

Inverse and Transpose

The **inverse** of a matrix A is denoted A^{-1} . Multiplying by the inverse results in the identity matrix.

A non square matrix does not have an inverse matrix. We can compute inverses of matrices in octave with the $\text{pinv}(A)$ function and in Matlab with the $\text{inv}(A)$ function. Matrices that don't have an inverse are *singular* or *degenerate*.

The **transposition** of a matrix is like rotating the matrix 90° in clockwise direction and then reversing it. We can compute transposition of matrices in matlab with the transpose(A) function or A':

$$A = \begin{bmatrix} a & bc & de & f \end{bmatrix}$$

$$A^T = \begin{bmatrix} a & c & eb & d & f \end{bmatrix}$$

In other words:

$$A_{ij} = A_{ji}^T$$

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1  % Initialize matrix A
2  A = [1,2,0;0,5,6;7,0,9]
3
4  % Transpose A
5  A_trans = A'
6
7  % Take the inverse of A
8  A_inv = inv(A)
9
10 % What is  $A^{-1}A$ ?
11 A_invA = inv(A)*A
12
13

```

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