```
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)
hello