Overlapping Subproblems

A problem has **overlapping subproblems** if finding its solution involves solving the *same* subproblem multiple times.

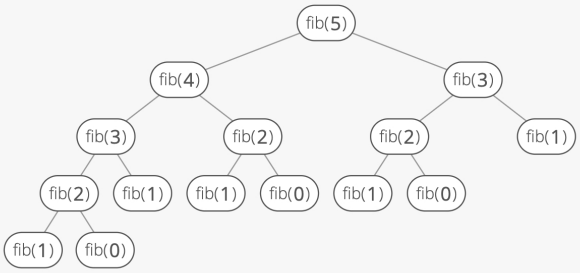
As an example, let's look at the Fibonacci sequence (the series where each number is the sum of the two previous ones—0, 1, 1, 2, 3, 5, 8, ...).

If we wanted to compute the nth Fibonacci number, we could use this simple recursive algorithm:

```
Python 3.6
def fib(n):
    if n == 0 or n == 1:
        return n
    return fib(n - 1) + fib(n - 2)
```

We'd call `fib(n - 1)` and `fib(n - 2)` **subproblems** of `fib(n)`.

Now let's look at what happens when we call `fib(5)`:



Our function ends up recursively calling `fib(2)` ***three times***. So the problem of finding the nth Fibonacci number has overlapping subproblems.

← course home

Next up: Memoization →

- Dropbox interview questions
- eBay interview questions
- LinkedIn interview questions
- Oracle interview questions
- PayPal interview questions
- Yahoo interview questions
- C++ interview questions
- C interview questions
- Swift interview questions
- Objective-C interview questions
- PHP interview questions
- C# interview questions

228 Park Ave S #82632, New York, NY US 10003 (862) 294-2956