← Notes

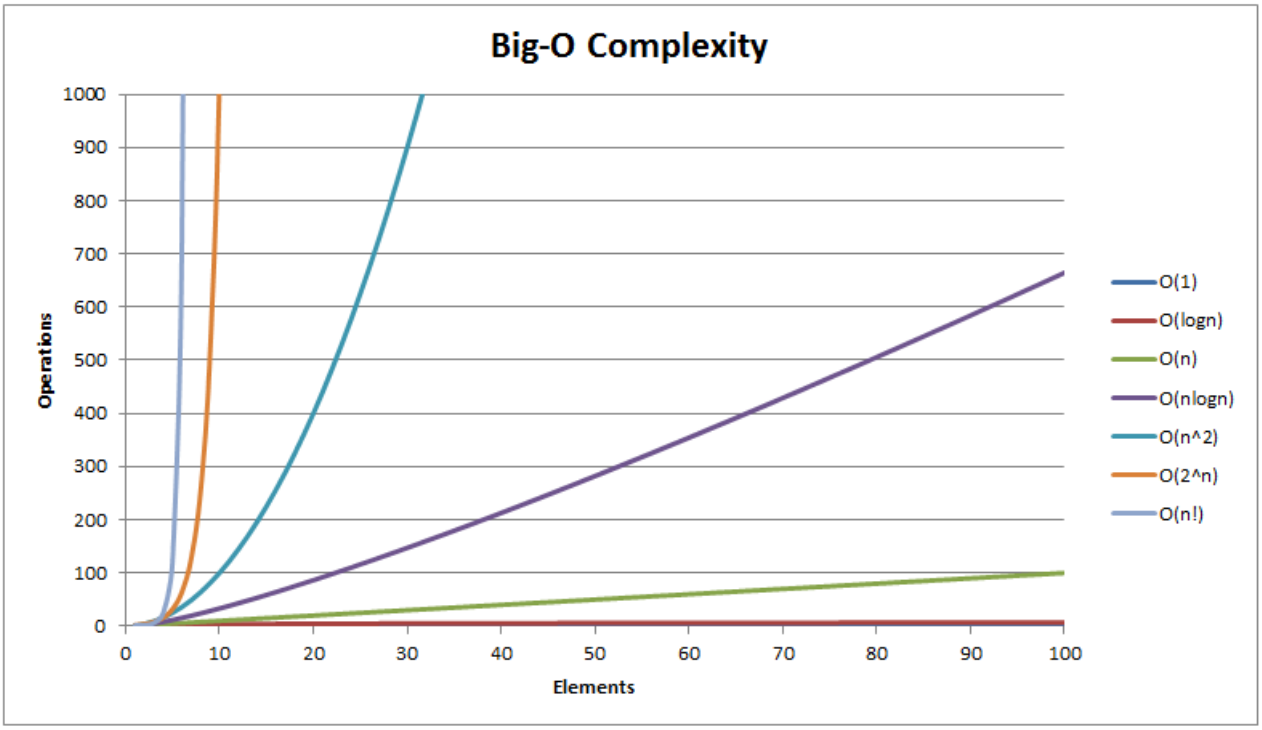
Sorting And Searching Algorithms - Time Complexities Cheat Sheet

145 Time-complexity Algorithm Analysis

Time complexity Cheat Sheet

Algorithm	Best Time Complexity	Average Time Complexity	Worst Time Complexity	Worst Space Complexity
Linear Search	O(1)	O(n)	O(n)	O(1)
Binary Search	O(1)	O(log n)	O(log n)	O(1)
Bubble Sort	O(n)	O(n^2)	O(n^2)	O(1)
Selection Sort	O(n^2)	O(n^2)	O(n^2)	O(1)
Insertion Sort	O(n)	O(n^2)	O(n^2)	O(1)
Merge Sort	O(nlogn)	O(nlogn)	O(nlogn)	O(n)
Quick Sort	O(nlogn)	O(nlogn)	O(n^2)	O(log n)
Heap Sort	O(nlogn)	O(nlogn)	O(nlogn)	O(n)
Bucket Sort	O(n+k)	O(n+k)	O(n^2)	O(n)
Radix Sort	O(nk)	O(nk)	O(nk)	O(n+k)
Tim Sort	O(n)	O(nlogn)	O(nlogn)	O(n)
Shell Sort	O(n)	O((nlog(n))^2)	O((nlog(n))^2)	O(1)

BigO Graph



*Correction:- Best time complexity for TIM SORT is O(nlogn)

COMMENTS (36) SORT BY: Relevance

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sumit kumar 4 years ago
very usefull for exam time.....!!!!
1 vote ● Reply ● Message ● Permalink

Virender Kumar 4 years ago
usefull all time not only exam :P
2 votes ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago
Thanks, All the best :)
0 votes ● Reply ● Message ● Permalink

Sameer Gupta 4 years ago
Very nice way to memorise complexity, good job
2 votes ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago
Thanks :)
0 votes ● Reply ● Message ● Permalink

Sankalp Chugh 4 years ago
I didn't understand the graph. Can anyone explain?
1 vote ● Reply ● Message ● Permalink

Dinesh Saini 4 years ago

Graph clearly shows the relationship between number of elements and number of operations required to perform search.

▲ 1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Hope you understood what dinesh explained.
Thanks Dinesh :)

▲ 0 votes ● Reply ● Message ● Permalink

Ashu Khanna 4 years ago

Nice compilation !! :)

▲ 1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Thanks :)

▲ 0 votes ● Reply ● Message ● Permalink

Ankit Gaurav 4 years ago

Good one. Thanks. Saved my time.

▲ 1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Welcome :)

▲ 0 votes ● Reply ● Message ● Permalink

Durwasa Chakraborty 4 years ago

No sorting algorithm in the world can have a complexity of the order of N. Shell sort's best case time complexity is O(nlogn). Please make the necessary corrections. :) :)

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Vipin Khushu Author 3 years ago

Correction Text Added. Thanks for pointing the error

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Chaitanya Sudhir Deshpande 4 years ago

nice work.!!

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Vipin Khushu Author 3 years ago

Thanks :)

▲ 0 votes ● Reply ● Message ● Permalink

Mani Kanth 4 years ago

how to know this complexities can anybody help me?

▲ 1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Read about time complexities.
Study these algorithms.
Then analyse time complexities for them.

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Suresh Kumar Prajapati 4 years ago

what a technique to memorise complexity.....

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Hope you gained something from this note. Thanks :)

0 votes ● Reply ● Message ● Permalink

harsh jain 4 years ago

it's necessary to remember for interview :P

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Yeah! One of the important topics

0 votes ● Reply ● Message ● Permalink

Bhimashankar sutar 3 years ago

Very helpfull.....!

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Yeah!

0 votes ● Reply ● Message ● Permalink

Kapil Khandelwal 3 years ago

A good, organised table easy to remember.
Very helpful stuff....

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

Thanks!

0 votes ● Reply ● Message ● Permalink

Reddy Surekha 3 years ago

please give clear explanation of above graph

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

https://www.hackerearth.com/practice/notes/sorting-and-searching-algorithms-time-complexities-cheat-sheet/?scroll-id=comments-320-669&scroll-trigger=inview#c42226

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Vishal Vedula 3 years ago

Thanks :)

1 vote ● Reply ● Message ● Permalink

Vipin Khushu Author 3 years ago

:)

0 votes ● Reply ● Message ● Permalink

Bhimashankar sutar 2 years ago

Thanks for sharing this...

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Akshay Gahoi a year ago

Above table is a blunder. It is to be noted that only the worst-case complexities are represented by the Big-O notation, whereas, for best and average case complexities, Ω and Θ notations are used respectively. Please update the table accordingly.

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Kashish Garg 3 years ago

auxiliary space complexity of heapsort is O(1) not O(n) and if you are not talking about auxiliary space then all space complexities are O(n).

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Ajay Verma 3 years ago

memoization :-)

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Rakeshkumar Taninki 2 years ago

thank u

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Amit Hegde a year ago

http://bigocheatsheet.com/

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AUTHOR

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Faridabad, Haryana, India

1 note

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