Level 2 Programming

Duration : 3 hrs

- All programs carry equal marks.
- All programs can be coded using java / c / c++.
- Unless specified, all programs should have a generic logic and should work for any given input other than the one specified in the examples.

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1) Print a given n*m array in the below format. If the starting position is in the top row, then the direction should be downward from that position and the pattern should continue. If the starting position is at the bottom row, then the direction should be upward from that position and the pattern should continue.

5	6	15	16	25
4	7	14	17	24
3	8	13	18	23
2	9	12	19	22
1	10	11	20	21

Input : Starting Position : {4,0}
Output : 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25.

Input : Starting Position : {4,1}
Output : 10,9,8,7,6,15,14,13,12,11,20,19,18,17,16,25,24,23,22,21,1,2,3,4,5

Input : Starting Position : {0,3}
Output: 16,17,18,19,20,21,22,23,24,25,5,4,3,2,1,10,9,8,7,6,15,14,13,12,11

2). Find out the biggest possible palindrome using the characters of a given set of words. If multiple palindromes of the same size could be formed, then it is enough if one of them is printed.

Input : This is a Sample text for testing.
Output : Max possible palindrome : 15 characters
Ex : ttissaepeassitt

3) Write a program to form lines using the given set of words. The line formation should follow the below rules.

i) Total characters in a single line excluding the space between the words and the favorite character should not exceed the given maximum number

ii) Favorite character is case insensitive. i.e, if the favorite is specified as 'd' then both 'd' and 'D' should be left out while counting.

iii) Words should not be broken up. Complete words alone should be used in a line. A word should be used in one line only.

Input :

Max char per line : 10

Favorite character : o

Words : Zoho,Eating,Watching,Pogo,Loving,Mango

Output :

Watching Zoho (10)

Eating Mango (10)

Loving Pogo (7)

Input:

Max char per line : 15

Favorite character : w

Words : Twinkle,Twinkle,little,star,how,I,wonder,what,you,are

Output :

Twinkle Twinkle what (15)

little wonder star (15)

you are how I (9)

4). Write a program to find out a set of valid sub arrays from a given array. The window size of the sub array should be configurable. The output of each sub array should be formed by finding the maximum value in each position (i.e units, tens, hundreds, thousands position etc...).

Example : If the sub array is {36,145,67,1004} then the biggest units place among these is 7, the biggest digit in tens place is 6 etc.... So the derived number from this array would be 1167.

A sub array is considered valid only if it has a favorite number in it. (the number can be in any position). The list of valid and invalid sub arrays should be printed at the end.

Example Input

Input Array : {35,145,67,1004,88,456,2034}

Window size : 3

Favorite number : 8

Output :

{35,145,67} : 167

{145,67,1004} : 1167

{67,1004,88} : 1088

{1004,88,456} : 1488

{88,456,2034} : 2488

Arrays {67,1004,88}, {1004,88,456}, {88,456,2034} are valid arrays

Arrays {35,145,67}, {145,67,1004} are invalid arrays

5). Write a program to find two adjacent numbers from a given matrix that when added gives the desired output. The numbers can be adjacent either horizontally, vertically or diagonally.

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

If the sum of two numbers is specified as 10, then the output should be

4 + 6 : 10
7 + 3 : 10
7 + 3 : 10
6 + 4 : 10
3 + 7 : 10
8 + 2 : 10
6 + 4 : 10