Deterministic Selection

SELECT(**A,i,n**)

```
1  if (n = 1)
2        return A[1]

3  p = MEDIAN(A)
4
5

6  L = {x ∈ A : x ≤ p}
   H = {x ∈ A : x > p}

7  if i ≤ |L|
8        SELECT(L, i, |L|)
9  else SELECT(H, i − |L|, |H|)
```

Deterministic Selection (2)

SELECT(**A,i,n**)

1 **if** $(n = 1)$
2 **return** A

3 **Split the items into** $\lfloor n/5 \rfloor$ **groups 5 (and one more group).**
Call these groups $G_1, G_2, \ldots, G_{\lfloor n/5 \rfloor}$
4 **Find the median** m_i **of each** G_i
5 **Recursively compute the median of medians,**
p = SELECT$(\{m_1, \ldots, m_{\lfloor n/5 \rfloor}\}, \lfloor n/10 \rfloor, \lfloor n/5 \rfloor)$

6 $L = \{x \in A : x \leq p\}$
$H = \{x \in A : x > p\}$

7 **if** $i \leq |L|$
8 SELECT$(L, i, |L|)$
9 **else** SELECT$(H, i - |L|, |H|)$

Proof