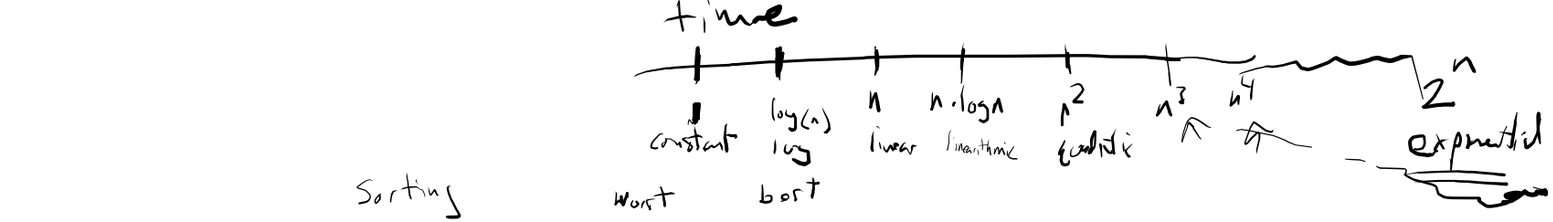
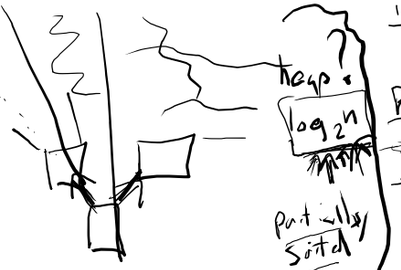


Sorting

	Worst	best
selectionSort (find min and for each spot)	n^2	n^2
insertionSort (add at end, push down until it reaches it)	n^2	n
Bubble Sort (compare from left → right, swap if needed; repeat if any swaps)	n^2	n
HeapSort (add to heap for each element)	$n \cdot \log_2(n)$	$n \cdot \log_2(n)$
MergeSort	$n \cdot \log_2 n$	$n \cdot \log_2(n)$



$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{16}$

MergeSort (list)
sf = MergeSort (1st half of list)
sn = MergeSort (2nd half of list)
return merge (sf, sn)

Base case: if len(list) == 1: return

RECURSION

merge (sf, sn)
for number of total items
Compare first of sf w first of sn
remove smaller + add to growing sorted list

n

$\log_2 n$

$\log_2 64$

64

32 32

16 16 16 16

8 8 8 8 8 8 8 8

4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4

2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Asymptotic Behavior

$$\frac{3n^2 - 5n + 17}{25} \rightarrow n^2$$

$+ n^3$

$3 \cdot (n \log_2(N+4))$

More Space

QuickSort?