S.Y. B. Tech. Academic Year 2025-26 Semester: III

CSE20020: Data Structures Laboratory

WRITE UP

Experiment Number: 02

TITLE: Sparse Matrix Operations

PROBLEM STATEMENT:

Write a C program for sparse matrix realization and operations on it- Simple Transpose, Fast Transpose.

OBJECTIVE:

1. To Study the concept of sparse matrix, how it is stored and displayed.
2. To understand the implementation of sparse matrix operations – Simple Transpose, Fast Transpose.

IMPLEMENTATION:

- **PLATFORM:**
  - 64-bit Open source Linux or its derivatives.
  - Open Source C Programming tool like gcc/Eclipse Editor.

- **PSEUDO CODE:** ***//To be Written by Students***

  Write pseudo code for input matrix to compact form, Simple Transpose and Fast Transpose.

- **TIME COMPLEXITY:** ***//To be Written by Students***

  Find out the time complexity of Simple Transpose and Fast Transpose.

- **CONCLUSION:**

  Thus, implemented sparse matrix Operations assignment. This System is able to perform different operations on sparse matrices such as simple and fast transpose and their time complexities.

- **FAQs** *//To be Written by Students*

  a. What is a sparse matrix? List the applications?
  b. Represent sparse matrices with suitable data structures? Explain with an example simple and fast transpose?
  c. Find out the addition of two sparse matrices in triplet form and also find Simple and Fast transpose?

M1 =

4	**5**	**6**
0	3	5
1	3	8
1	4	45
2	3	4
3	2	45
4	1	2

M2 =

4	**5**	**6**
0	3	7
0	4	6
1	4	4
2	1	8
3	2	45
4	4	21

- **PRACTICE ASSIGNMENTS**

  i. Write a program to perform sparse matrix operations – addition and multiplications.