A) Dictionaries

- Permits access to data items by content
- Primary operations:
  - Search(D, k)
    - given a search key k, return a pointer to one element in dict. D whose key value is k, if one exists
  - Insert(D, x)
    - given a data item x, add it to the set in dict D
  - Delete(D, x)
    - given a pointer to a given data item x in dict. D, remove it from D

Note:
Binary search trees are dictionaries

- Runtimes of common operations

Dict. Ops	Unsorted Array	Sorted Array
Search(L, k)	$O(n)$	$O(\log n)$
Insert(L, x)	$O(1)$	$O(n)$
Delete(L, x)	$O(1)$*	$O(n)$
Successor(L, x)	$O(n)$	$O(1)$
Predecessor(L, x)	$O(n)$	$O(1)$
Minimum(L)	$O(n)$	$O(1)$
Maximum(L)	$O(n)$	$O(1)$