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Exercise: gcd recur

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

Exercise: gcd recur

5.0/5.0 points (graded)
ESTIMATED TIME TO COMPLETE: 6 minutes

The greatest common divisor of two positive integers is the largest integer that divides each of them without remainder. For example,

- gcd(2, 12) = 2
- gcd(6, 12) = 6
- gcd(9, 12) = 3
- gcd(17, 12) = 1

A clever mathematical trick (due to Euclid) makes it easy to find greatest common divisors. Suppose that `a` and `b` are two positive integers:

- If b = 0, then the answer is a
- Otherwise, gcd(a, b) is the same as gcd(b, a % b)

See this website for an example of Euclid's algorithm being used to find the gcd.

Write a function `gcdRecur(a, b)` that implements this idea recursively. This function takes in two positive integers and returns one integer.

```
1 def gcdRecur(a, b):
```

```
    '''
    a, b: positive integers

    returns: a positive integer, the greatest common divisor of a & b.
    '''
    # Your code here
    if b == 0:
        return a
    elif a == 0:
        return b
    else:
        return gcdRecur(b, a%b)
```

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

Correta

```
def gcdRecur(a, b):
    '''
    a, b: positive integers

    returns: a positive integer, the greatest common divisor of a & b.
    '''
    # Base case is when b = 0
    if b == 0:
        return a

    # Recursive case
    return gcdRecur(b, a % b)
```

Test results

Hide output

CORRECT

Test: gcdRecur(17, 204)

Output:

```
17
```

Test: gcdRecur(15, 345)

Output:

15

Test: gcdRecur(60, 9)

Output:

3

Test: gcdRecur(168, 182)

Output:

14

Test: gcdRecur(153, 153)

Output:

153

Test: gcdRecur(400, 352)

Output:

16

Test: gcdRecur(175, 14)

Output:

7

Test: gcdRecur(270, 255)

Output:

15

Test: gcdRecur(18, 22)

Output:

2

Test: gcdRecur(112, 176)

Output:

16

Hide 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 `gcdRecur`. Thank you for understanding.

If you are getting the error stating that "Your code should be recursive" when you already make a call to `gcdRecur` : 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

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Ocultar discussão

Topic: Lecture 4 / Exercise: gcd recur

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? How does python know at each time which of the two a or b is smaller to do the calculation? 7
Hello everybody, I solved it but finding first which one is the smallest to assign b and a%b in follo...

I feel like the hint is way too obvious 3
It basically told me how to do it and all I had to do was convert it into python syntax. It took like 1...

? I don't understand why I am not getting the right output. (Warning: code below) 5
I have done this question in two different ways, both as suggested above and also using a step by...

Video to help expain the principle 6
Hi all, I really struggle with recursion, and found a video particularly helpful for the Euclidian prob...

Hints in the question too obvious? 9 new
I feel like the hints given in the question already provide 90% of the solution. Maybe that's why so...

Mind Blowing Realization 5
I initially only understood why the code work when a was greater than b. The reason it works whe...

Finding GCD by Euclid's algorithm using iteration 2
In last exercise, we used iteration to find GCD by the conventional method of dividing and checki...

? Understanding the implication of my answer 4
I was able to write this program in the previous exercise when it said this program was recursive. ...

I am the smartest man alive!!!! 1 new
Obviously, far from it, but solving this one made me feel like the smartest man who's ever lived fo...

? I got the answer but don't know how 1 new
well after so many trial and error I got the correct answer for the problem but still scratching my ...

Check out the Euclidean algorithm wikipedia page and explore a bit. 1
There's some pretty interesting sets of alternative pseudocode solutions on the [Euclidean algorit...

Still unclear how I got my answer... 2 new
Well I got it right, but I kind of stumbled upon it, lucky me. I put it in python tutor and the steps m...

? It's now been a few days since I've submitted my answer, the grader process is still