

Matrices

Inverse of Matrix – Part 1

Inverse of a Matrix

- The operation of dividing one matrix by another does not exist in matrix theory, but equivalent of division of a unit matrix by any square matrix can be accomplished (in most cases) by a process known as inversion of matrix.
- In ordinary algebra, if $x \times y = 1$, then $x = 1/y$ or we may say that x is inverse of y or vice versa.

Inverse of a Matrix

- Similarly, if A is a matrix and its inverse A^{-1} , then their product must be equal to the identity matrix.
- $A \times A^{-1} = I$ (I is identity matrix).
- $A^{-1} = I/A$

Inverse of a Matrix

■ Uses of Inverse Matrix:

- i. Solving simultaneous equation.
- ii. Input Output analysis
- iii. Regression analysis

Inverse of a Matrix

❖ Conditions to calculate inverse of matrix:

- I. The matrix needs to be square matrix
- II. The matrix must non-singular matrix i.e., the determinant should not be zero.

☐ Method to Calculate Inverse of Matrix:

- A. Co-factor Method- Using adjoint matrices
- B. Gauss Elimination Method

Inverse of a Matrix

□ A. Co-factor Method:

➤ Formula: $A^{-1} = \frac{1}{|A|} \cdot AdjA$

- Where,
- $Adj.A$ is transpose of matrix of cofactors of the elements of matrix A .

To be Continued

Inverse of a Matrix

THANK YOU