



# Recursive version

- An alternative is to think of this computation as:

$$a * b = a + a + \dots + a$$


b copies

$$= a + a + \dots + a$$



b-1 copies

$$= a + a * (b - 1)$$

# Recursion

- This is an instance of a **recursive** algorithm
  - Reduce a problem to a simpler (or smaller) version of the same problem, plus some simple computations
    - **Recursive step**
  - Keep reducing until reach a simple case that can be solved directly
    - **Base case**
- $a * b = a$ ; if  $b = 1$  (**Base case**)
- $a * b = a + a * (b-1)$ ; otherwise (**Recursive case**)

```
def recurMul(a, b):  
    if b == 1:  
        return a  
    else:  
        return a + recurMul(a, b-1)
```