CS 310 'Algorithms' **Homework 5**

Due date: Wednesday, November 6, 2019 at **11:00 AM** in class.

Name: _____ Roll No: _____

You are given a 2-D `nxn` integer array 'A'. Assume n is a power of 2. The rows and columns of A are sorted in ascending order from left to right and top to bottom, respectively. An example of the array is shown below. You have to determine if a given integer value is present in A or not.

1	20	32	49
5	27	36	57
7	28	37	67
9	29	38	76

Describe a Divide and Conquer algorithm for the above problem in clear steps (do NOT write C code). *Illustrate your algorithm using figures.* Don't forget to mention the base case.

Recurrence relation of your algorithm _____

Running time of your algorithm in Big-Oh notation _____

Can you design an algorithm that solves this problem in linear time O(n)?
If yes, then describe it in clear steps (do NOT write C code). *Illustrate your algorithm using figures*.