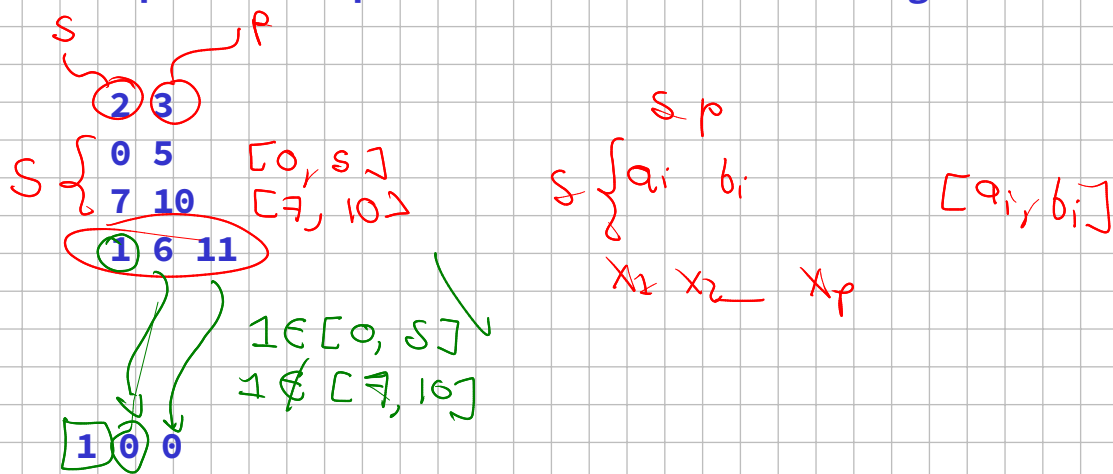
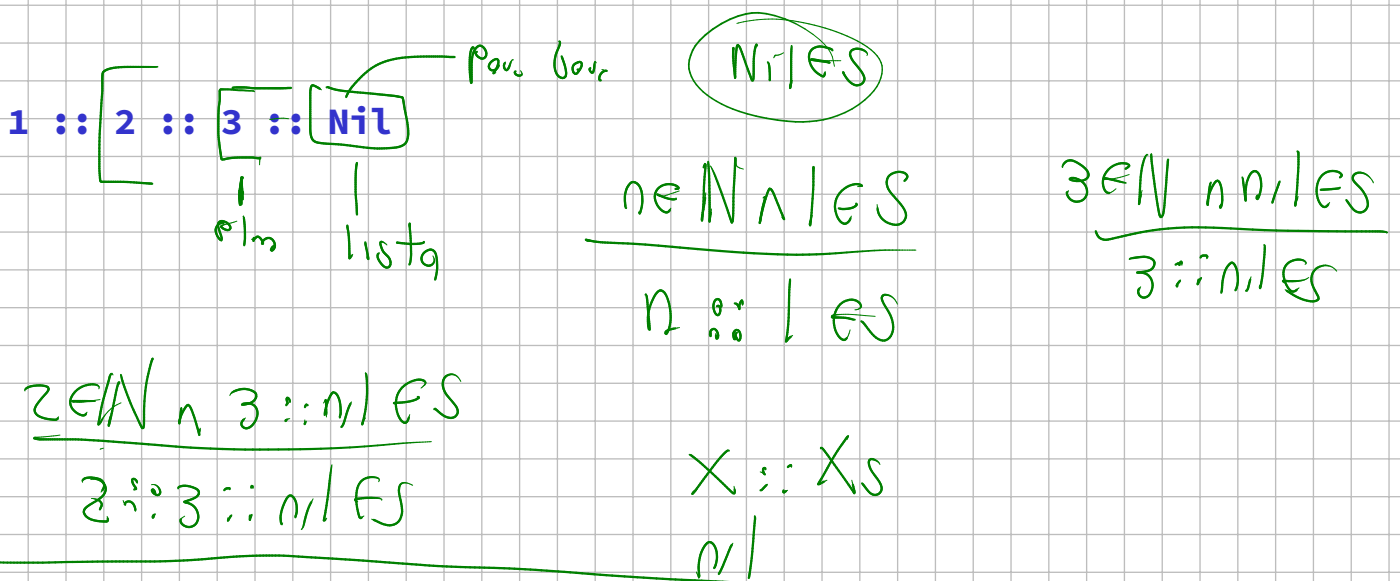


Explicación primera entrada tarea integradora



Lista



$$\Sigma = \{a, b, c\}$$

$$\Sigma^* = \{ \epsilon, a, b, c, aa, ab, ac, ba, bb, \dots \}$$

$$C_{a,b,c} \quad y=1 \quad |C(xy) = |C(x) + |C(y)$$

$$|C(xh) = |C(x) + |C(h)$$

$$|C(xh) = |C(x) + 0$$

$$|C(xh) \neq |C(x) \quad \checkmark$$

$$|(x, y)| = |x| + |y|$$

T

$\underbrace{4}_{\text{caso}}$

$\underbrace{5}_{\text{primo}}$

$$|(x, y)| = |x| + |y|$$

$$|(x, y)| = |x| + |y| + |1|$$

$$|(x, y)| = |x| + |y| + 1$$

Suponga que $a_{m,n}$ se define recursivamente para $(m, n) \in \mathbb{N} \times \mathbb{N}$ por $a_{0,0} = 0$ y

$$\rightarrow a_{m,n} = \begin{cases} a_{m-1,n} + 1 & \text{si } n = 0 \text{ y } m > 0 \\ a_{m,n-1} + n & \text{si } n > 0. \end{cases}$$

Demuestre que $a_{m,n} = m + n(n+1)/2$ para todo $(m, n) \in \mathbb{N} \times \mathbb{N}$, esto es, para todos los pares de enteros no negativos.

$$\begin{aligned} \rightarrow a_{3,0} &= a_{2,0} + 1 = 3 \\ a_{2,0} &= a_{1,0} + 1 = 2 \\ a_{1,0} &= a_{0,0} + 1 = 1 \\ a_{0,0} &= 0 \end{aligned}$$

$$a_{m,n} = m + \frac{n(n+1)}{2}$$

$$a_{3,4} = a_{2,4} + 4 = 13$$

$$a_{3,3} = a_{2,3} + 3 = 9$$

$$a_{3,2} = a_{2,2} + 2 = 6$$

$$a_{3,1} = a_{2,1} + 1 = 4$$

$$a_{3,0} = 3 + \frac{0(1)}{2} = 3$$

$$a_{3,4} = 3 + \frac{4(5)}{2} = 13$$

Para estudiar el siguiente ejemplo consideramos el denominado *orden lexicográfico* de $\mathbb{N} \times \mathbb{N}$, el cual define un orden para las parejas de enteros no negativos. El par (x_1, y_1) es menor o igual que (x_2, y_2) si $x_1 < x_2$ o $x_1 = x_2$ y $y_1 < y_2$.

1) Caso base $n=0$ y $m=0$

$$0 = 0 + \frac{0(1)}{2}$$

$$0 = 0 \checkmark$$

$$a_{0,0}$$

2) Paso inductivo

$$\boxed{a_{m,n} = m + \frac{n(n+1)}{2}} \quad T$$

$$n=0 \quad a_{m,0} < a_{m+1,0}$$

$$m+0 < m+1+0$$

$$0 < 1 \quad (T)$$

$$n > 0$$

$$a_{m,n} < a_{m,n+1}$$

$$n \in \mathbb{N}$$

$$m + \frac{n(n+1)}{2} < m + \frac{(n+1)(n+2)}{2}$$

$$n+1 \neq 0$$

$$n \neq 0$$

$$n(n+1) < (n+1)(n+2)$$

$$n < n+2$$

$$0 < 2 \quad (T)$$