C Programming
Programming Homework #2

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Programming Homework

▶ Capture Output Screen & save
  ▶ Alt (Fn)+PrintScrn or Open 그림판 and Ctrl+V
  ▶ 캡처 도구
    ▶ Windows로고키 + Shift키 + S
    ▶ Windows로고키 + R, snippingtool (엔터)
▶ Save Source File
  ▶ PHW2-1.cpp, PHW2-2.cpp, PHW2-3.cpp....
▶ Make Zip Folder
  ▶ Output screen image
  ▶ Source file (*.cpp)
▶ Submit the Zipped Folder to cyber campus

Make It Easy to See

▸ 1 Named Folder per Problem

  ▸ source code and screen captures

▸ File name is "StudentID_이름.zip"
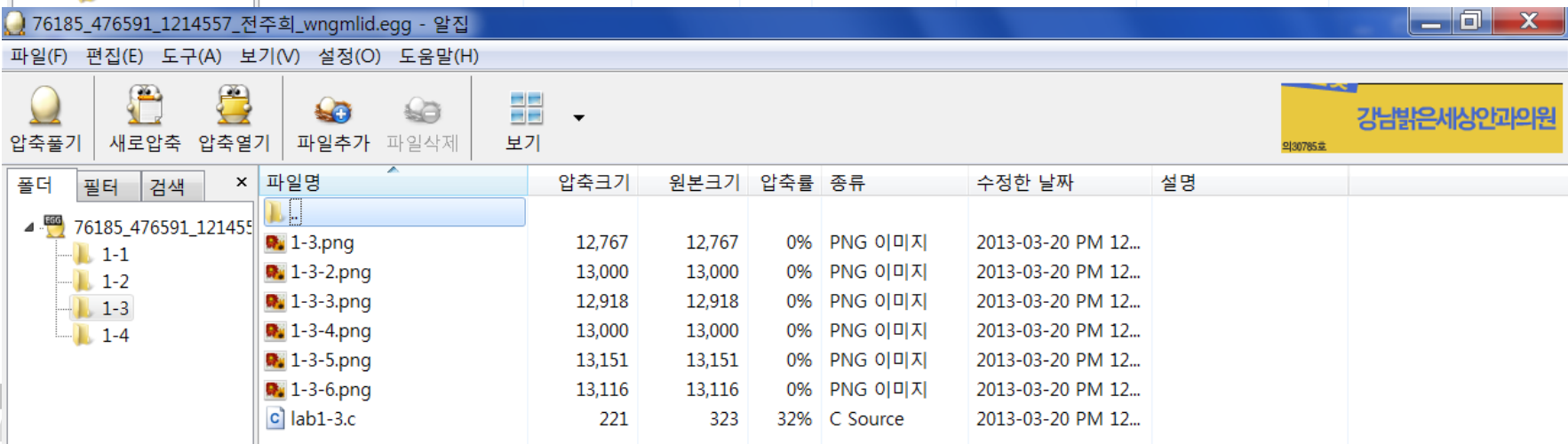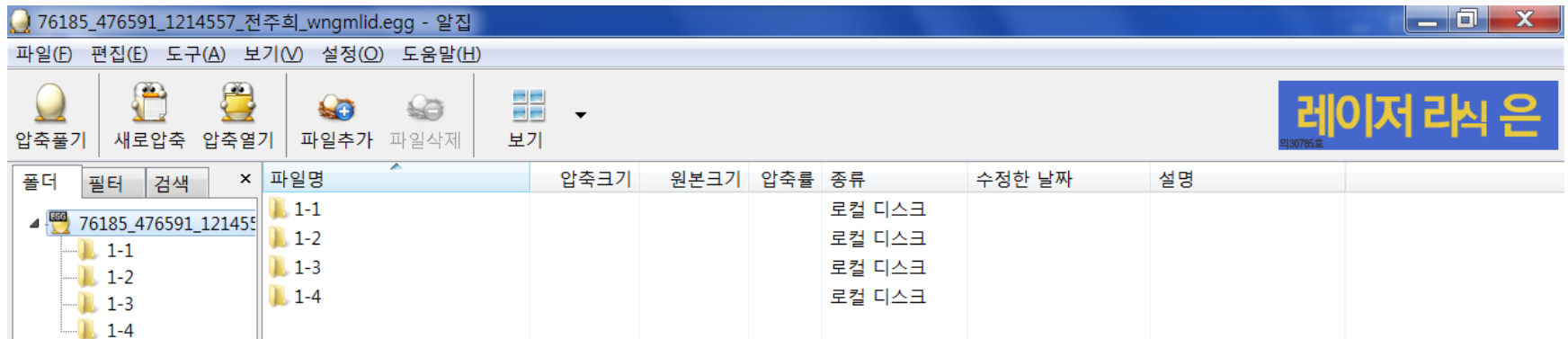
Homework 2

- Due date?
  - Next Monday midnight -5min (4/10, 23:55)
- How to submit?
  - Submit the Zipped Folder to CyberCampus
- What to submit?
  - Source file, screen capture result
- How to grade?
  - (Run without error) && (result is correct) = full points
  - If not, you will get partial points.

Homework 2-1 (6 points)

▶ **Textbook exercise #3.22**

3.22 *(Checking if a Number is Prime)* A prime number is any natural number greater than 1 that is divisible only by 1 and by itself. Write a C program that reads an integer and determines whether it is a prime number or not.
(using loop)

Homework 2-2 (6 points)

▶ **Textbook exercise #3.38**

3.38. *(Counting 9s)* Write a program that reads an integer and determines and prints how many digits in the integer are 9s. (using loop)

▶ **Variation of Textbook exercise #3.45**

3.45. ***(Factorial)*** The factorial of a nonnegative integer n is written $n!$ (pronounced "n factorial") and is defined as follows:

$n! = n \cdot (n-1) \cdot (n-2) \cdot \cdots \cdot 1$ (for values of n greater than or equal to 1)

and

$$n! = 1 \text{ (for } n = 0)$$

For example, $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$, which is 120. Write each of two programs about the followings (using loop).

a) Write a program that reads a nonnegative integer and computes and prints its factorial. (4 points)
b) (Continued in the next page)

b) Write a program that estimates the value of the mathematical constant e by using the formula:

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \cdots$$

and discuss how many terms should be calculated to precisely estimate e by double data type.
(upto the last fractional digit when `printf` using "%lf")
(6 points)

▶ Textbook exercise #4.31

4.31. *(Diamond-Printing Program)* Write a program that prints the following diamond shape. You may use `printf` statements that print either a single asterisk (*) or a single blank. Maximize your use of iteration (with nested `for` statements) and minimize the number of `printf` statements.

```
        *
       ***
      *****
     *******
    *********
   ***********
    *********
     *******
      *****
       ***
        *
```

```
#include <stdio.h>

void main() {
    printf("    *\n");
    printf("   ***\n");
    printf("  *****\n");
    printf(" *******\n");
    printf("*********\n");
    printf(" *******\n");
    printf("  *****\n");
    printf("   ***\n");
    printf("    *\n");
}
```

Codes similar to this one would get 0 point.