Matrix Algebra

Sec 4.5 and 4.6 Theoretical Handout

Identity Matrix: An identity matric is a square matrix that has 1s along the principal diagonal and 0s everywhere else. The symbol for identity matrix is .

Properties of Identity Matrix:

* Identity matrix has a special property that .
* Inserting an identity matrix between two matrix will not change the product,
* Squaring an identity matric is equal to the identity matrix

Any matrix that remains unchanged when multiplied to itself is said to be idempotent.

Null Matrix: A null matrix is simply a matrix of 0s. A null matrix may be square or non-square.

Transpose

Consider a matrix A. If the columns and rows of matrix A are interchanged, so that its first row becomes its first column, or vice-versa, then we obtain the transpose of A. The transpose of A is given as or .

Properties of Transpose Matrix  
1. : This means the transpose of a transpose is the original function

2.

3.

Inverse Matrix

Consider matrix A. The inverse of A is .

Properties of Inverse matrix:

* Inverses can only exist for square matrices, but not all square matrices have inverses.
* If a square matrix has an inverse, it is called nonsingular
* If a matrix (square or non-square) does not have an inverse, it is called singular
* If the inverse of is , then the inverse of is
* If has the dimension then is also of the dimension
* The inverse of a nonsingular matrix is unique
* : inverse of an inverse is the original matrix