Curse and Recurse

OR

WHAT THE SHIT IS RECURSION

recursion

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Did you mean: ***recursion***

re·cur·sion

/riˈkərZHən/

noun MATHEMATICS LINGUISTICS

the repeated application of a recursive procedure or definition.

- a recursive definition.
  plural noun: **recursions**

Translations, word origin, and more definitions

(shit’s confusing)

A *recursive definition* expresses the problem in terms of a smaller version of the same problem; the definition *recurs* in the solution.

Fibonacci Sequence
f(n) = f(n-1) + f(n-2)

Factorials
5! = 5 × 4!
4! = 4 × 3!

n! = n(n-1)!

F That
To clean your apartment, you clean each room.

To clean a room, you clean all the things in it.

The secret to thinking about recursion is to ask yourself “would it help if I had the answer to a slightly smaller version of the same problem?”

HOW THE SHIT DOES RECURSION

The Call Stack

The call stack is how a computer keeps track of what it's doing, even though it's stupid

```
1  function someShit(num) {
2    var intermediaryStep = someOtherShit(num)
3
4    return intermediaryStep - 1
5  }
6
7  function someOtherShit(num) {
8    return 2 * num
9  }
10
11 someShit(5)
```

someOtherShit(5)
num = 5
return value = 10

someShit(5)
num = 5
intermediaryStep = 10
return value = 9

That’s all you need to do recursion!

(technically)

(hey cue up that example you queued up)

But this is the real world, homie

Infinite loops are a bad habit

that will get me fired

A *recursive definition* expresses the problem in terms of a smaller version of the same problem; the definition *recurs* in the solution.

- When you call the inner version of your function, call it on a smaller version of the problem.
- When you get to the simplest version of the problem, break the chain and return the answer to the previous step in the chain.

The relationship of the smaller subproblem to the whole problem is called the `recursive substructure`

The simplest version of the problem is the `base case`

Pro Tip:

Write the base case first.

Other Pro Tip:

Some problems have more
than one base case

Gettin’ Fibonacci With It

A really good resource:

https://www.cs.hmc.edu/csforall/