

Curso > Week 2... > 4. Func... > Exercis...

Audit Access Expires 5 de ago de 2020

You lose all access to this course, including your progress, on 5 de ago de 2020.

Exercise: power recur

Finger Exercises due Aug 5, 2020 20:30 -03 Completo

Exercise: power recur

5.0/5.0 points (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.

```
1 def recurPower(base, exp):
 2
 3
      base: int or float.
 4
      exp: int >= 0
 5
 6
      returns: int or float, base^exp
7
8
      # Your code here
9
      if exp == 1:
10
          return base
11
      elif exp == 0:
12
          return 1
13
      else:
14
          return base * recurPower(base, exp-1)
```

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

Correta

```
def recurPower(base, exp):
    base: int or float.
    exp: int >= 0
    returns: int or float, base^exp
    \# Base case is when exp = 0
    if exp <= 0:
        return 1
    # Otherwise, exp must be > 0, so return
    # base* base^(exp-1). This is the recursive case.
    return base * recurPower(base, exp - 1)
```

Test results

See full output CORRECT See full output

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

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

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.

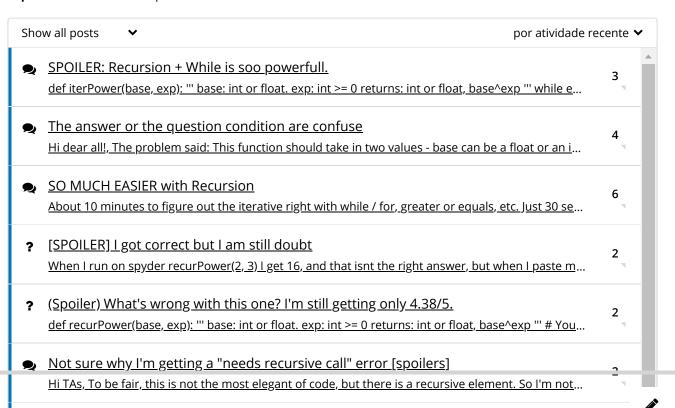
Enviar

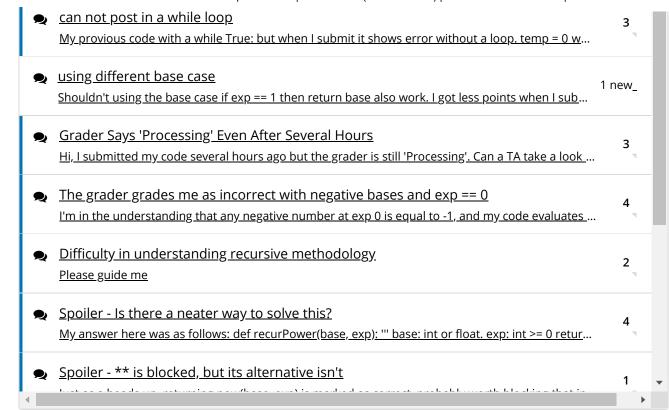
Answers are displayed within the problem

Exercise: power recur

Ocultar discussão

Topic: Lecture 4 / Exercise: power recur





© All Rights Reserved