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**Institute for Advancing Intelligence, TCG CREST**
(TCG Centres for Research and Education in Science and Technology)

# Introduction to Computer Programming and Data Structures
# Assignment 06

Maximum Marks: **100** Submission Deadline: **2023-June-02**
Topic: Matrix Algorithms

**Assignment problem # AP0601**

- **Problem**: Given file containing a square float matrix. find the inverse of it, if exists. Display the inverse matrix in the terminal.
- **Input**: A path to the input file (say "`input_matrix.txt`")
  - The first line contains a positive integer $n$, the order of the matrix.
  - It follows $n$ lines where in each line is the row of the matrix where the elements are separated by spaces.

[80]

**Assignment problem # AP0902**

- **Problem**: Given file containing a square float matrix, find the determinant of it, if exists. Use row reduction method to calculate the determinant.
- **Input**: A path to the input file (say "`input_matrix.txt`")
  - The first line contains a positive integer $n$, the order of the matrix
  - It follows $n$ lines where in each line is the row of the matrix where the elements are separated by spaces.
- **Output:** Determinant value in the terminal

[30]

**Assignment problem # AP0903**

- **Problem**: Given a square float matrix, find a dominant eigenvalue and corresponding dominant eigenvector, using power method [1].
- **Input**: A path to the input file (say "`input_matrix.txt`")
  - The first line contains a positive integer $n$, the order of the matrix
  - It follows $n$ lines where in each line is the row of the matrix where the elements are separated by spaces.
- **Output:** print a dominant eigenvalue and corresponding eigenvector in the terminal.

[40]

[1] see the course webpage for the related materials