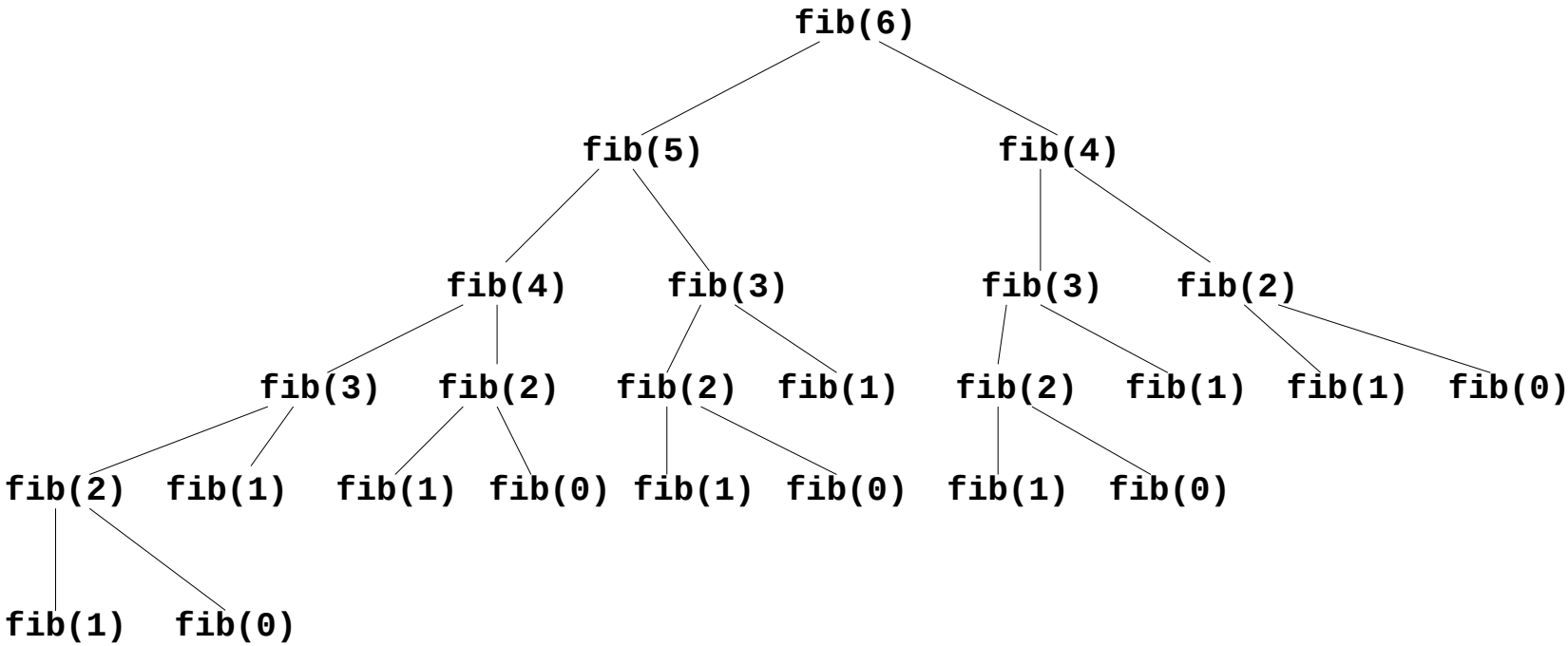
fib(6)
fib(5)
fib(4)
fib(4)
fib(3)
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fib(2)
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fib(2)
fib(2)
fib(1)
fib(2)
fib(1)
fib(1)
fib(0)
fib(1)
fib(0)
fib(1)
fib(0)
fib(2)
fib(1)
fib(1)
fib(0)
fib(1)
fib(0)

$$C[24][2] = \min \begin{cases} \text{use 13-ducat coin, } 1 + C[11][2] \\ \\ \text{don't use 13-ducat coin, } C[24][1] \end{cases}$$

Generalized:

$$C[i][j] = \min \begin{cases} 1 + C[i - D[j]][j] & \text{take the } j\text{th denomination,} \\ & \text{which value } D[j] \\ \\ C[i][j-1] & \text{skip the } j\text{th denomination} \end{cases}$$

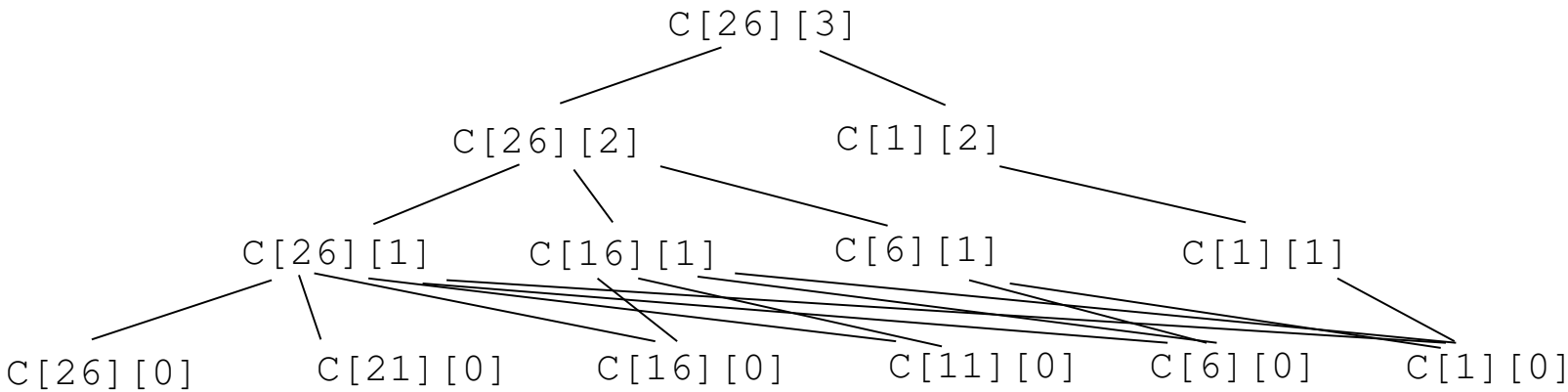
Recursive case (how many of the jth denomination coins should we take when making change for amount i?)

$$C[i][j] = \min_{0 \leq k < x} \{k + C[i - k \cdot D[j]][j - 1]\}$$

x is the exclusive upper bound on how many jth denomination coins we *could* take, the smallest x such that $x \cdot D[j] > i$.

Base case:

$$C[i][0] = i$$


C[26][3]
C[26][2]
C[1][2]
C[26][1]
C[16][1]
C[6][1]
C[1][1]
C[26][0]
C[21][0]
C[16][0]
C[11][0]
C[6][0]
C[1][0]

Recursively characterizing the problem/solution:

$$C[i][j] = \begin{cases} i & \text{if } j = 0 \\ \min_{0 \le k < x}\{k + C[i - k \cdot D[j]][j-1]\} & \text{otherwise} \end{cases}$$

Realizing this in pseudocode:

For $i \in [1, amount]$ // loop over all sub-amounts
    For $j \in [0, D.length)$ // loop over all denomination restrictions
        // find the number of j coins that minimizes
        // the total number of coins for sub-amount i
        // using up to denomination j
        Guess the min k is 0
        For $k \in [1, x)$
            //If k gets a smaller value than the min so far,
            // make that the new min k
        Record the min value as $C[i][j]$

$D = [1, 5, 10, 25]$, $amount = 26$

j \ i	0	1	2	3	4	5	6	...	10	11	...	16	...	21	...	26
3	0/0	0/1	0/2	0/3	0/4	0/1	0/2		0/1	0/2		0/3		0/3		1/2
2	0/0	0/1	0/2	0/3	0/4	0/1	0/2		1/1	1/2		1/3		2/3		2/4
1	0/0	0/1	0/2	0/3	0/4	1/1	1/2		2/2	2/3		3/4		4/5		5/6
0	0/0	1/1	2/2	3/3	4/4	5/5	6/6		10/10	11/11		16/16		21/21		26/26

$D = [1, 12, 13]$, $amount = 24$

j								
	2	0/0	0/1		0/11	0/1	1/1		0/2
	1	0/0	0/1		0/11	1/1	1/2		2/2
	0	0/0	1/1		11/11	12/12	13/13		24/24
		0	1	...	11	12	13	...	24
						i			