Backtracking (Búsqueda Completa)

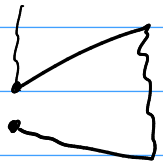
Pila

```
fun (n):
    m = n*2
    x = g(m)
    ret n*x
```

subrutina

```
m = n*2
PUSH m
CALL g
RET
```

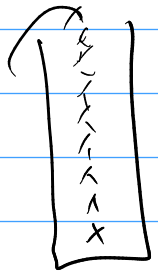
```
g:
POP //saca m
RET
```



fact(5) = 5 · fact(4)

if (

stack overflow



1 1

1 2 = 2

2 · 3 = 6

6 · 4 = 24

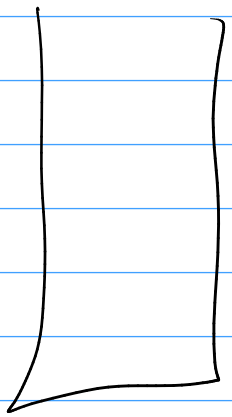
24 · 5 = 120

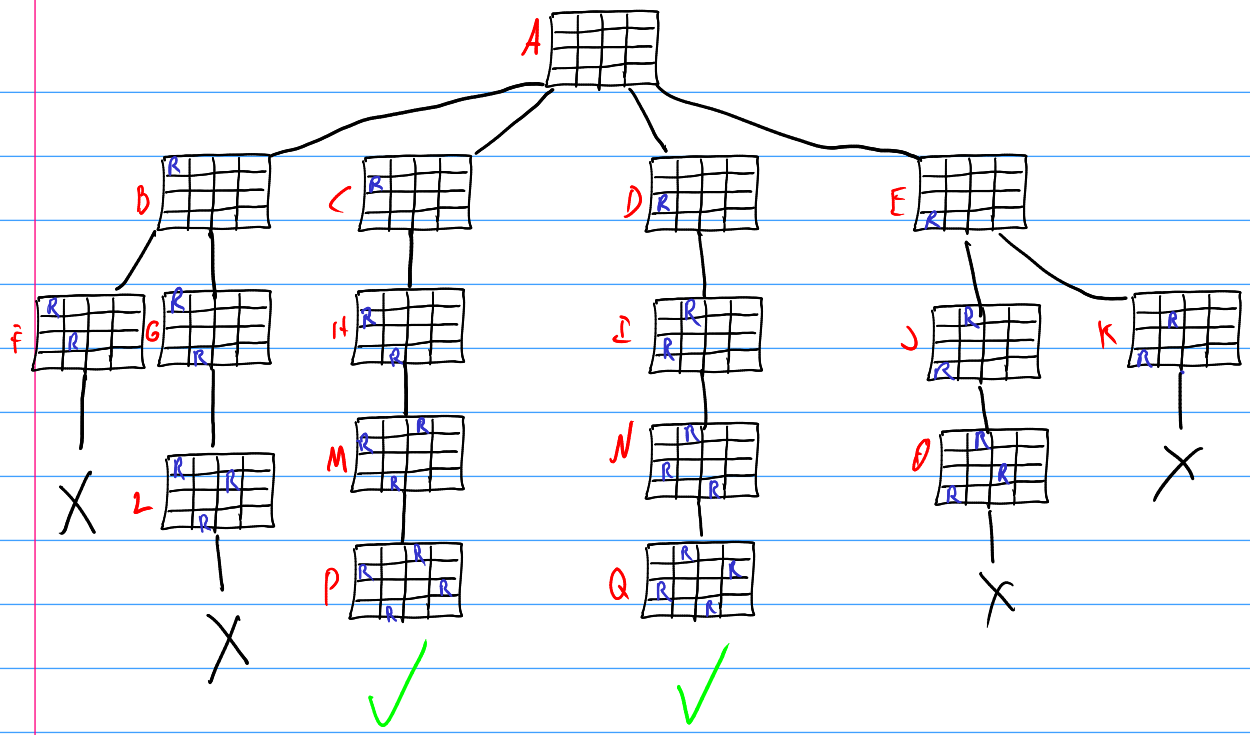
f(3)

f(2) + f(1)

0 + 1 = 1

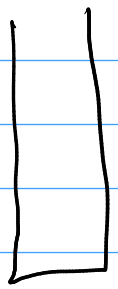
1 + 1 = 2





P Q

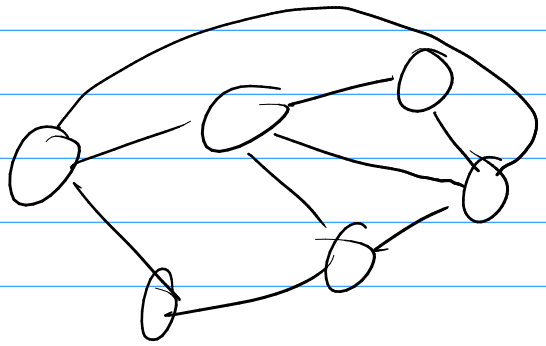
```
while (!Pila.isEmpty()) {
    t ← Pila.top()
      Pila.pop()
    if (t. es solucion) // haga algo
    else {
      for i in hijos(T) {
          Pila.push(i)
    }}
```



Problemas modelo de Backtracking:

Coloreo de grafos

↳ le pongo un color a cada nodo tq dos vecinos NO comparten color

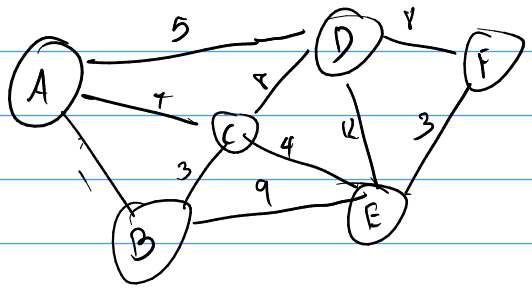


¿Cuál es el mínimo # de colores para lograrlo?

---

horarios → NP-hard.

Vendedor Viajero : Camino hamiltoniano mínimo

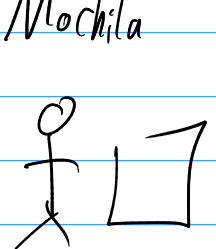


Fleary

puentes de Königsberg

camino euleriano

Mochila



$x_i \in \{1, 0\}$

$$\max \sum_{i=1}^{n} p_i \cdot x_i$$

$$\sum_{i=1}^{n} c_i x_i \leq K$$

2^n

Laberintos