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Inventing Harmonious Future

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

Introduction to Computer Programming and Data Structures

Assignment 09

Maximum Marks: **100** Submission Deadline: **2022-Nov-22**
Topic: Matrix Algorithms

Assignment problem # AP0901

- **Problem**: Given a square matrix find the inverse of it, if exists.
- **Input**:
  - 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.
  - Input file name "`input_AP0901.txt`".

[40]

Assignment problem # AP0902

- **Problem**: Given a square matrix find the determinant of it, if exists. Use row reduction method to calculate the determinant.
- **Input**:
  - 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.
  - Input file name "`input_AP0902.txt`".

[30]

Assignment problem # AP0903

- **Problem**: Given a square matrix, find a dominant eigenvalue and corresponding dominant eigenvector, using power method [1].
- **Input**:
  - 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.
  - Input file name "`input_AP0903.txt`".
- Bonus Problem: Find all the eigen values and the eigen vectors of the given matrix.

[30+30]

[1] see the course webpage for the related materials