Exercise: power recur

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5.0 points possible (graded)

ESTIMATED TIME TO COMPLETE: 7 minutes

In Problem 1, we computed an exponential by iteratively executing successive multiplications. We can use the same idea, but in a recursive function.

Write a function `recurPower(base, exp)` which computes base^{exp} by recursively calling itself to solve a smaller version of the same problem, and then multiplying the result by `base` to solve the initial problem.

This function should take in two values - `base` can be a float or an integer; `exp` will be an integer ≥ 0. It should return one numerical value. Your code must be recursive - use of the `**` operator or looping constructs is not allowed.

```
def recurPower(base, exp):
    '''
    base: int or float.
    exp: int >= 0

    returns: int or float, base^exp
    '''
    # Your code here
```

Press ESC then TAB or click outside of the code editor to exit

Unanswered

Note: In programming there are many ways to solve a problem. For your code to check correctly here, though, you must write your recursive function such that you make a recursive call directly to the function `recurPower`. Thank you for understanding.

Hints

What should your base case be?

To figure out what **base case** to use, think about what the smallest value of `exp` can be.

Smallest value of exp?

Recall that `exp` will be an integer greater than or equal to zero - so, the smallest value of `exp` is zero. What is the value of base^{exp} when `exp` equals zero, for any value of `base`?

Thinking about recursion

A good way to think about recursion is that recursion is the process of solving a given problem with a smaller instance of the same problem.

So, how could we express base^{exp} as a smaller instance of an exponential equation?

How to break down the equation

$$\text{base}^{\text{exp}} = \text{base} \cdot \text{base}^{\text{exp}-1}$$

To convince yourself this is true, put in real numbers for `base` and `exp`; then, work through the recursion over and over until you reach your base case.

If you are getting the error stating that "Your code should be recursive" when you already make a call to `recurPower`: check your indention -- specifically, a common mistake is that your function and docstring do not start at the same indentation level.