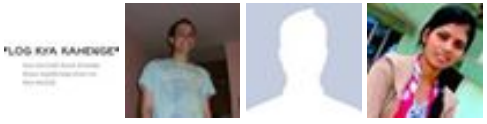
When does the worst case of Quicksort occur?

The answer depends on strategy for choosing pivot. In early versions of Quick Sort where leftmost (or rightmost) element is chosen as pivot, the worst occurs in following cases.

1) Array is already sorted in same order.
2) Array is already sorted in reverse order.
3) All elements are same (special case of case 1 and 2)

Since these cases are very common use cases, the problem was easily solved by choosing either a random index for the pivot, choosing the middle index of the partition or (especially for longer partitions) choosing the median of the first, middle and last element of the partition for the pivot. With these modifications, the worst case of Quick sort has less chances to occur, but worst case can still occur if the input array is such that the maximum (or minimum) element is always chosen as pivot.

References:
http://en.wikipedia.org/wiki/Quicksort



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groomnestle • 5 months ago

The worst case occurs if the chosen pivot happens to be the largest or smalle

So in early implementation which picks first element as pivot worse case woul

In practice this is a very unlikely situation as pivot is chosen randomly or from

1 ^ | v •

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Rajesh • 2 years ago

explain output of merge sort in each pass but it is recursive in nature?

```
/* Paste your code here (You may delete these lines if not writing co
```

1 ^ | v •

Himanshu • 3 years ago

Any idea on how the C standard library or C++ standard library prevents these
Does the qsort() implementation in C/C++ standard library also suffers from C
pathological cases?

^ | v •

kartik ➚ Himanshu • 3 years ago

@Himanshu: I am not sure how standard C++ library prevents worst c
though which we can guarantee that worst case would never occur.

We can find median of array in O(n) time using order statics algorithm
use median as pivot. It will be an ideal pivot dividing the array in two hal
occurs and time complexity remains O(nLogn) for all inputs. Finding m
complexity as finding median is O(n) which is same as partition. But, tl
slow and not followed.

^ | v •

neha2210 ➚ kartik • a year ago

But if median is found in O(n) time, time complexity also depen
median.
Am I right?

^ | v •

bharath reddy ➦ neha2210 • 8 months ago

But the number of steps is O(logn); so that won't chang

3 ^ | v •

joh • 3 years ago

Could you give an example as why?

^ | v •

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