Solution Review: Compute Sum of First n Natural Numbers

This lesson will explain how to compute the sum of the first n numbers using recursion.

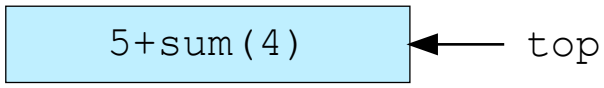
WE'LL COVER THE FOLLOWING

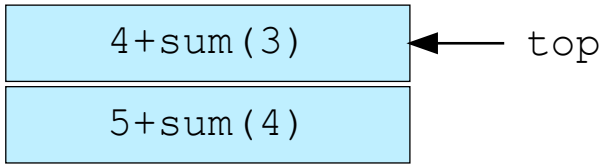
Solution: Use Recursion

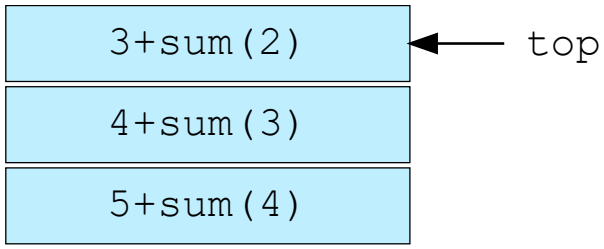
The sum is calculated by adding the sum of previous numbers down to 1.

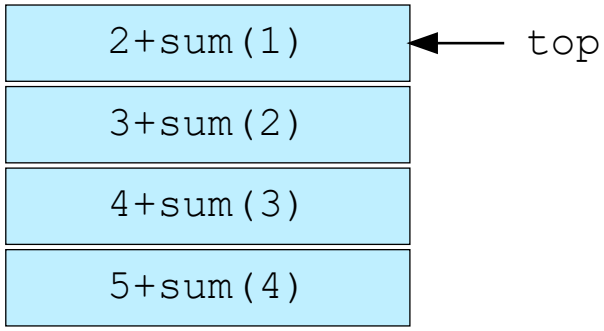
```
f(1) = 1 # base case
f(n) = f(n-1) + n # recursive case
```

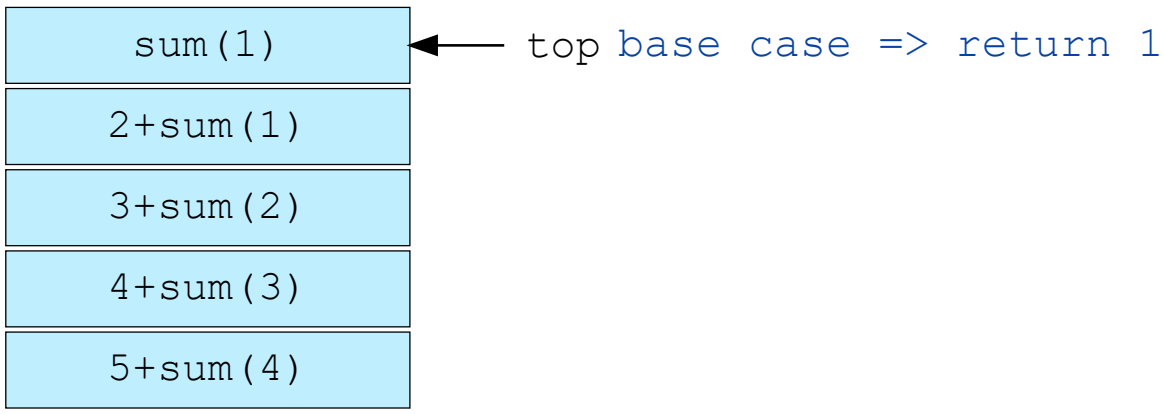
The recursion stops when n is less than or equal to 1. The following illustration explains how to calculate the sum of the first **n** natural numbers using recursion.

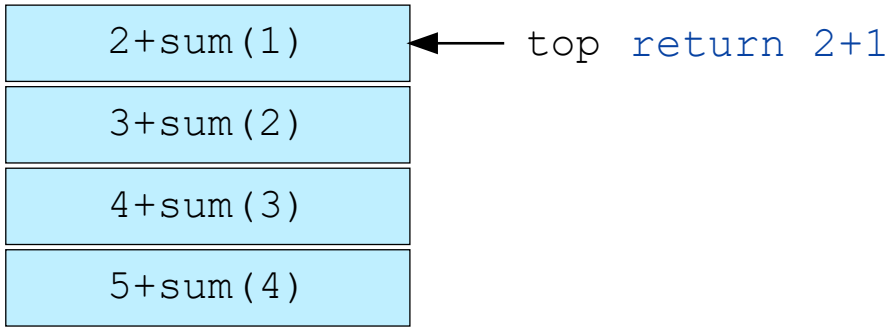


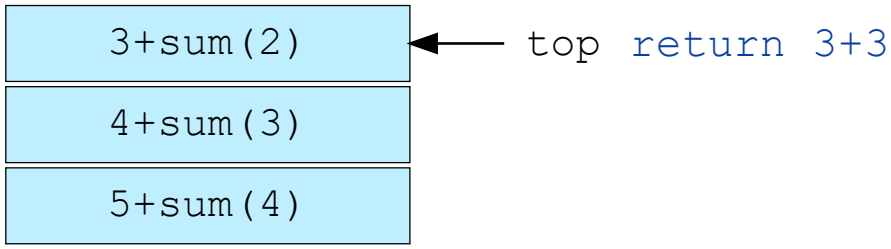

4+sum(3)
top
5+sum(4)

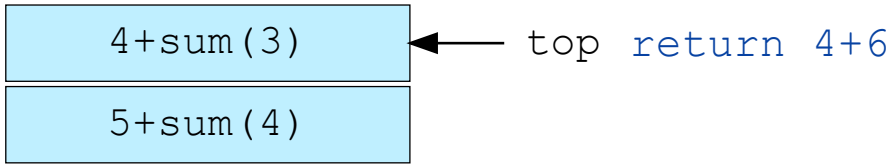

3+sum(2)
top
4+sum(3)
5+sum(4)

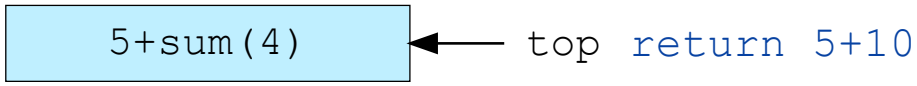

2+sum(1)
top
3+sum(2)
4+sum(3)
5+sum(4)

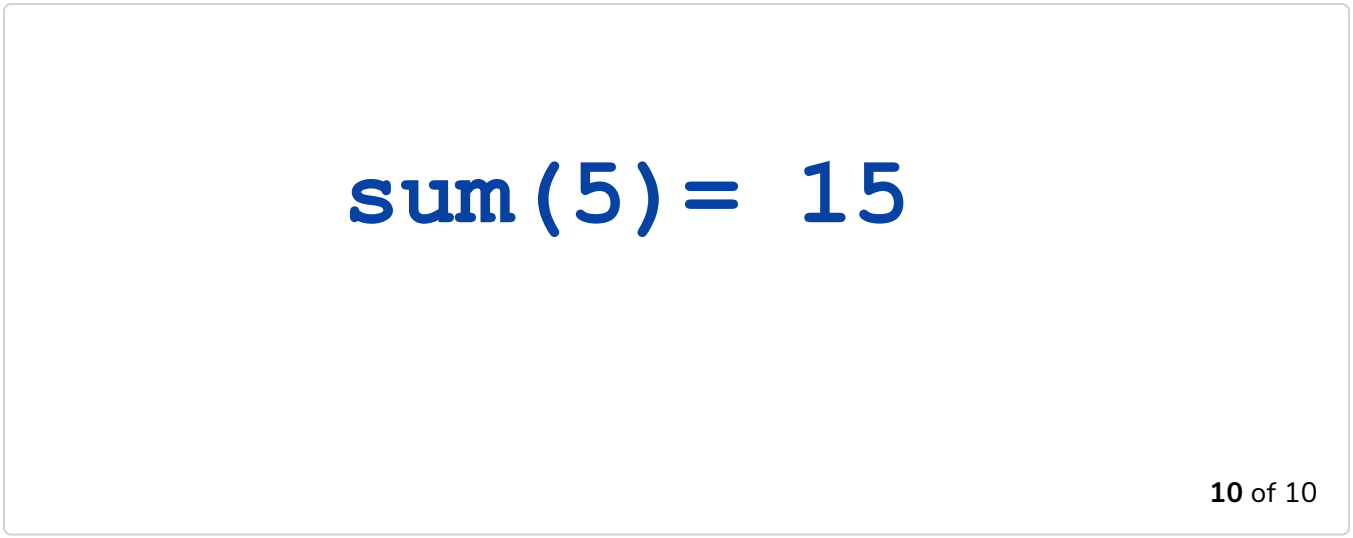

sum(1)
top
base case => return 1
2+sum(1)
3+sum(2)
4+sum(3)
5+sum(4)


2+sum(1)
3+sum(2)
4+sum(3)
5+sum(4)
top return 2+1


3+sum(2)
4+sum(3)
5+sum(4)
top return 3+3


4+sum(3)
5+sum(4)
top return 4+6


5+sum(4)
top return 5+10



The following python code demonstrates how to compute the sum of first n numbers using recursion.

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

print(sum_N_Numbers(5))
```

Now that you have the insight of modules, functions, and recursion, let's move on to the quiz.