Slides (Module 2) on Properties of Invertible Matrices

Properties of Invertible Matrices

Theorem: If A is an invertible matrix, A^{-1} is also invertible and

$$(A^{-1})^{-1} = A$$

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Theorem: If A is any invertible matrix and c is a non-zero scaler, then the matrix cA is also invertible and

$$(cA)^{-1} = \frac{1}{c}A^{-1}$$

Properties of Invertible Matrices

Theorem: If A, B are invertible matrices of same size, then AB is also invertible and

$$(AB)^{-1} = B^{-1}A^{-1}$$

The above theorem can be generalized for any number of matrices.

$$(A_1A_2 \dots \dots A_n)^{-1} = A_n^{-1} \dots \dots A_2^{-1}A_1^{-1}$$

Properties of Invertible Matrices

Theorem: If A is an invertible matrix, A^T is also invertible and

$$(A^T)^{-1} = (A^{-1})^T$$

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Theorem: If A is an invertible matrix, then A^n is also invertible for all non-negative integers n and

$$(A^n)^{-1} = (A^{-1})^n$$

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