Matrices in MATLAB

matrix entries

A = [a b c ; d e f ; g h i ; j k l] (A becomes 4 by 3 matrix)

size(A)

A(i,j) (where i,j are indices: gives scalar)

j : k (gives index (row) vector with consecutive entries)

A(I,J) (where I, J are index vectors: gives submatrix)

[A B C] (concatenates horizontally)

[A ; B ; C] (concatenates vertically)

diag(x) (takes vector x to diagonal matrix)

diag(A) (takes matrix A to column vector formed from diagonal)

vector space operations

A + B

A − B

s * A

zeros(m,n)

matrix multiplication

A * B

A ˆ n

inv(A)

eye(n)

det(A)

trace(A)

reduced row echelon form and null space

rank(A)

R = rref(A) (R becomes reduced row echelon form of A)

U = rref([A eye(m)])

J = n+1 : n+m

E = U(: , J) (E becomes matrix with E A = R)

N = null(A, 'r') (N becomes rational basis for null space, AN = 0)

eigenvalues and eigenvectors

[P,D] = eig(A) (P and D become matrices with AP = PD, where D is diagonal)

transpose

A'