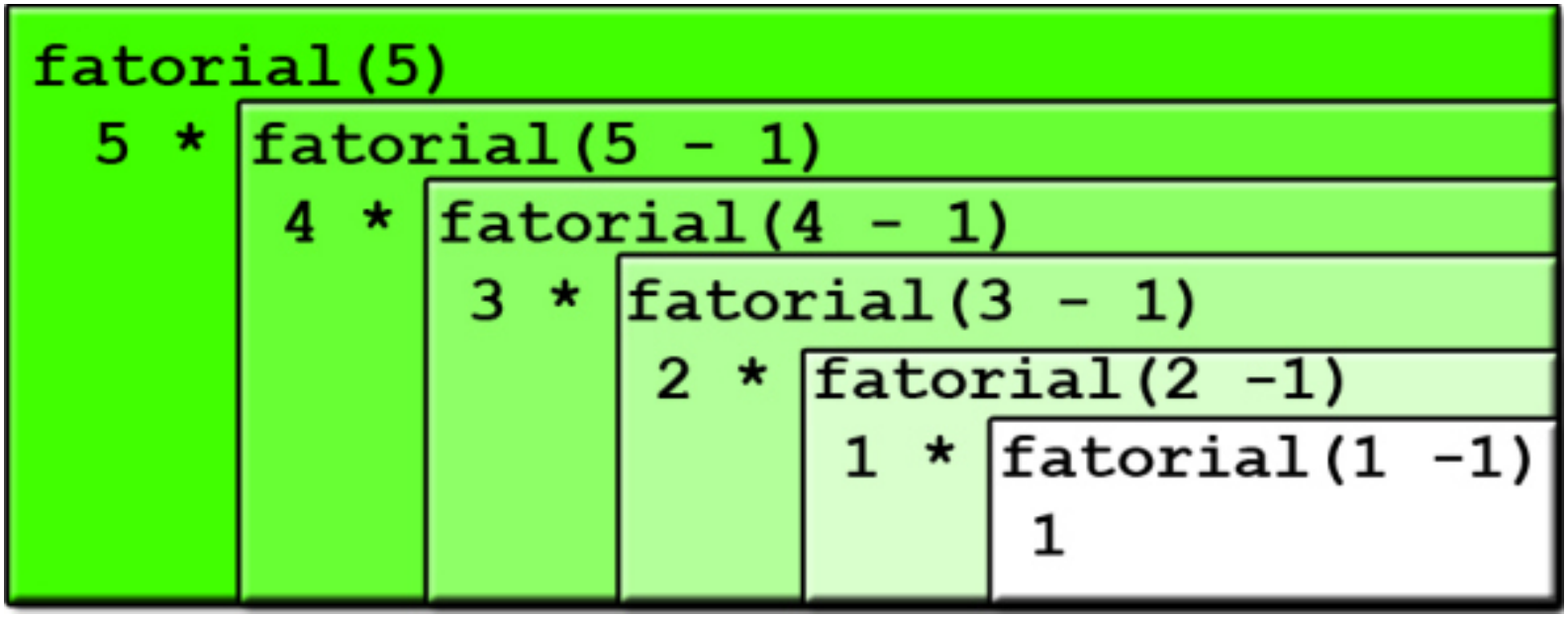
Fatorial



Fonte:

https://olamundo0.wordpress.com/2010/04/20/recursividade/

Fatorial recursivo

$$n! = \begin{cases} 1, & \text{quando } n = 0, \\ n \times (n-1)!, & \text{quando } n > 0. \end{cases}$$

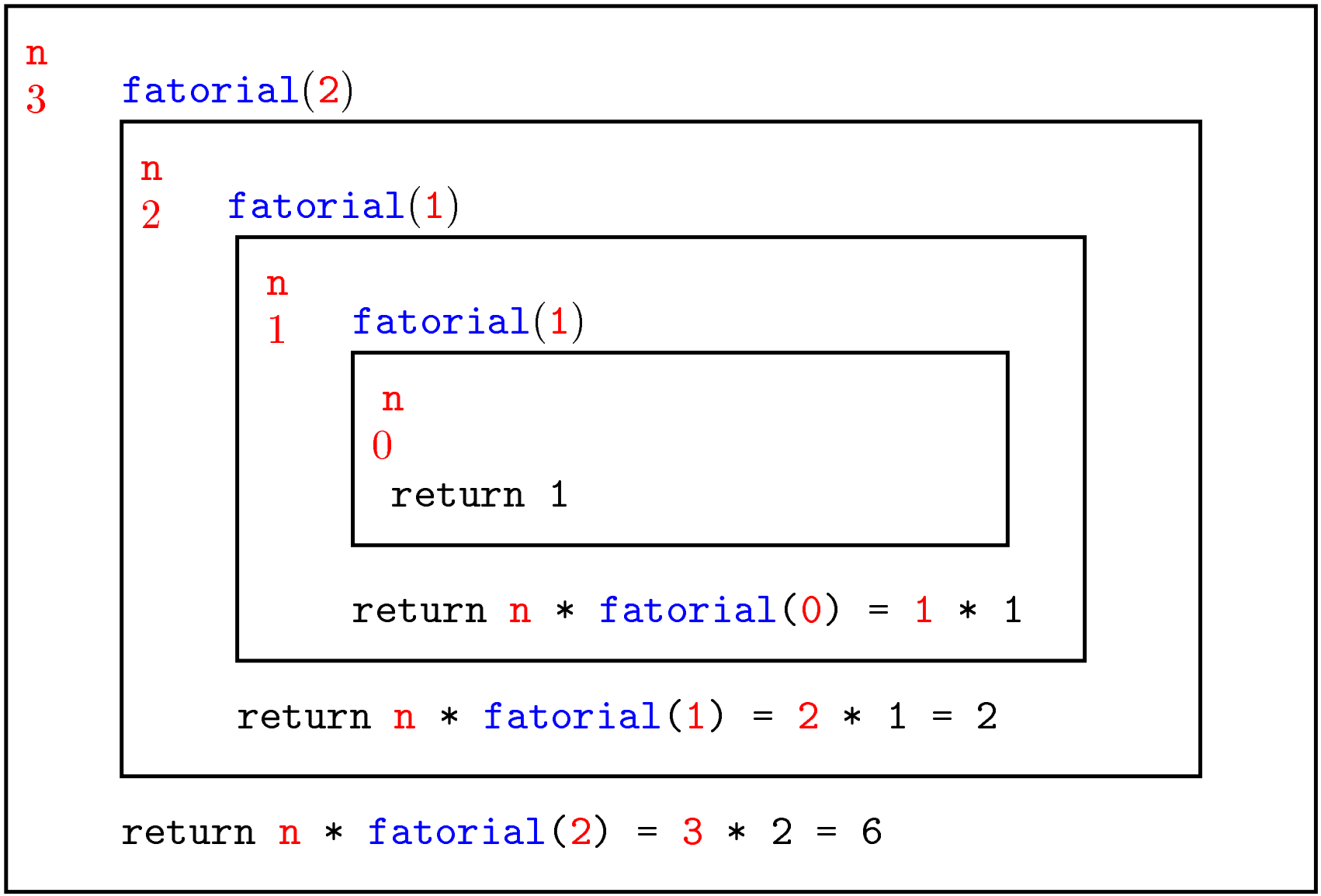
```
def fatorial(n)
    '''(int) -> int
    Recebe um inteiro n e retorna n!
    '''
    if n == 0:
        return 1
    return n * fatorial(n-1)
```

fatorial(10)

```
fatorial(10)
  fatorial(9)
    fatorial(8)
      fatorial(7)
        fatorial(6)
          fatorial(5)
            fatorial(4)
              fatorial(3)
                fatorial(2)
                  fatorial(1)
                    fatorial(0)
fatorial de 10 e' 3628800.
```

Diagramas de execução

fatorial(3)



```
hanoi(2,'A','B','C')
```

```
hanoi(1,'A','C','B')
```

```
hanoi(0,'A','B','C')
```

1: mova o disco 1 do pino A para o pino B.

```
hanoi(0,'B','A','B')
```

2: mova o disco 2 do pino A para o pino C.

```
hanoi(1,'B','A','C')
```

```
hanoi(0,'B','C','A')
```

3: mova o disco 1 do pino B para o pino C.

```
hanoi(0,'A','B','C')
```

Fatorial iterativo

```
def fatorial(n):
    '''(int) -> int
    Recebe um inteiro n e retorna n!
    '''
    ifat = 1
    for i in range(2,n+1):   # /*1*/
        ifat *= i

    return ifat
```

Em /*1*/ vale que ifat == (i-1)!