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	Duick Sort Malyria
	- mayay
)	Time Complexity.
	-> Worst - Coye: The worst - case in a
	quickgast almostly
	quickgont algorithm happens when our
	attray is abready sorted.
	2 · 3 / (4 = (1 · 1 · 1 · 1 · 1 · 1 · 1 · 1 · 1 · 1
	1 2 4 8 12 PARTETION -> 1
	US : / 4907 39
	0 1 2 3 4
	2 4 8 12 " -> 2
(H) M	STATE TOP INT THE DEST LEADING TO THE
· patit	and copie toold to restore 112 instantinostrano sur
diverige	2 54 0 10
STEP &	110 110 110 110 110 110 110 110 110 110
:(1	
	** to orday 2 4 509 8 12 500 -> 4
	7 12 12 12 12 12 12 12 12 12 12 12 12 12
- Carlina	1 2 4 8 12
	1124812
	JOR?ED
-	
	Do, if we calculate, for an array of
	4ing 5 110 look to berition 10 1
	gize 5, we had to partition the substray
	4 times. That is, for an arrivay of size n.
	there would be (n-1) partitions. Now,
	during each positions, we made our
	treo index variables, i & j and trung from
	either direction towards each other
	with with

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1973	each other. And we do some
	blu as well. There shorteting in
	linear function of m, contributing O(n) to
	the truntinge complexity.
	And gince there are a total of (n-1)
	(Instruction)
	is our Hort worst - case complexity.
No. 1	to the transfer of the same of
n)	-) BEJP-CME: The condition when own algorithm
41.0.10	performs in its left populate time complexity
	is when our attray gets airided into two
that!	almost equal subarrays at each partition.
Ixi(n)	
2×7(m)	The state of the s
1	and the state of t
22 x 3(m)	
/2	
TI	12 pt 1 state of the state of t
	Ho.
	Here, T(x) is the time taken during the
	partition of the arrian with a elements. And as we know, the partition talkey a
	Ifra as we know, we

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	to be equal to x; hence the total time
- Spanie	Complexity becomes,
- 5	palling that I to the the
	Total time = 1(n) + 2(n/2) + 4(n/4) + + until the height of the true (h)
	+ until the height of the true (h)
(Same of a	the state of the s
A Andrews	Total time = nxh
ian.	- How II is the height of the tree, and
militian	the height of the tree, it is log in),
	where n is the size of the given array.
	In the above example, h=4, since
	log 2 (16) equals 4. Hence the time complexity
-J-T	of the algorithm in its best case is
	-0(nlogh). 111111111111111111111111111111111111
9 1	Stability: The Quik fort algorithm is not
117	stable . It does greats of all kinds
	and hence loses its stability.
15	2 8 9 12 2
11	2891122
	And the last obotto
44	When we apply the partition on the above organ with the first element as the
	attrag with the way evening
	pivot, our averag becomes.
scit +	1 2 19 12 8+ 15 miles
Nor300	13 W Land Franch Land
it in	- Salttra Later - 1

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And the two 2s get their order reverged. Hence quick sort is not stable.

3) Duicksport algorithm is an in-place algorithm. It doesn't consume any extra space in the memory. It does all kinds of operations in the same overay itself.

There is no have and past trule to change only the first element as the pivot; nother, you can have any transform element as its pivot using the transl) function and that you wouldn't believe actually treduces the algorithm. I complexity.