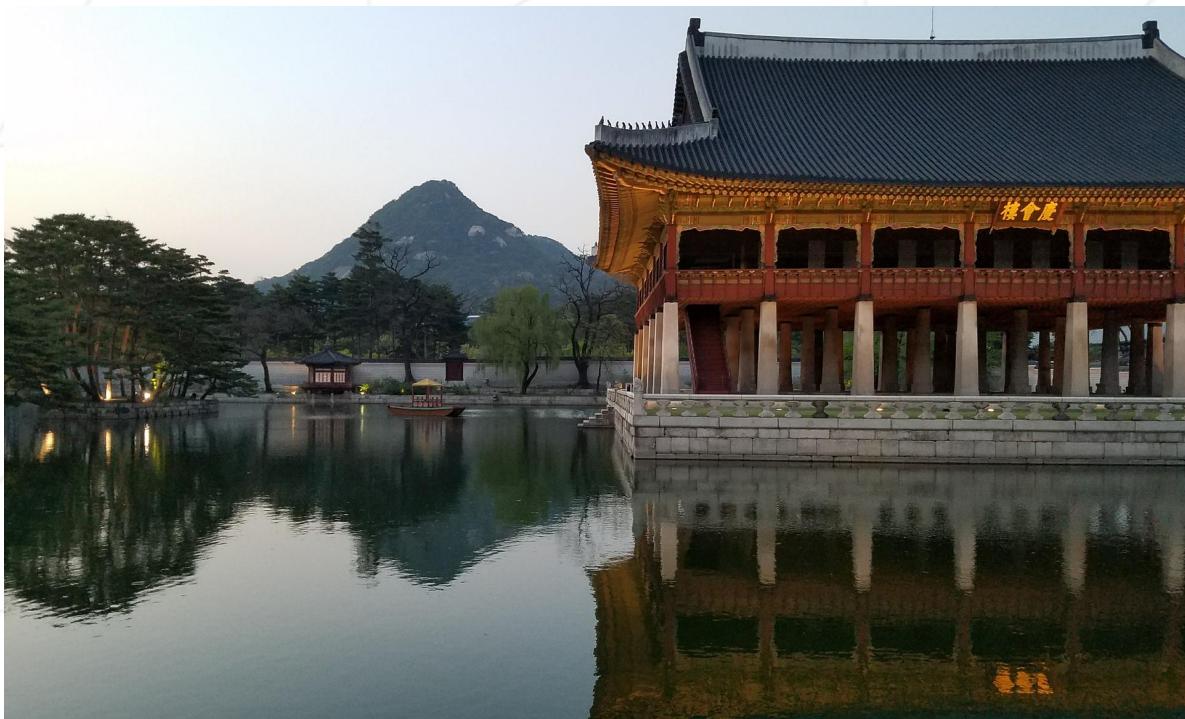
<b>I</b>	<b>Introduction</b>	<b>2</b>
<b>II</b>	<b>General rules</b>	<b>3</b>
<b>III</b>	<b>Mandatory part</b>	<b>4</b>
III.1	Exercise 00: RGB to BGR . . . . .	4
III.2	Exercise 01: Upside down / Right to Left . . . . .	6
<b>IV</b>	<b>Bonus part</b>	<b>7</b>

# Chapter I

## Introduction

Image processing is already used in many fields. Medical field, Transmission and encoding, Robot vision, Pattern recognition etc. Did you know that you can handle bitmap images in C without using OpenCV? This project offers you an opportunity to learn about bitmap structure and image processing basics. We will provide the bitmap image you will use for the project.

The beautiful palace in the picture is Gyeongbokgung Palace in South Korea. Gyeongbokgung Palace was built in 1395, burned down by the war in 1592, and re-built in 1868. Although most of the buildings in the palace have disappeared, the main buildings remain, and it is an important historical site where you can check the appearance of the royal palace in South Korea. However, the image of this beautiful Gyeongbokgung Palace is ruined. You need to restore this image.



## Chapter II

### General rules

- Your project must be written in according with the Norm. If you have bonus files/functions, they are included in the norm check and you will receive a 0 if there is a norm error inside.
- Your functions should not quit unexpectedly (segmentation fault, bus error, double free, etc) apart from undefined behaviors. If this happens, your project will be considered non functional and will receive a 0 during the evaluation.
- All heap allocated memory space must be properly freed when necessary. **No leaks will be tolerated.**
- If the subject requires it, you must submit a Makefile which will compile your source files to the required output with the flags -Wall -Wextra and -Werror, and your Makefile must not relink.
- Your Makefile must at least contain the rules \$(NAME), all, clean, fclean, and re.
- We encourage you to create test programs for your project even though this work won't have to be submitted and won't be graded. It will give you a chance to easily test your work and your peers' work. You will find those tests especially useful during your defense. Indeed, during defense, you are free to use your tests and/or the tests of the peer you are evaluating.

# Chapter III

## Mandatory part

### Exercise 00: RGB to BGR

	Exercise : 00
Program name :	RGB2BGR
Turn-in directory :	<i>ex00/</i>
File to turn in :	Makefile, *.c */*.c, *.h, */*.h
Allowed functions :	fopen, fread, fwrite, fclose, fprintf, fseek, malloc, free, exit
Description :	Restore the given bmp file to the original image

The color of the picture has changed.

Write a program that restores the original picture.

Your program must save the **original.bmp** file.

The evaluation is conducted by comparing the original bitmap file with the recovered bitmap file.

Apply the same rule to all subsequent exercises.

We will provide you bitmap structure.



Do you know the **-fpack-struct** compiler flag?

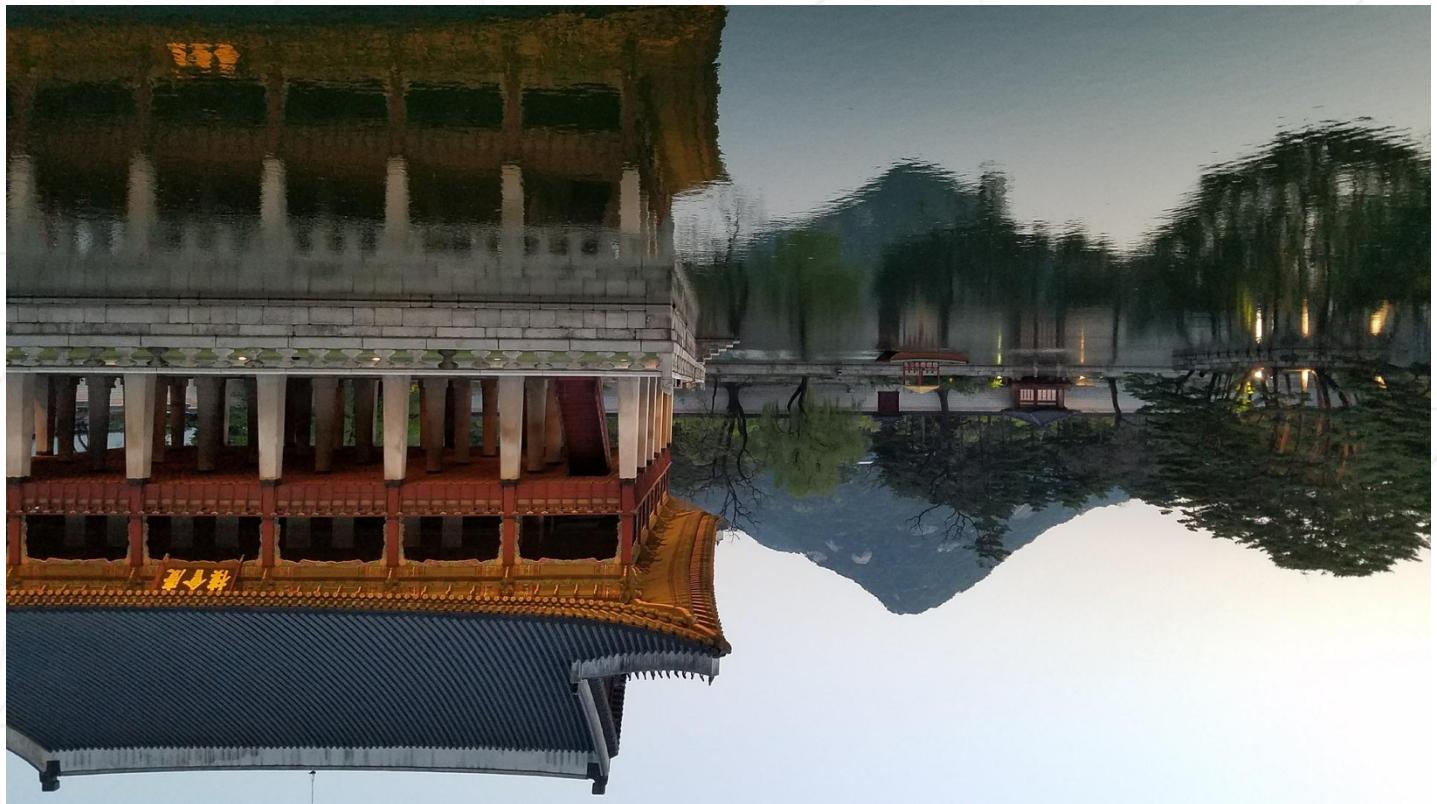
```
typedef struct s_file_header
{
    unsigned short      bf_type;
    unsigned int        bf_size;
    unsigned short      bf_reserved1;
    unsigned short      bf_reserved2;
    unsigned int        bf_off_bits;
} t_file_header;

typedef struct s_info_header
{
    unsigned int        bi_size;
    int                bi_width;
    int                bi_height;
    unsigned short      bi_planes;
    unsigned short      bi_bit_count;
    unsigned int        bi_compression;
    unsigned int        bi_size_image;
    int                bi_x_pels_per_meter;
    int                bi_y_pels_per_meter;
    unsigned int        bi_clr_used;
    unsigned int        bi_clr_important;
} t_info_header;
```



## Exercise 01: Upside down / Right to left

	Exercise : 01
Program name : reverse	
Turn-in directory : <i>ex01/</i>	
File to turn in : Makefile, *.c */*.c, *.h, */*.h	
Allowed functions : fopen, fread, fwrite, fclose, fprintf, fseek, malloc, free, exit	
Description : Restore the given bmp file to the original image	



## Chapter IV

### Bonus part

#### Exercise 02: Zoom in

	Exercise : 02
Program name : zoom	
Turn-in directory : <i>ex02/</i>	
File to turn in : Makefile, *.c */*.c, *.h, */*.h	
Allowed functions : fopen, fread, fwrite, fclose, fprintf, fseek, malloc, free, exit	
Description : Write a program that magnifies a original bitmap file	

You can pass this dash-project without doing exercise 02.

Don't spend too much time on bonus.

There are many ways to zoom in, but the choice is freedom.

Write a program that stores a given bitmap file to double magnification.