

## ESERCIZIO 10 - 2° PARTE

MAXDIFF(A[1..2m])

$A_x = \text{QUICKSORT}(A[1..2m])$

return ( $A_x[1], A_x[2m]$ )

MAXBEN(A[1..2m])

$A_x = \text{QUICKSORT}(A[1..2m])$

$B = A_x[1..m]$

$C = A_x[m+1..2m]$

return (B, C)

## ESERCIZIO 11 - 2° PARTE

QUICKSORT2(A[1..n])

PRENDI a e b da A

$A_1 = \{x \in A : x < a \text{ e } x < b\}$      $A_3 = \{x \in A : x > a \text{ e } x < b\}$

$A_2 = \{x \in A : x \notin A_1 \text{ e } x \notin A_3\}$

return (QUICKSORT2( $A_1$ ), QUICKSORT2( $A_2$ ), QUICKSORT2( $A_3$ ))

2m confronti

$$T(n) = \begin{cases} c & \text{se } n=1 \\ 3(T(n/3)) + 2n \end{cases}$$

$$T(n) = 3T(n/3) + 2n$$

$$T(n/3) = 3T(n/9) + 2n/3$$

$$T(n) = 3(3T(n/9) + 2n/3) + 2n$$

$$T(n/9) = 3T(n/27) + 2n/9$$

$$T(n) = 3(3(3T(n/27) + 2n/9) + 2n/3) + 2n$$

$$T(n) = 3^i T(n/3^i) + 2n - 1$$

$$T(1) = 1 = \log_3 n$$

$$T(n) = 3^{\log_3 n} T(1) + 2n - \log_3 n$$

$$T(n) = nT(1) + 2n \log_3 n = \Theta(n \log_3 n)$$

$$T(n) = 2n + 2n \log_3 n$$

~~$$T(n) = 3T(n/3) + 2n$$~~

$$3^3 T\left(\frac{n}{3^3}\right) + 2n + 2n + 2n$$

$$3^i T\left(\frac{n}{3^i}\right) + \sum_{j=1}^i 2n = i 2n$$