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# ALGORITHM LAB

## Review of Fundamentals of Data Structure-II

### PROGRAM EXERCISE-2

#### Lab. Exercise(LE):

- 1.1) Let A be  $n \times n$  square matrix array. WAP by using appropriate user defined functions for the following:
- a) Find the number of nonzero elements in A
  - b) Find the sum of the elements above the leading diagonal.
  - c) Display the elements below the minor diagonal.
  - d) Find the product of the diagonal elements.
- 1.2) Write a program using a function for computing  $\lfloor \sqrt{n} \rfloor$  for any positive integer. Besides assignment and comparison, your algorithm may only use the four basic arithmetic operations.
- Hints:** In number theory, the integer square root (isqrt) of a positive integer  $n$  is the positive integer  $m$  which is the greatest integer less than or equal to the square root of  $n$ ,
- $$\text{isqrt}(n) = \lfloor \sqrt{n} \rfloor$$
- 1.3) You have array of size  $N$ , number is range from  $[1 \text{ to } N]$  and one number is missing. Write a program for finding that missing number.
- 1.4) Given key in a sorted array A with distinct values.
- Write a program to find  $i, j, k$  such that  $A[i] + A[j] + A[k] == \text{key}$
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### Home Exercise(HE):

1.5) Suppose an array A has n distinct integers. Increasing sequence is given as

$A[1]....A[k]$  and decreasing sequence is given as  $A[k+1]....A[n]$ .

1.6) Write an algorithm for finding counting inversions in an array. Inversion is a

pair such that for an array  $A = \{a_1, a_2, a_3, ..., a_n\}$ , and  $a_i > a_j$  and  $i < j$ .

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