$$T(n)\begin{cases} T(1) = 1 \\ T(n) = 2T\left(\frac{n}{3}\right) + n - 1 \end{cases}$$

$n = 3^m$ k iterador

$$\left(T(3^m) - 2T(3^{m-1}) = 3^m - 1\right) 2^0$$

$$\left(T(3^{m-1}) - 2T(3^{m-2}) = 3^{m-1} - 1\right) 2^1$$

$$\left(T(3^{m-2}) - 2T(3^{m-3}) = 3^{m-2} - 1\right) 2^2$$

$$\left(\underbrace{T(3^k)}_{a_k} - \underbrace{2T(3^{k-1})}_{a_{k-1}} = 3^k - 1\right) 2^{m-k}$$

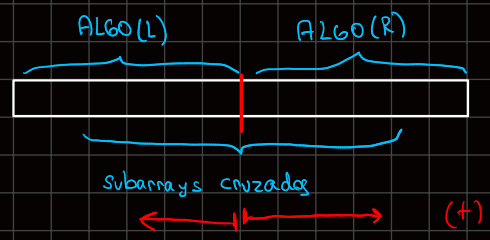
$$a_k = 2^{m-k}\, T(3^k)$$

$$a_n - a_0$$

	1	2	3	4	5	6
A	-23	18	20	-7	12	-5

Maximum subarray

Divide & Conquer




```
Algo(A,p,r)        \\ devuelve el max. subarray de A[p...r]
  if(p==r)
    return A[p]

  q = ⌊(p+r)/2⌋
  T1 = Algo(A,p,q)
  T2 = Algo(A,q+1,r)
  T3 = Cruzado(A,p,q,r)

  return max{T1,T2,T3}
```

Complejidad:

$$T(n) = 2T\left(\left\lfloor \frac{n}{2} \right\rfloor\right) + \underbrace{\Theta(n)}_{\text{Extremo}} = \Theta(n \lg n)$$

Multiplicación Básica

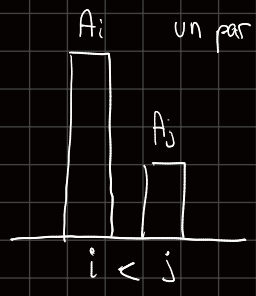
Algo (A,B)

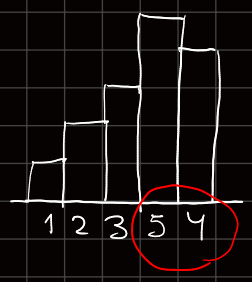
$$\begin{array}{r} 23 \\ \times\ 45 \\ \hline 15 \\ 10 \\ 12 \\ 8 \\ \hline 1035 \end{array} \qquad \begin{array}{r} 12 \\ \times\ 34 \\ \hline 56 \\ 78 \\ \hline \end{array}$$

Counting inversions

1 2 3 4 5	1 2 3 5 4	5 1 4 2 3	5 4 3 2 1
Ordenado	casi ordenado	desordenado	• El array más desordenado
0	1	6	10

• Queremos un parámetro que nos ayude a definir qué tan desordenado está un array





El valor de la izq es mayor del valor de la der.

1 = Inversión

•