Advanced C Programming – Homework #1

Prof. Cheolsoo Park

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Problem 1

↗ Write a program that get input from a user for an integer value of x, y dimension 2 points(1,3) for print area of rectangle shape and also print another 2 points(2,4) that can construct rectangle.

Input the first point x : 0
Input the first point y : 0

Input the third point x : 10
Input the third point y : 5

AREA : 50

Point 2 : (10,0)
Point 4 : (0,5)

point4   point3

point1   point2
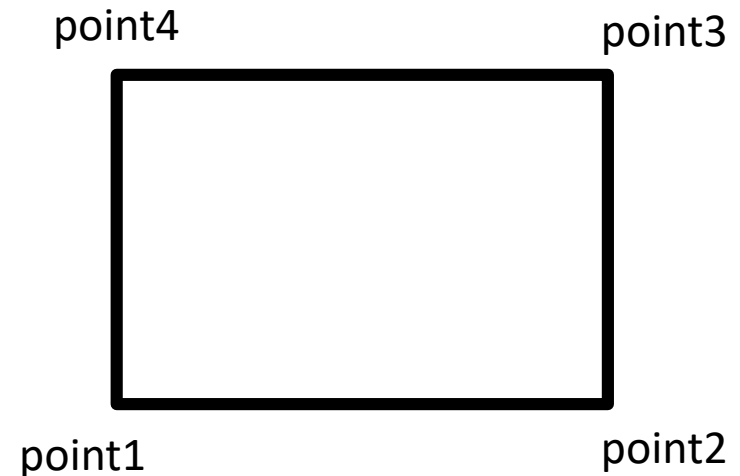
Problem 2

↗ Write a program that get input from a user for an integer value in the range 0 to 50,000 and then prints the individual digits of the numbers on a line with tap between the digits. The first line is to start with the leftmost digit and print all five digits; the second line is to start with the second digit from the left and print four digits, and so forth. For example, if the user enters 5234, your program should print

```
input number(0~50,000) = 5234
0        5        2        3        4
5        2        3        4
2        3        4
3        4
4
```

Problem 3

↗ Enter a range (0 to 2000) from the user and obtain the count of each digit numbers. (0~9)

Input range(first) : 0
Input range(second) : 15

0: 2
1: 8
2: 2
3: 2
4: 2
5: 2
6: 1
7: 1
8: 1
9: 1

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Problem 4

↗ Write a program that produce random 4x4 array that range between 0~30 and find the maximum value of the two consecutive digits multiplication of the up, down, left, right, or diagonally.

```
Random 4X4 array :

01 05 10 20
24 30 00 02
00 11 12 03
21 22 05 23

Biggest product :

24 X 30 = 720
```

Problem 5

↗ Write a program that reads values of a matrix. The user inputs 2 matrices of 3x3. The program performs addition, subtraction, and multiplication and shows results. If an inverse matrix of the first matrix exists, the program computes and shows it. Each matrix element should be a floating-point number.

```
Input the first matrix
(a  b  c)
(d  e  f)
(g  h  i)
:: 3 4 1 -2 4 6 4 -3 2

Input the second matrix
(a  b  c)
(d  e  f)
(g  h  i)
:: 1 1 2 2 9 -4 4 3 5

A =
(3  4  1)
(-2  4  6)
(4  -3  2)

B =
(1  1  2)
(2  9  -4)
(4  3  5)

A + B =
(4  5  3)
(0  13  2)
(8  0  4)
...
```