Lab-III
National Institute of Technology Silchar
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Subject Code: CS-201 | Subject: Data Structures
Semester: 3rd | Department: CSE
Course: B.Tech | Section: A

You have to write the time complexities and space complexities in the lab copies for all questions.

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1. Given an array $A[]$. We can convert the single-dimensional array into a 2D array (matrix) without using a 2D array structure. Assume the representation is in row-major order. Write a program to add, subtract, and multiply two such matrices without using 2D array structures. Note: The resultant array must be in a single-dimensional array.

2. Write a program to rotate a matrix 90° clockwise.

3. Given a matrix, print all elements of the given matrix in a diagonal order.
   Example input:
   1 2 3
   4 5 6
   7 8 9
   Output:
   1
   4 2
   7 5 3
   8 6
   9

4. Program to check idempotent matrix. A matrix is considered idempotent if the matrix multiplied by itself returns the same matrix. The matrix M is considered idempotent if and only if $M \times M = M$.
   Example input:
   3 -6
   1 -2
   Output: Idempotent Matrix

   Another example input:
   2 -2 -4
   -1 3 4
   1 -2 -3
   Output: Idempotent Matrix.