CMP-210 Data Structures and Algorithms
BS Fall 2018
Quiz 1 – Online KEY

Roll-No: _ _ _ _ _ _ _ _ _ _ _ _

Issue Date: 22-Mar-2020
Marks: 15
Submission Date/Time: 23-Mar-2020 before 20:00 hours

Objective:

- This quiz will check your status of learning so far in the course by asking questions from easy to difficult based on knowledge learned so far.

Challenge-A: (9): 2,2,3,2)

Part-A

Time = O(N)
Space = O(N)
Where N is the string length

Part-B

(i-S)*B*C + (j-S)*C + (k-S)

Part-C

One of the possible layout/mapping for given N Order Matrix.

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

Assume: i = given row index
j = given column index

Mapping according to the layout depicted above:

```
if ( j==0 )
        i
else if ( j==N-1 )
        N + i
else if ( N-i-1 == j )
        2*N + i - 1
```

Part-D

Value	a	b	c	b	x	f	r	k	o	p	y	s	t	y	z	g	h	t	n	m	e
Column_Index	0	2	3	4	7	1	2	3	4	5	1	0	4	2	6	7	0	3	4	7	1

Row_Pointer	0	5	10	11	13	16	-1	20

Challenge-B: (6)

```
int findFirstOccurrence(int arr[], int N, int key)
{
    int lb = 0, ub = N - 1;

    int result = -1;

    while (lb <= ub)
    {
        int mid = lb + (ub-lb)/2;
        if (key == arr[mid])
        {
            result = mid;
            ub = mid - 1;
        }
        else if (key < arr[mid])
            ub = mid - 1;
        else
            lb = mid + 1;
    }
    return result;
}
```