CSE2011 Problem Solving, 2016 Spring

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**Homework 1 (100 points): 2015/3/3**

**Due date: 2015/3/14 23:59 (submission to icampus)**

**Programming (coding) rules**

* A program for each assignment should be included in a single C file. You cannot use any non-standard library unless it is included in the file.
* Do not include any other natural language than English in your code.
* Indent properly. Use meaningful names of variables.
* Write sufficient comments.
* Follow the instruction for the file name: Yourid\_HWx.c For example, if your id is 2000123456 and the number of homework is 1, the file name should be 2000123456\_HW1.c
* Submit your file to HWx-Programming in <http://www.icampus.ac.kr>
* Your code should work with the following complier: http://ideone.com/

**Report rules**

* You can use Korean or English.
* Follow the instruction for the file name: Yourid\_HWx.yy For example, if your id is 2000123456, the number of homework is 1, and your report file type is MS word, the file name should be 2000123456\_HW1.docx
* Submit your file to HWx-Report in <http://www.icampus.ac.kr>

**Problem: Finding k**

There is an N\*N matrix. All elements in each row and column are sorted in an ascending order.

1. Find a single k efficiently (minimum access of elements). If there are multiple k, you need to find **ANY SINGLE** k.
2. Find all k efficiently (minimum access of elements). If there are multiple k, you need to find **ALL** k.

(Example)

Input: 5 \* 5 matrix, k=7,

Output: (2,1), (0,3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 5 | 6 | **7** | 25 |
| 2 | 6 | 8 | 16 | 27 |
| 3 | **7** | 14 | 18 | 28 |
| 4 | 8 | 15 | 21 | 30 |
| 10 | 11 | 20 | 23 | 50 |

**HW1 – in your C code:** Submit a source file whose name is Yourid\_HW1.c For example, if your id is 2000123456, the file name should be 2000123456\_HW1.c

* You need to implement cal\_single() and cal\_all() functions; do not modify and use main() and other parts. You can allow to modify cal\_single() and cal\_all() functions ONLY. (No global variables…)
* TA will copy your code in cal\_single() and cal\_all() to the template code; other parts will not be copied.
* Your C code should work with any size (with LENGTH not more than 100) input array.
* Insert comments for all codes including main().
* TA will test your program in http://ideone.com/

**HW1 – in your report**: Submit a report whose file name is Yourid\_HW1.yy For example, if your id is 2000123456 and your report file type is MS word, the file name should be 2000123456\_HW1.docx

* Explain your algorithm with a 10\*10 matrix example.