SiteBuilding.acadEMy

Programming Techniques

TAIL CALL OPTIMIZATION

Recursion - what?

Recursion is a method of solving problems based on the divide and conquer mentality. The basic idea is that you take the original problem and divide it into smaller (more easily solved) instances of itself, solve those smaller instances (usually by using the same algorithm again) and then reassemble them into the final solution.

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Let's take a small example

Fibonacci Sequence

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, ...

The Rule is: x(n) = x(n - 1) + x(n - 2), where x(0) == x(1) == 1

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Let's take a small example

```
fibo = (val) => {
  if (val == 0 || val == 1) {
    return 1;
  }

  return fibo(val - 1) + fibo(val - 2);
};

console.log(fibo(10)); // => 89
```

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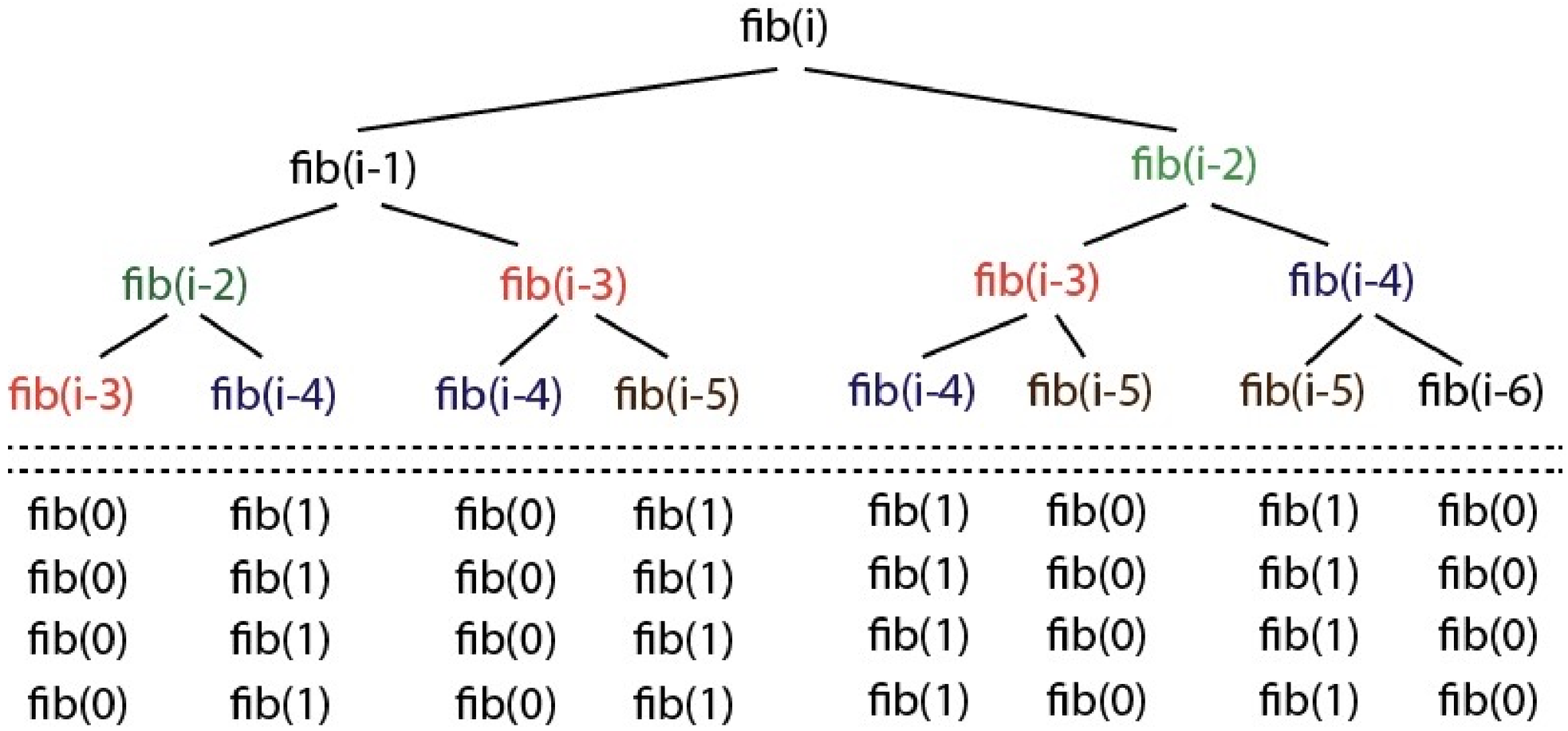
What is the problem?



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What is Tail Call optimization?

Tail-call optimization is where you are able to avoid allocating a new stack frame for a function because the calling function will simply return the value that it gets from the called function.

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Tail Call optimization - code example

```
fibo = (index, current, next) => {
  if (index == 0) return current;

  return fibo(index - 1, next, current + next);
};

console.log(fibo(10, 1, 1)); // => 89
```

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Thank you!

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