



COEP TECHNOLOGICAL UNIVERSITY (COEP Tech)

A Unitary Public University of Government of Maharashtra
(Formerly College of Engineering Pune (COEP))

DSA Lab Assignment 4

Problem Statement 4:

Implement a sparse matrix with operations

1. initialize a empty sparse matrix
2. insert an element in sparse matrix
3. Add two matrices and return the result as a matrix.
4. Transpose Sparse matrix.

(Hint: Use array of structure)

Lab File Writing:

Write Short Note on

1. Sparse Matrix and its representation
2. Algorithm for each operation
3. Time complexity of each operation with justification
4. Applications of Sparse matrix

Conclusion

Additional Program:

Create the following Term Document Matrix (Sparse Matrix)

Diagram illustrating a Term Document Matrix (Sparse Matrix) structure. The matrix is labeled "Term Document Matrix" and "Vocabulary". The rows represent "Documents" (D1, D2, D3, ..., DN) and the columns represent "Unique Word Ids" (0, 1, 2, 3, ..., V). Each cell shows the occurrence of a word in the document. An arrow points to the matrix with the label "Sparse Numpy Matrix". Another arrow points to the "Unique Word Ids" header with the label "Vocabulary". A third arrow points to the "Documents" header with the label "Document Vector". A fourth arrow points to a cell in the matrix with the label "Each cell show the occurrence of a word in the document".

	0	1	2	3	...	V
D1	1	0	1	0	...	1
D2	0	1	0	0	...	0
D3	1	0	1	0	...	1
...
DN	0	1	0	1	...	1

The Matrix has shape No of Documents X Vocabulary

- Represent documents as sparse matrices (represent documents as rows, terms as columns)
- Add them to get combined term frequency matrix.
- Transpose the term document matrix to get term-wise document view.



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Note:

- Check the above writeup in next turn.
- Ensure the code is well documented and modular.
- Upload code file(.c) and its output screenshot in Zip file on Moodle