Assignment # 5

(Deadline: 20th November 2020)

i) Write C/C++ program to compute the k closest elements from a key value x that belongs to the array $A[n]$ of n data items.

Hint:

1. PARTITION (described in QUICKSORT) the array $A[n]$ around x as the pivot.
2. For all elements to the left of x construct a *max heap*.
3. For all elements to the right of x construct a *min heap*.

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ii) Write an efficient C/C++ program that inputs a DAG (directed acyclic graph) $G = (V, E)$ and an ordering $\boldsymbol{a}$ of the vertices of G. The program returns TRUE if $\boldsymbol{a}$ is a topological sort of G or FALSE if $\boldsymbol{a}$ is not a topological sort of G.

(Assume vertices are numbered from $1..n$ where $|V| = n$)

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