INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM 695 547

First Year B. Tech. - Assignment Sheet
MA122-Computer Programming and Applications

31.03.2017   **Maximum Marks: 10**   **Assignment Sheet 12**

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a. Define a class *Matrix* to represent a $n \times m$ matrix $\mathbf{M}$. Include the following members:

1. Private members
    i. number of rows n
    ii. number of columns m
    iii. the matrix $\mathbf{M}$

2. Member functions
    i. a default constructor
    ii. a constructor to initialize the matrix size and elements
    iii. a function to change its private members
    iv. a function to add two matrices and set the result in a third matrix
    v. a function to multiply two matrices and set the result in a third matrix
    vi. a function to calculate the exponential of a matrix: $\exp(\mathbf{M}) = \sum_{n=0}^{\infty} \frac{\mathbf{M}^n}{n!}$.
        Assume that all the elements in the matrix $\mathbf{M}$ are between 0 and 0.1.
    vii. a function *show_matrix* to display the matrix
    viii. a destructor.

    Write a program to implement the above class. Ask the user to enter n, m and $\mathbf{M}$. Also ask the user to chose one of the operations. Call the function *show_matrix* to display the results from the *main* function.

Program submission: