

Cmp 338

9:109

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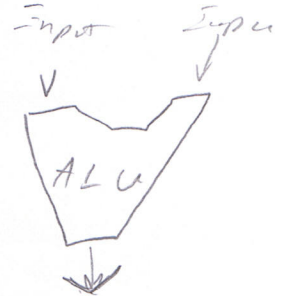
Date Abstracts 2 pages Schwartz w/ Jan  
ISBN: 0-321-3428-4 new  
" 0-321-19717-8 old

Stacks & Queues  
Linked Lists  
Binary Search Trees  
Heaps  
Graphs

Complexity

running  
program  
in a reasonable  
time

Code



Bubble Sort

Comparison count / List size is  $n$



$n-1$  comparisons go through the list one time.



Need to go through the list  $n-1$  times.

$$2^{10} = 1024$$

$$\approx 1,000,000 = 2^{20}$$

$$1000 = 10^3$$

Comparison count  
 $(n-1)(n-1)$

So  
 $= n^2 - 2n + 1$

Merge Sort

$$n \cdot \log n$$

$$n^2 - 2n - 1$$

$$10^2 - 2(10) - 1$$

$$100^2 - 20 + 1$$

7

$$1000 - 200 + 1$$

$$1000^2 - 2(1000) + 1$$

4

$$1000,000 - 2000 + 1$$

$$(109)^2 - 2(109) + 1$$

$$10^{18-2} \times 10^9 + 1$$

1000, 600, 600, 600, 600, 600  
200, 200, 200

Bubble Sort

$$\frac{10^8 \text{ comparisons}}{10^9 \text{ comparisons/sec}} = 10^9 \text{ sec}$$

$$\text{Se } \frac{10^9 \text{ sees}}{100} = 10^7 \text{ m}$$

$$\frac{10^7 \text{ m/s}}{100} = 10^5 \text{ hours}$$

$$\frac{10^5 \text{ hours}}{100} = 10^3 \text{ days}$$

$4 \cdot 10^3$  days

Merge Sort

$$\frac{3 \times 10^{10} \text{ copies}}{10^8 \text{ Sec}} = 3 \times 10^2 \text{ Sec} = 300 \text{ Sec}$$

$$= 300 \text{ Sec}$$

$$\frac{300}{60} \text{ Sec}$$

5 min

test	2 test	test 1	Final
1	Stacks & Queues		
2	Linked Lists		
3	Binary search trees		
4	Heaps		
5	Graphs		

Sample questions on web site