Writing your own factorial function

$$n! = n * (n - 1) * (n - 2) * \ldots * 2 * 1$$
$$1! = 1$$
$$2! = 2 * 1 = 2$$
$$5! = 5 * 4 * 3 * 2 * 1 = 2$$

```
>>> from math import factorial
>>> factorial(5)
>>> 120
```

As shown above, we can use the factorial function from the math module. Here, you'll write your own factorial function. First, we start with a simple function that returns the product of its two inputs:

```
def mult(x, y):

    """Returns the product of x and y"""

    return x * y
```

Nothing too surprising here. Now, take a look at this:

```
>>> reduce(mult, [2, 3])

6

>>> reduce(mult, [2, 3, 4])

24

>>> reduce(mult, [1, 2, 3, 4])

24
```

Notice that `reduce` takes two inputs: A function and a list and it applies that function to "compress" the list into a single value. In this case, it multiplied all of the values together.

Now, write a function `factorial(n)` that takes a positive integer `n` and returns `n!`.

This is "mean"...

Finally, write a function called `mean(L)` that takes a list as input and returns the mean (average) value in that list. Using `reduce` will be handy here. You may also want to define an `add` function that

returns the sum of two numbers. You'll need to know the number of elements in the list. This can be found using the built-in function `len`. For example:

```
>>> len([1, 3, 5])

3

>>> len(range(1,10))

9
```

Here is the `mean` function in action:

```
>>> mean([1, 2, 3])

2

>>> mean([1, 1, 1])

1
```