day44 fibonacci

This is the second program we're doing today.

We're going to make a program that prints out the Fibonacci numbers. In case you haven't heard of them, the first 11 numbers in the Fibonacci sequence are here:

> 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89...

The first two numbers are 1 and 1. From then on, to find the next item in the list, add the previous two items. See up above how 1+1 = 2, so 2 is the third number, then 2 + 3 = 5, so 5 is the next number, etc?

This sequence of numbers shows up in nature in living things, and can be used to find the value of phi, the Golden Ratio (1.618…), which also shows up in nature, human creations, and which is considered by many to be key to what humans visually consider beautiful.

Your task today:

- Write a program named "day44 fibonacci" which asks the user for a number and then calculates that many terms of the Fibonacci sequence.
- Use a list to help you. Start with a list that contains two copies of the number 1: fib = [1,1].
- Ask the user how many terms they would like to generate. If they enter less than 3, do 3.
- Use a for loop to repeatedly add the previous two items in the list to get the next value, which you add to the list using .append(). If your list was called "fib" you could add the previous two values like this: `newValue=fib[x]+fib[x-1]` . After creating the new value, append it, then start the loop over again. Do not print out anything while you are creating the values.
- When all of the values are created, print them out using a for loop, one number per line. (Do not print out the whole list with brackets and commas, etc., use a for loop.)
- Use the number 16 to test your program. Make sure the last number printed is 987. See sample output on next page.
- There is an optional extra credit part on the next page too.

Sample output:

```
How many terms of the Fibonacci sequence
would you like me to calculate? 2

Sorry, the smallest number you can enter
is 3, so I'll print 3:

1
1
2

How many terms of the Fibonacci sequence
would you like me to calculate? 16

1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
```

Extra credit (optional): Format your output nicely using the .rjust string method (.rjust) and calculate phi as you go along as shown in my example. (Phi is approximated by dividing any term of the sequence by the previous term; the farther out you get in the sequence the closer this quotient gets to phi.) To use .rjust with a number you have to first turn it into a string using str(theNumber).rjust(6).

```
How many terms of the Fibonacci sequence
would you like me to calculate? 16

  Series Phi
       1 1
       1 1
       2 2.0
       3 1.5
       5 1.6666666666666667
       8 1.6
      13 1.625
      21 1.6153846153846154
      34 1.619047619047619
      55 1.6176470588235294
      89 1.6181818181818182
     144 1.6179775280898876
     233 1.6180555555555556
     377 1.6180257510729614
     610 1.6180371352785146
     987 1.618032786885246
```

If you do the extra credit please let me know. (Leave a private comment in the Google Classroom or send me an email. Thanks.)