

```

MERGESORT(A)
  n=len(A)
  if n<=1:
    return A
  L=MERGESORT(L(A))
  R=MERGESORT(R(A))
  return MARGE(L,R)

```

1 mergesort runtime

note the first 3 lines are $O(1)$

$$\begin{aligned}
 T(n) &\leq 2T(n/2) + O(n) \\
 &\leq 2T(n/2) + cn
 \end{aligned}
 \tag{1}$$

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