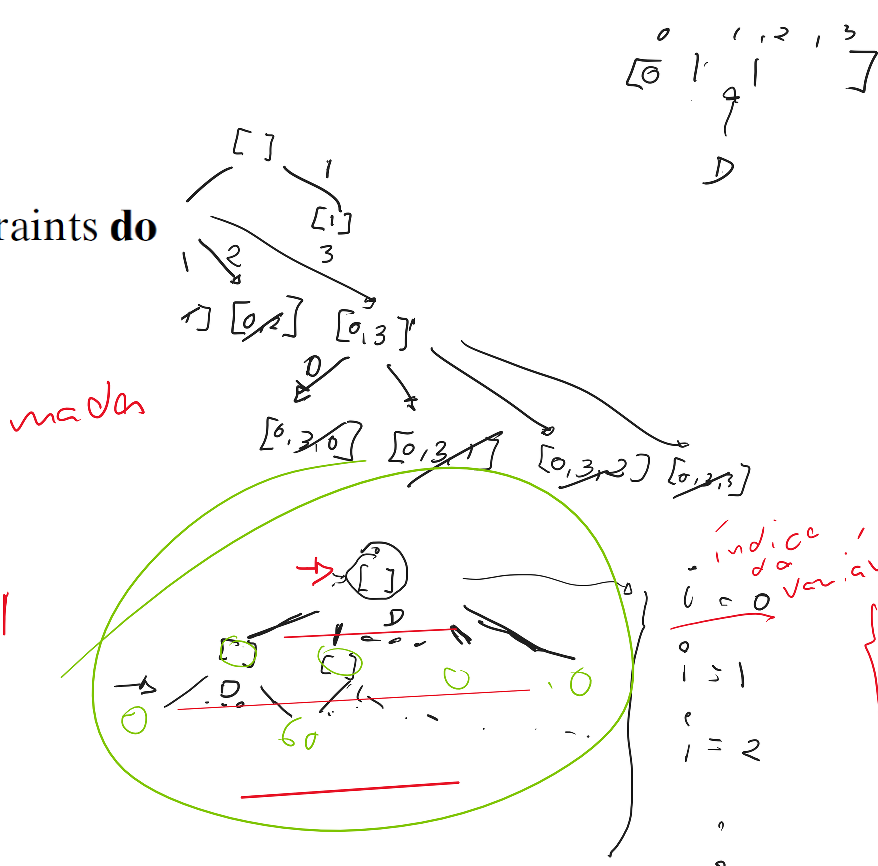
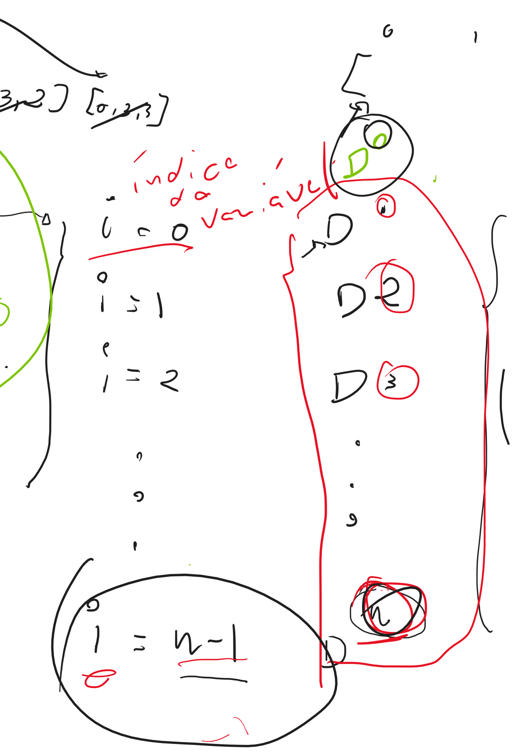
ALGORITHM *Backtrack*($X[1..i]$)

//Gives a template of a generic backtracking algorithm
//Input: $X[1..i]$ specifies first i promising components of a solution
//Output: All the tuples representing the problem's solutions
if $X[1..i]$ is a solution **write** $X[1..i]$
else //see Problem 9 in this section's exercises
  for each element $x \in S_{i+1}$ consistent with $X[1..i]$ and the constraints **do**
    $X[i+1] \leftarrow x$
    Backtrack($X[1..i+1]$)





$n-1 \; T(n-1, D) + CS$ custo da chamada

$$T(n,D) = D\,T(n-1, D) + 1 \qquad T(0,D) = 1$$

$$= D\left(D\,\underbrace{T(n-2, D)} + 1\right) + 1$$

$$= D\left(D\left(D\,T(n-3) + 1\right) + 1\right) + 1$$

$$= D\left(D\left(D\left(D\,T(n-4) + 1\right) + 1\right) + 1\right) + 1$$

$$= D\left(D\left(D^2\,T(n-4) + D\right) + 1\right) + 1 \Big) + 1$$

$$= D\left(D^3\,T(n-4) + D^2 + D\right) + 1 \Big) + 1$$

$$= D^4\,T(n-4) + D^3 + D^2 + D + 1$$

$$= D^i\,T(n-i) + \sum_{j=0}^{i-1} D^j$$

$$i = n$$

$$= D^n\,\cancel{T(0)}^{\,1} + \sum_{j=0}^{n-1} D^j$$

$$D^n \qquad (D^0 + D^1 + D^2 \dots + D^{n-1})$$

$$= \sum_{j=0}^{n} D^j = \frac{1 - D^{n+1}}{1 - D}$$

$$\sum_{i=0}^{n} D^i = \frac{1 - D^{n+1}}{1 - D}$$

$$D^1 + D^2 + D^3 \dots + D^n$$

$$= \frac{D^n(D+1) - D - 1}{D - 1}$$