Department of Computer Science and Engineering

PES UNIVERSITY

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Sequential Search

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Sequential Search

The sequential search algorithm simply compares successive elements of a given list with a given search key until either a match is encountered (successful search) or the list is exhausted without finding a match (unsuccessful search). A simple extra trick is often employed in implementing sequential search: if we append the search key to the end of the list, the search for the key will have to be successful, and therefore we can eliminate a check for the list's end on each iteration of the algorithm. Here is a pseudocode for this enhanced version, with its input implemented as an array.

AlGORITHM SequentialSearch2(A[0 .. n], K)
//Implements sequential search with a search key as a sentinel
//Input: An array A of n elements and a search key K
//Output: The index of the first element in A[0 .. n -1] whose value is
// equal to K or -1 if no such element is found
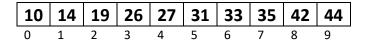A[n]<---K
i<---0
while A[i] ≠K do
        i<--- i + 1
if i < n return i
else return -1

Sequential Search is a $\Theta(n)$ algorithm.

10	14	19	26	27	31	33	35	42	44
0	1	2	3	4	5	6	7	8	9

For key = 33, 6 is returned
For key = 50, -1 is returned (50 is stored in position 10 in the array)

Another straightforward improvement can be incorporated in sequential search if a given list is known to be sorted: searching in such a list can be stopped as soon as an element greater than or equal to the search key is encountered.