

# LEGEND

TIME Complexity vs. SPACE Complexity

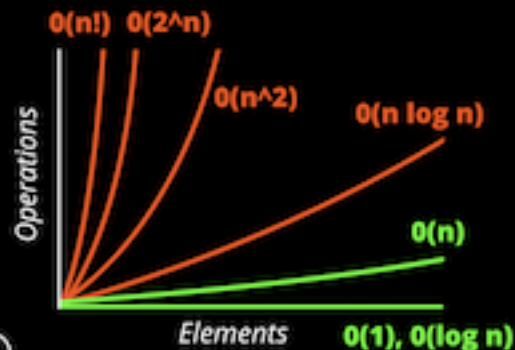
Good Fair Bad

Good Fair Bad



## <BIG-O-CHEATSHEET>

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### DATA STRUCTURE

Operations

### ARRAY SORTING

Algorithms

DATA Structure

TIME Complexity

SPACE Complexity

ARRAY Algorithms

TIME Complexity

SPACE Complexity

Average

Worst

Best

Average

Worst

Worst

Access

Search

Insertion

Deletion

Access

Search

Insertion

Deletion

Array



$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

Stack



$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

Queue



$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

Singly-Linked List



$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

Doubly-Linked List



$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

$\Theta(n)$

$\Theta(1)$

$\Theta(1)$

$\Theta(n)$

Skip List



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n \log(n))$

Hash Table



N/A

$\Theta(1)$

$\Theta(1)$

$\Theta(1)$

N/A

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

Binary Search Tree



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

Cartesian Tree



N/A

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

N/A

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

B-Tree



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

Red-Black Tree



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

Splay Tree



N/A

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

N/A

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

AVL Tree



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

KD Tree



$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(\log(n))$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

$\Theta(n)$

Quicksort



$\Omega(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n^2)$

$\Theta(\log(n))$

Mergesort



$\Omega(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n)$

Timsort



$\Omega(n)$

$\Theta(n \log(n))$

$\Theta(n \log(n))$

$\Theta(1)$

Heapsort



$\Omega(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n \log(n))$

$\Theta(1)$

Bubble Sort



$\Omega(n)$

$\Theta(n^2)$

$\Theta(n^2)$

$\Theta(1)$

Insertion Sort



$\Omega(n)$

$\Theta(n^2)$

$\Theta(n^2)$

$\Theta(1)$

Selection Sort



$\Omega(n^2)$

$\Theta(n^2)$

$\Theta(n^2)$

$\Theta(1)$

Tree Sort



$\Omega(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n^2)$

$\Theta(n)$

Shell Sort



$\Omega(n \log(n))$

$\Theta(n(\log(n))^2)$

$\Theta(n(\log(n))^2)$

$\Theta(1)$

Bucket Sort



$\Omega(n+k)$

$\Theta(n+k)$

$\Theta(n^2)$

$\Theta(n)$

Radix Sort



$\Omega(nk)$

$\Theta(nk)$

$\Theta(nk)$

$\Theta(n+k)$

Counting Sort



$\Omega(n+k)$

$\Theta(n+k)$

$\Theta(n+k)$

$\Theta(k)$

Cubesort



$\Omega(n)$

$\Theta(n \log(n))$

$\Theta(n \log(n))$

$\Theta(n)$