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**count**

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syntax: `count(vector)`

purpose: This program simply counts the number of elements in `vector` whose value equals a particular number or falls into a specified range. To be more precise, `count` returns the number of elements whose value is non-zero, but this can be used with other programs to a great variety of purposes.

examples: `>> x = [1 2 3 4 5 6 7 20];`  
`>> count(x>5) => ans: 3`  
`>> count(x>=5) => ans: 4`  
`>> y = [1.1 2.1 3.1 4.0 4.9 5.8 6.7 19];`

To count how many elements of `x` are less than or equal to the corresponding elements of `y`:

`>> count( x <= y ) => ans: 4`

You have just lost \$5 to a street gambler in a coin flip game. He tossed 5 heads in a row; the bet was that he wins \$1 for each head while you win \$1 for each tail. While walking home you realize that his coin was probably not fair. Putting aside for the moment the considerable circumstantial evidence that the gambler was a cheat, do you have any statistical justification for thinking that the coin was not fair?

```

nullhypoth = [0 1]; % equal probs of heads or tails
Ntrials = 1000;
z = starttally;
for trial=1:Ntrials
    flips = sample(5, nullhypoth);
    a = count(flips==0); % count the number of heads
    tally a z;
end
count(z>=5)/Ntrials; % p-value for 5 heads in 5 flips

```

The answer was 0.0310, quite close to the widely known exact value of  $\frac{1}{32}$  for the probability of getting 5 heads in 5 coin tosses.

see also: `length(x)` tells how many elements there are in a vector.

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`size(x)` tells the number of rows and columns in a vector or matrix  
`sum(x)` gives the sum of the values in a vector.

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