Solution Review : Compute nth Fibonacci Number

This lesson will explain how to compute the nth Fibonacci number using recursion.

WE'LL COVER THE FOLLOWING

Solution: Use Recursion

The Fibonacci sequence is obtained by adding the previous two consecutive terms; they are defined by the sequence,

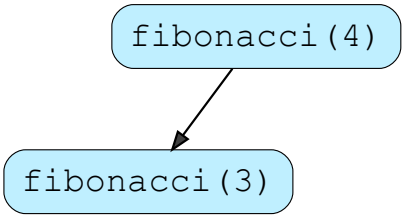
```
fibonacci(0) = 0 # base case
fibonacci(1) = 1

fibonacci(n) = fibonacci(n - 1) + fibonacci(n - 2) for n >= 2 # recursiv
e case
```

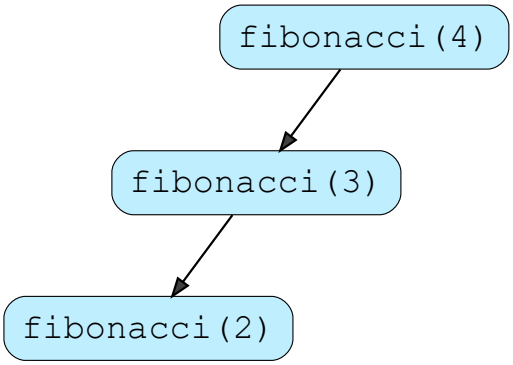
For example ,

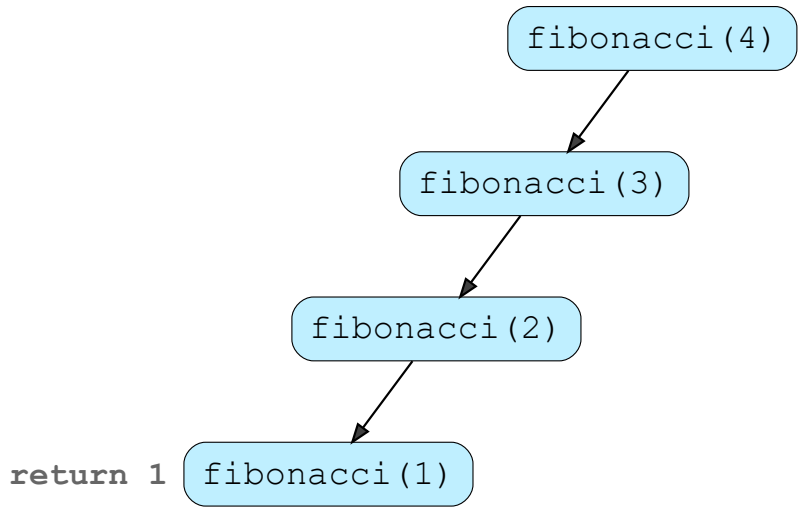
```
0,1,1,2,3,5,8,......

if n=2, f(n)=3
```

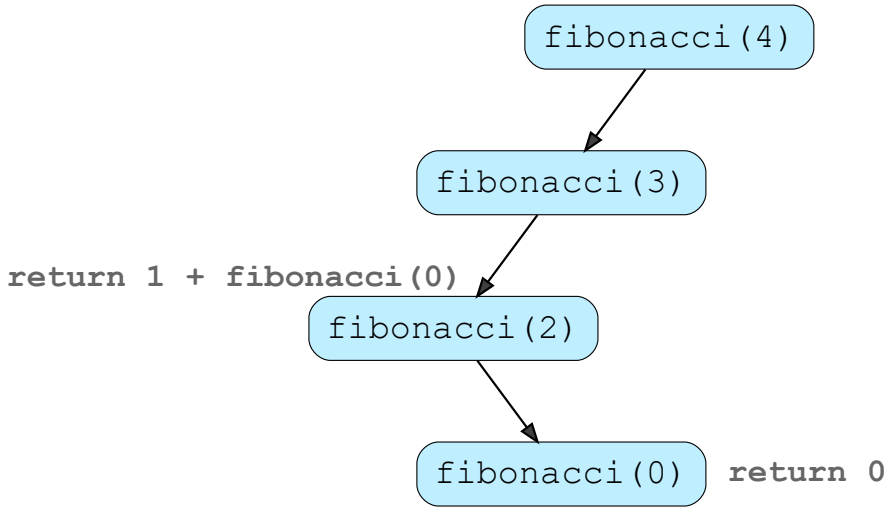
The following illustration explains the concept by calculating the **fourth** Fibonacci number.

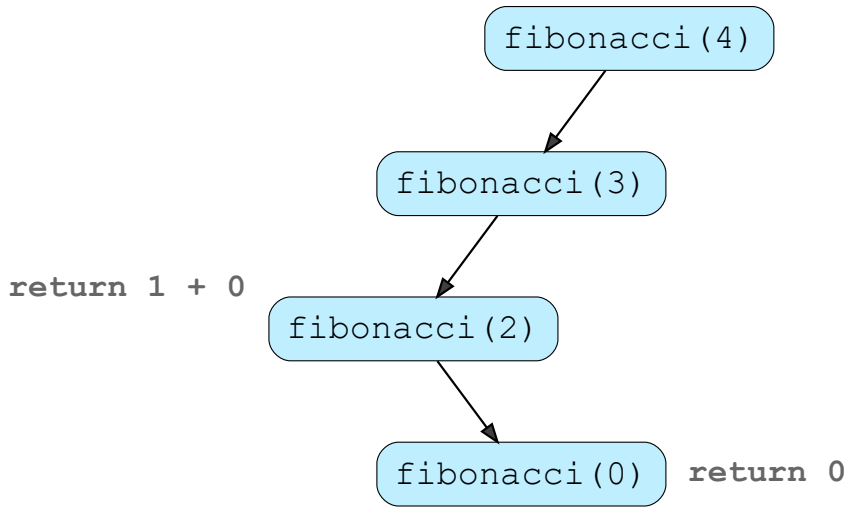
Recursion tree of fibonacci(4)

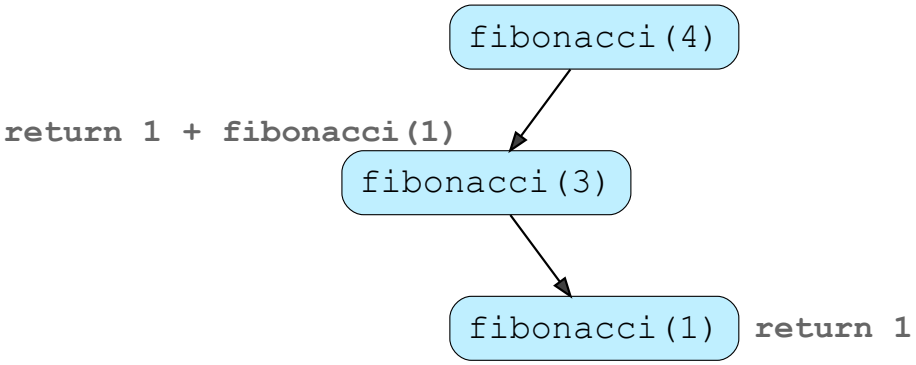


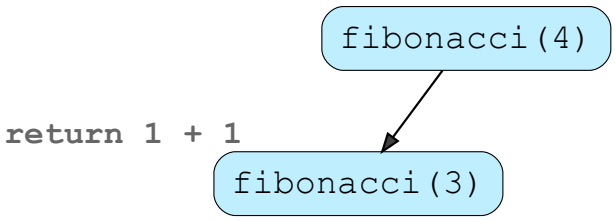

fibonacci(4)
fibonacci(3)
fibonacci(2)


fibonacci(4)
fibonacci(3)
fibonacci(2)
return 1
fibonacci(1)

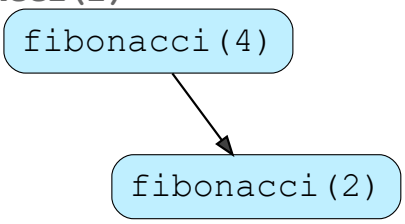

fibonacci(4)
fibonacci(3)
return 1 + fibonacci(0)
fibonacci(2)
fibonacci(0)
return 0


fibonacci(4)
fibonacci(3)
return 1 + 0
fibonacci(2)
fibonacci(0)
return 0

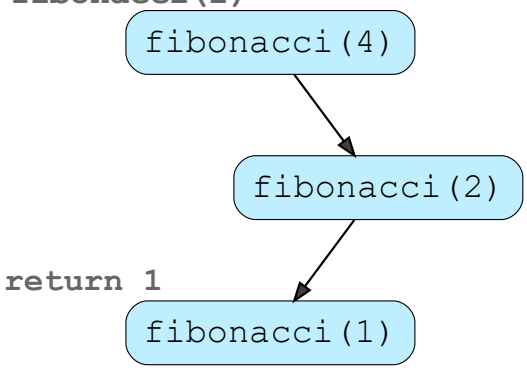

fibonacci(4)
return 1 + fibonacci(1)
fibonacci(3)
fibonacci(1)
return 1

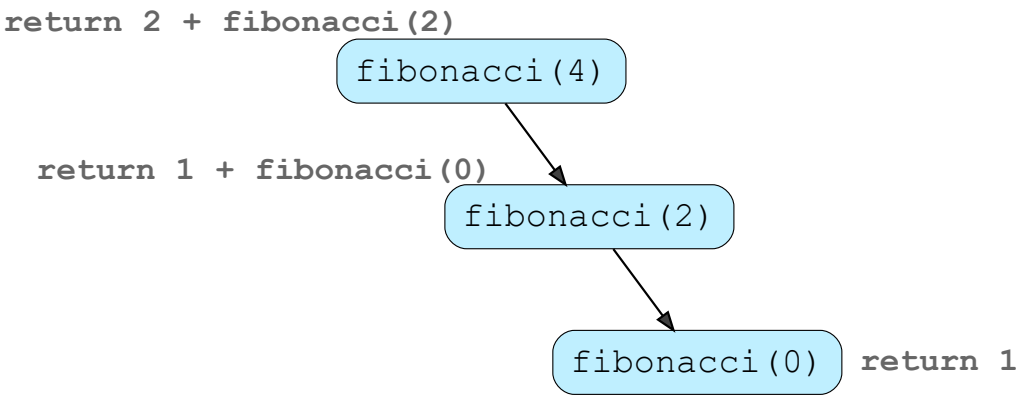

fibonacci(4)
return 1 + 1
fibonacci(3)

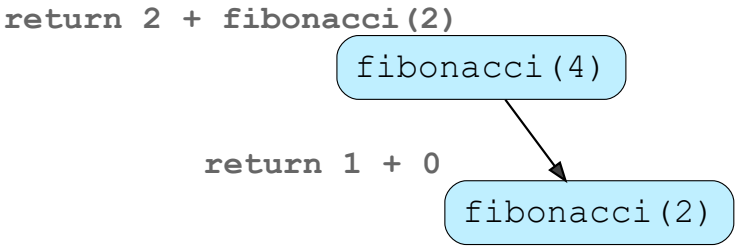
```
return 2 + fibonacci(2)
```

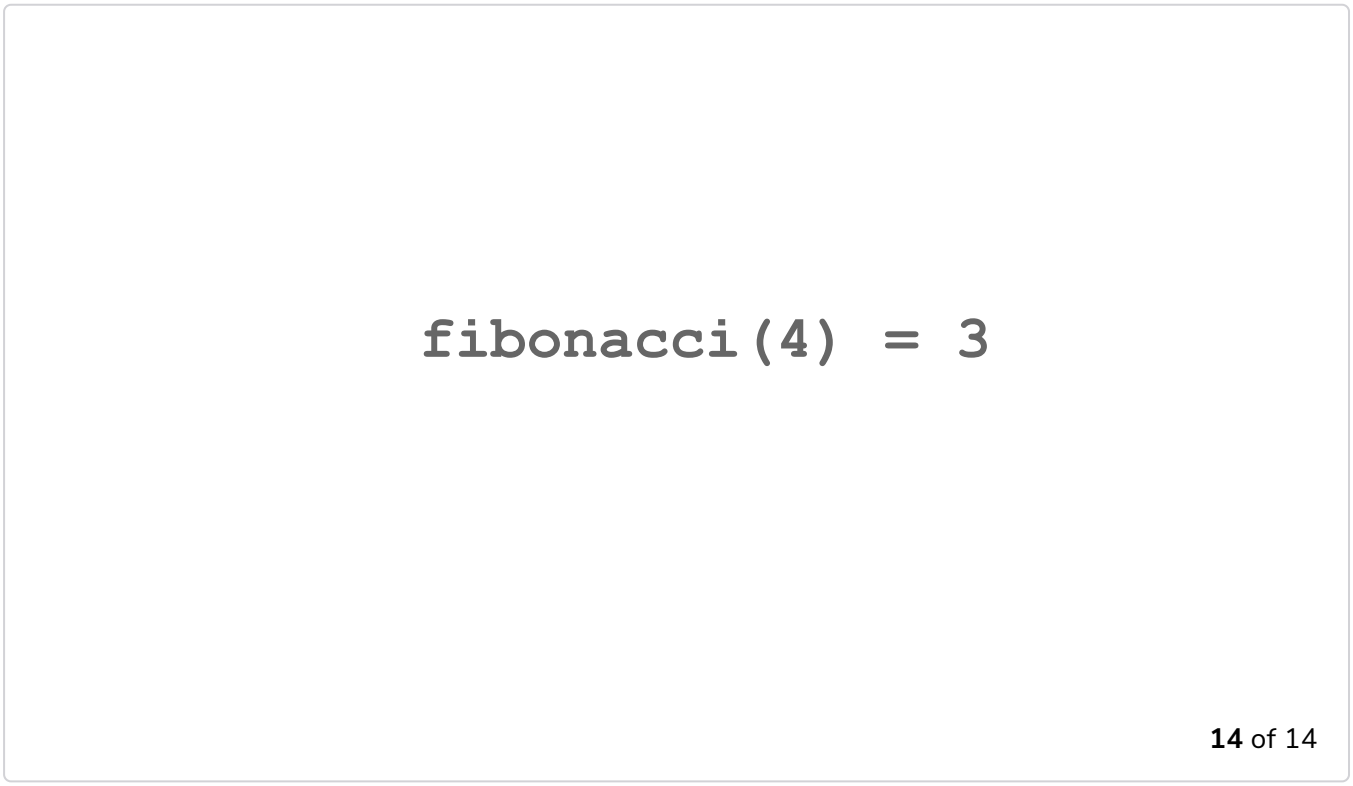



```
return 2 + fibonacci(2)
```




return 2 + fibonacci(2)
fibonacci(4)
return 1 + fibonacci(0)
fibonacci(2)
fibonacci(0)
return 1

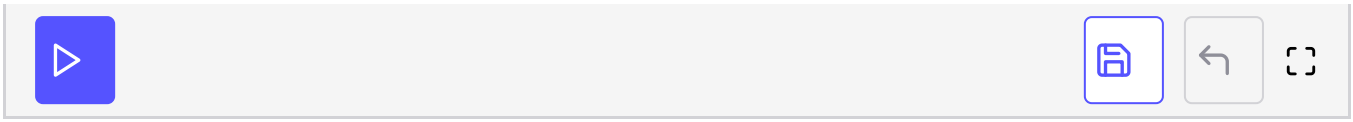

return 2 + fibonacci(2)
fibonacci(4)
return 1 + 0
fibonacci(2)



The following python code demonstrates how to find the nth fibonacci number:

```
def fibonacci(n):
  if n <= 1:
       return n
  else:
       return(fibonacci(n-1) + fibonacci(n-2))
```

```
print(fibonacci(4))
```



Let’s move on to the next problem.