

Programming assignment 3.

Due date: Sunday, October 20, 2019 at 11:59pm

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Part A.

Implement a function called *Quick_select* to find the **kth least element** on a given array. (The average running time of your algorithm should be $O(n)$) (*Hint:* Use partitioning algorithm)

1. Request the user to enter a positive integer, and call it *n*.
2. Generate *n* random integers between -100 to 100 and save them in array *a*.
3. Print the generated array.
4. Request the user to enter a number between 1 to *n* (k least element).
5. Call your *Quick_select* function to find and print the kth least element.

Part B.

Modify your algorithm to return the **max k numbers** from an *unsorted* array. (The average running time of your algorithm should be $O(n)$)

(*Example:* *a* = [4 2 0 10 1 6], *k* = 3 → Output = [4 10 6])