Functions

> ⚠️ **Note**
>
> - **x** and **y** represent real values or variables.
>
> - **c** and **d** represent complex values or variables.
>
> - **m** and **n** represent integer values or variables.
>
> - **U** represents a matrix of values.
>
> - A matrix can be passed to a function that operates Element-wise on matrices, as its argument in the example as follows
>
>   X = [1, -2, 3; -4, 5, -6; 7, -8, 9];
>
>   Y = abs(X)
>   result:
>   Y = [1 2 3; 4 5 6; 7 8 9]

Function name	Syntax	Function
abs	abs(x) abs(c)	To return an absolute value of x or a complex modulus of c. This function operates Element-wise on matrices.
acos	acos(x) acos(c)	To return an arc cosine of an angle in the range of 0.0 through pi. All angles are measured in radians.This function operates Element-wise on matrices.
acosd	acosd(x) acosd(c)	To return an inverse cosine of a given value expressed in degrees. This function operates Element-wise on matrices.
acosh	acosh(x) acosh(c)	To return an inverse hyperbolic cosine of a given value. This function operates Element-wise on matrices.
acot	acot(x) acot(c)	To return an inverse cotangent of a given value. This function operates Element-wise on matrices.
acotd	acotd(x) acotd(c)	To return an inverse cotangent of a given value expressed in degrees. This function operates Element-wise on matrices.
acoth	acoth(x) acoth(c)	To return an inverse hyperbolic cotangent of a given value. This function operates Element-wise on matrices.
acsc	acsc(x) acsc(c)	To return an inverse cosecant of a given value. This function operates Element-wise on matrices.
acscd	acscd(x) acscd(c)	To return an inverse cosecant of a given value expressed in degrees. This function operates Element-wise on matrices.
acsch	acsch(x) acsch(c)	To return an inverse hyperbolic cosecant of a given value. This function operates Element-wise on matrices.
asec	asec(x) asec(c)	To return an inverse secant of a given value. This function operates Element-wise on matrices.
asecd	asecd(x) asecd(c)	To return an inverse secant of a given value expressed in degrees.This function operates Element-wise on matrices.
asech	asech(x) asech(c)	To return an inverse hyperbolic secant of a given value. This function operates Element-wise on matrices.

asin	asin(x)	To return an arc sine of an angle in the range of -pi/2 through pi/2. This function operates Element-wise on matrices.
	asin(c)	
asind	asind(x)	To return an inverse sine of a given value expressed in degrees. This function operates Element-wise on matrices.
	asind(c)	
asinh	asinh(x)	To return an inverse hyperbolic sine of a given value. This function operates Element-wise on matrices.
	asinh(c)	
atan	atan(x)	To return an arc tangent of an angle in the range of -pi/2 through pi/2. This function operates Element-wise on matrices.
	atan(c)	
atan2	atan2(x, y)	To return an arc tangent of an angle in the range of -pi through pi. atan2(U, V) returns a matrix of the same size as the U and V matrices containing the Element-by-Element, inverse tangent of the real parts of U and V.
	atan2(U, V)	
atand	atand(x)	To return an inverse tangent of a given value, expressed in degrees. This function operates Element-wise on matrices.
	atand(c)	
atanh	atanh(x)	To return an inverse hyperbolic tangent of a given value. This function operates Element-wise on matrices.
	atanh(c)	
ceil	ceil(x)	To return a smallest (closest to negative infinity) value that is not less than the value of x and is equal to a mathematical integer. This function operates Element-wise on matrices.
col	col(U, m)	To return a specific column values of a given matrix. U is a square matrix, m is a column index (starts at 0).
conj	conj(c)	To return a conjugated value of c. This function operates Element-wise on matrices.
cos	cos(x)	To return a trigonometric cosine of an angle. This function operates Element-wise on matrices.
	cos(c)	
cosd	cosd(x)	To return a cosine of a given value expressed in degrees. This function operates Element-wise on matrices.
	cosd(c)	
cosh	cosh(x)	To return a hyperbolic cosine of a given value. This function operates Element-wise on matrices.
	cosh(c)	
cot	cot(x)	To return a cotangent of a given value. This function operates Element-wise on matrices.
	cot(c)	
cotd	cotd(x)	To return a cotangent of a given value expressed in degrees. This function operates Element-wise on matrices.
	cotd(c)	
coth	coth(x)	To return a hyperbolic cotangent of a given value. This function operates Element-wise on matrices.
	coth(c)	
count	count(U)	To return a number of Elements of a given matrix.
csc	csc(x)	To return a cosecant of a given value. This function operates Element-wise on matrices.
	csc(c)	
cscd	cscd(x)	To return a cosecant of a given value expressed in degree. This function operates Element-wise on matrices.
	cscd(c)	
csch	csch(x)	To return a hyperbolic cosecant of a given value. This function operates Element-wise on matrices.
	csch(c)	
det	det(U)	To return a determinant of a given matrix. U is a square matrix.

diag	diag(U)	To return a diagonal matrix and diagonals of the matrix. If U is a row matrix or a column matrix of n Elements, this function will return a square matrix of order n+abs(m), with the Elements of U on the kth
	diag(U, m)	diagonal. k = 0 represents the main diagonal. k > 0 is above the main diagonal. k < 0 is below the main diagonal. If U is a square matrix, this function will return a column matrix formed by the Elements of the kth diagonal of U.
exp	exp(x)	To return a Euler's number e raised to the power of a or c. This function operates Element-wise on matrices.
	exp(c)	
eye	eye(m)	To return an identity matrix of dimension m x m.
factorial	factorial (m)	To return a factorial of m value.
floor	floor(x)	To return a largest (closest to positive infinity) value that is not greater than the value of x and is equal to a mathematical integer. This function
	floor(c)	operates Element-wise on matrices.
IEEEremainder	IEEEremainder(x, y)	To compute the remainder operation in two arguments as prescribed by the IEEE 754 standard.
if	if(b,x,y)	To return the value of x if b is true. Otherwise, y is returned. Where b is a boolean value.
imag	imag(c)	To return a real value of an imaginary part of a given complex number. This function operates Element-wise on matrices.
invert	invert(U)	To return an inverse or pseudo inverse of a given matrix. If the given matrix is a square matrix, the inverse of a U matrix will be returned using the LU factorization. If the given matrix is not a square matrix, a pseudo inverse matrix will be returned using the QR factorization.
linsolve	linsolve (U,V)	X = linsolve(U,V) solves the linear system U*X = V using the LU factorization with partial pivoting when U is a square matrix.
ln	ln(x)	To return a natural logarithm (base e) of a given value. This function operates Element-wise on matrices.
	ln(c)	
log	log(x)	To return a natural logarithm (base e) of a given value. This function operates Element-wise on matrices.
	log(c)	
log10	log10(x)	To return a logarithm base 10 of a given value. This function operates Element-wise on matrices.
	log10(c)	
log2	log2(x)	To return a logarithm base 2 of a given value. This function operates Element-wise on matrices.
	log2(c)	
max	max(x, y,...)	To return a greater of the given values. max(U) returns the largest Element of a given matrix. max(U, V) returns a matrix the same size as U and V with the largest Elements taken from U or V. The dimensions of U and V must be the same.
	max(c, d,...)	
	max(U)	
	max(U,V)	
mean	mean(U)	To return a mean or average value of a given matrix. U is a row or a column matrix: mean(U) returns the mean value of all Elements in the given matrix.U is a 2-D matrix: mean(U) returns a row matrix that contains the mean value of each column of the given matrix.
median	median (U)	To return a median value of a given matrix. U is a row or column matrix: median(U) returns the median value of all Elements in the given matrix. U is a 2-D matrix: median(U) returns a row matrix that contains the median value of each column of the given matrix.
min	min(x, y,...)	To return a smaller of the given values. min(U) returns the smallest Element of a given matrix. min(U, V) returns a matrix the same size as U and V with the smallest Elements taken from U or V. The dimensions of U and V must be the same.
	min(c, d,...)	
	min(U)	
	min(U,V)	

num2str	num2str (x) num2str (c)	To return a string specifying a given number x.
ones	ones(m, n)	To return an m x n matrix of all 1s.
pow	pow(x, y) pow(U, c) pow(c, d)	To return a value of the first argument raised to the power of the second argument. This function operates Element-wise on a given matrix U.
random	random()	To return a real value with a positive sign, greater than or equal to 0.0 but less than 1.0.
real	real(c)	To return a real value of the real part of a given complex number. This function operates Element-wise on matrices.
rint	rint(x)	To return a value that is closest in value to an argument and is equal to a mathematical integer. This function operates Element-wise on matrices.
round	round(x)	To return a closest value to an argument and is equal to a mathematical integer. This function operates Element-wise on matrices.
row	row(U, m)	To return a specific row values of a given matrix. U is a square matrix, m is a row index (starts at 0).
sec	sec(x) sec(c)	To return a secant of a given value.This function operates Element-wise on matrices.
secd	secd(x) secd(c)	To return a secant of a given value expressed in degree. This function operates Element-wise on matrices.
sech	sech(x) sech(c)	To return a hyperbolic secant of a given value. This function operates Element-wise on matrices.
sin	sin(x) sin(c)	To return a trigonometric sine of an angle. This function operates Element-wise on matrices.
sind	sind(x) sind(c)	To return a sine of a given value, expressed in degree This function operates Element-wise on matrices.
sinh	sinh(x) sinh(c)	To return a hyperbolic sine of a given value. This function operates Element-wise on matrices.
size	size(U) size(U, m)	To return a size of a given matrix. If only the matrix is passed to the function as an argument, the returned value is a 1x2 matrix. The first Element is the number of rows and the second Element is the number of columns.If the second parameter (m) is specified, this function will return the size of an mth dimension of a given matrix as a scalar value. The second argument can be 1 or 2 (1 for the row size and 2 for the column size). For example: U = [1, 2, 3; 4, 5, 6]; size(U) is [2, 3] size(U, 1) is 2 size(U, 2) is 3
sort	sort(U) sort(U, 'descend')	To sort the Elements of a given matrix in an ascending or descending order. If the second argument is specified with 'ascend' or 'descend', the Elements will be in an ascending or descending order respectively. If this function is called without a second argument, the Elements will be sorted in an ascending order. U is a row or column matrix: sort(U) and sort(U, ascend) sort all Elements in the given matrix. U is a 2-D matrix: sort(U) and sort(U, ascend) sort Elements in each column of the given matrix.
ssqrt	sqrt(x) sqrt(c)	To return a correctly rounded positive square root of a double value.This function operates Element-wise on matrices.
std	std(U) std(U, flag)	To return a standard deviation of a given matrix. The 'flag' argument can be 0 or 1. It specifies the method for calculating the standard deviation. If the flag = 0, the standard deviation is normalized by N-1. If the flag = 1, the standard deviation is normalized by N where N is the number of data. The value of the flag will be zero by default. U is a row or column matrix: std(U) and std(U, flag) returns the standard deviation of all Elements in the given matrix. U is 2-D matrix: std(U) and std(U, flag) returns a row matrix that contains the standard deviation of each column of the given matrix.
str2num	str2num (s)	To return a number specified by a given string s.
sum	sum(U)	To return a summation of all Elements in a U matrix.

tan	tan(x) tan(c)	To return a trigonometric tangent of an angle. This function operates Element-wise on matrices.
tand	tand(x) tand(c)	To return a tangent of a given value expressed in degree.This function operates Element-wise on matrices.
tanh	tanh(x) tanh(c)	To return a hyperbolic tangent of a given value. This function operates Element-wise on matrices.
toDegrees	toDegree s(x) toDegree s(c)	To convert an angle measured in radians to an approximately equivalent angle measured in degrees.This function operates Element-wise on matrices.
toRadians		To convert an angle measured in degrees to an approximately equivalent angle measured in radians. This function operates Element-wise on matrices.
transpose	transpos e(U)	To return a transposition of a given matrix
zeros	zeros(m, n)	To return an m x n matrix of all 0s.