← Notes

Sorting And Searching Algorithms - Time Complexities Cheat Sheet

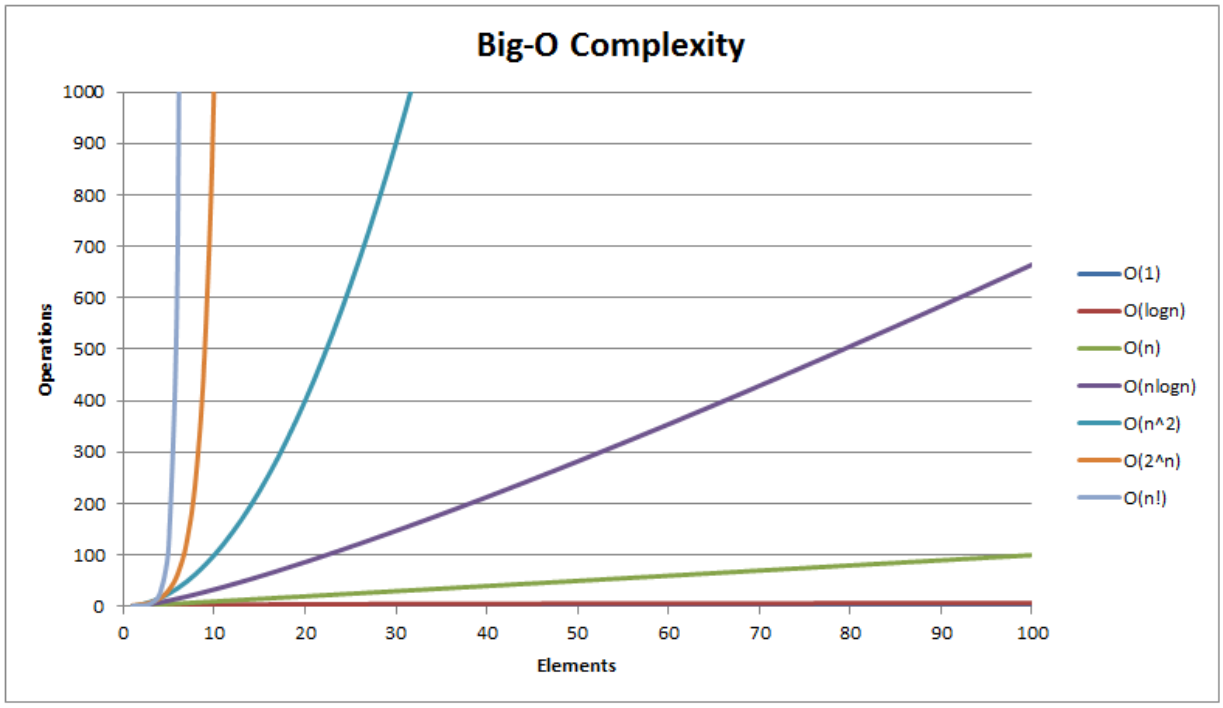
195

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 (42) SORT BY: Relevance

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sumit kumar 7 years ago
very usefull for exam time.....!!!!
1 vote

Virender Kumar 7 years ago
usefull all time not only exam :P
4 votes

Vipin Khushu Author 6 years ago
Thanks, All the best :)
0 votes

Sameer Gupta 7 years ago
Very nice way to memorise complexity, good job
2 votes

Vipin Khushu Author 6 years ago
Thanks :)
0 votes

Sankalp Chugh 7 years ago
I didn't understand the graph. Can anyone explain?
1 vote

Dinesh Saini 7 years ago
Graph clearly shows the relationship between number of elements and number of operations required to perform search.

1 vote

Vipin Khushu Author 6 years ago

Hope you understood what dinesh explained.
Thanks Dinesh :)

0 votes

Durwasa Chakraborty 7 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. :) :)

2 votes

Vipin Khushu Author 6 years ago

Correction Text Added. Thanks for pointing the error

0 votes

Raghav Rastogi a year ago

what about counting sort

0 votes

Ashu Khanna 7 years ago

Nice compilation !! :)

1 vote

Vipin Khushu Author 6 years ago

Thanks :)

0 votes

Ankit Gaurav 7 years ago

Good one. Thanks. Saved my time.

1 vote

Vipin Khushu Author 6 years ago

Welcome :)

0 votes

Chaitanya Sudhir Deshpande 7 years ago

nice work.!!

1 vote

Vipin Khushu Author 6 years ago

Thanks :)

0 votes

Mani Kanth 7 years ago

how to know this complexities can anybody help me?

1 vote

Vipin Khushu Author 6 years ago

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

0 votes

Suresh Kumar Prajapati 7 years ago

what a technique to memorise complexity.....

1 vote

Vipin Khushu Author 6 years ago

Hope you gained something from this note. Thanks :)

0 votes

Harsh Jain 7 years ago

it's necessary to remember for interview :P

1 vote

Vipin Khushu Author 6 years ago

Yeah! One of the important topics

0 votes

Bhimashankar sutar 7 years ago

Very helpfull.....!

1 vote

Vipin Khushu Author 6 years ago

Yeah!

0 votes

Kapil B Khandelwal 6 years ago

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

1 vote

Vipin Khushu Author 6 years ago

Thanks!

0 votes

Reddy Surekha 6 years ago

please give clear explanation of above graph

1 vote

Vipin Khushu Author 6 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

0 votes

Vishal Vedula 6 years ago

Thanks :)

1 vote

Vipin Khushu Author 6 years ago

:)

0 votes

Bhimashankar sutar 5 years ago

Thanks for sharing this...

1 vote

Akshay Gahoi 4 years 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.

1 vote

Kashish Garg 6 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).

0 votes

Ajay Verma 6 years ago

memoization :-)
0 votes

Rakeshkumar Taninki 5 years ago
thank u
0 votes

Amit Hegde 4 years ago
http://bigocheatsheet.com/
0 votes

Swithika Mutyam 2 years ago
thank you so much!
very helpful.
0 votes

Kirithika S 2 years ago
This was helpful for my tech interview prep, thank you Vipin.
0 votes

Sriashika Addala Edited 2 years ago
Hey in the complexity comparison graph, I guess O(1) should be a horizontal line with no of Operations=1 for all values of num of elements!? Also the logn graph..
Please refer to this image for reference: https://images.app.goo.gl/ERgp7w9e7Ljdxiju9
0 votes

Christina Shah 2 years ago
This is very helpful. Thank you bhaiya. :)
0 votes

Uzmi Kafil a year ago
The symbol representation of Best Case (Omega), Average case(Theta) and Worst case (Big O) should have been used in the above table.
0 votes

AUTHOR

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Software Development Eng...
Noida Delhi NCR
1 note

TRENDING NOTES

Python Diaries Chapter 3 Map | Filter | For-else | List Comprehension
written by Divyanshu Bansal

Bokeh | Interactive Visualization Library | Use Graph with Django Template
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Bokeh | Interactive Visualization Library | Graph Plotting
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Python Diaries chapter 2
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Python Diaries chapter 1
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