**peak2rms**

Ratio of the peak value to the root mean square value.

The function calculates the ratio of the peak magnitude of given signal or vector to its root mean square value.

**Calling Sequence**

out=peak2rms(in)

out=peak2rms(in, orientation)

**Arguments**

**Input:**

* in

Vector or Matrix of real or complex elements.

* orientation

This input argument specifies the direction along which the peak to rms value is to be calculated.

1. a string with possible values "r", "c" or "m"
2. m gives the first non singleton orientation of input, which is also the default orientation when not specified.

**Output:**

* out

The argument which stores the peak to RMS ratio.

a scalar with real value when input is a vector.

when input is a matrix, out is the peak magnitude to RMS value along the orientation specified or the default one when not specified.

**NOTE: THE ORIENTATION CONSIDERED WHEN NOT SPECIFIED IS, THE INDEX OF FIRST DIMENSION OF INPUT "IN",GREATER THAN 1.**

**Description**

* For vector as input, the output is the ratio of peak value to the RMS value. The RMS value can be calculated by taking the square root of mean value of the squared sum of the elements.
* When a matrix is given as input the output is peak to RMS ratio in the orientation specified.

The orientation can be given as string with values "r","c" or "m".

1. peak2rms(in, 'r') calculates the values of ratio of peak to RMS of columns of matrix. The output in this case is a row vector with peak2rms value of each column of in.

2. peak2rms(in, 'c') calculates the values of ratio of peak to RMS of rows of matrix, where the output would be a column vector having peak2rms value of each row of in.

3. The default orientation is chosen to be the index of first dimension of input greater than 1.

Hence peak2rms(in) is equivalent to peak2rms(in, "m").

* For an N dimensional array the orientation is the index of first non singleton dimension of the array.

If the elements of matrix are complex the absolute values are considered in the calculation of RMS value.

**Examples:**

**1)To calculate peak2rms of a matrix:**

IN=[1 5 7; 6 8 10]

OUT=peak2rms(IN)

The output should be 1.3949717 1.1992507 1.1585689

**2)To calculate peak2rms value of a sinusoid:**

t=0:0.6:9

IN=cos(6\*%pi\*t);

OUT= peak2rms(IN)

The output should be

OUT= 1.3719887

3**)To calculate peak2rms of a 2 Dimensional matrix:**

t=0:0.6:4.5

IN=[cos(2\*%pi\*24\*t) ; cos(2\*%pi\*13\*t)]

OUT=peak2rms(IN,'r') (Calculates peak to RMS along each column)

The output should be

OUT= 1. 1.3211192 1.3211192 1.3211192 1.3211192 1. 1.3211192 1.3211192

OUT=peak2rms(IN,'c') (Calculates peak to RMS along each row)

The output should be

OUT= 1.3719887

1.3719887

**4)To calculate peak2rms of rows of complex matrix:**

IN=[5+%i\*3 2+%i\*4; 3+%i\*6 1+%i\*2]

OUT=peak2rms(IN,'r')

The output should be OUT= 1.1221672

1.3416408

**References:**

1)MATLAB help document**.**