Lab 5

Select

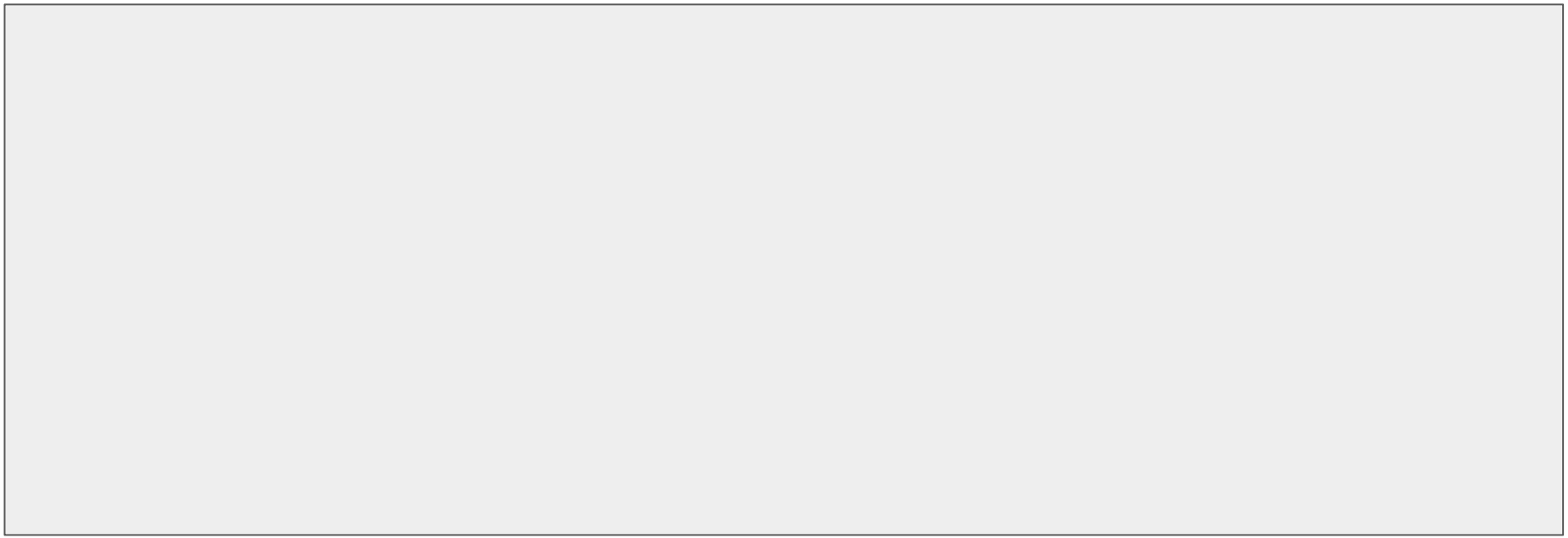
Select

https://leetcode.com/problems/kth-largest-element-in-an-array/?envType=problem-list-v2&envId=quickselect

No sorting allowed!

Hints

Divide Hint



Conquer Hint

Runtime Analysis

$$select(S, k)$$
$$= \begin{cases} select(S_<, k), & k \leq |S_<| \\ p, & |S_<| < k \leq |S_<| + |S_=| \\ select(S_>, k - |S_<| - |S_=|), & otherwise \end{cases}$$

Master Theorem

If $T(n) = aT(n/b) + O(n^d)$ for constants $a > 0$, $b > 1$, $d \geq 0$, then

$$T(n) = \begin{cases} O(n^d) & \text{if } d > \log_b a \\ O(n^d \log n) & \text{if } d = \log_b a \\ O(n^{\log_b a}) & \text{if } d < \log_b a \end{cases}$$

How to apply it:

1. Identify a, b, and d from the recurrence relation
2. Calculate $\log_b(a)$
3. Compare d to logb(a) to determine which of the three cases applies

Lab 5 Submission

Submit your pseudo code and runtime analysis to gradescope

- No data structure discussion needed

- No correctness proof required