EECS268
Lab7 Writeup
Christopher Watkins
3/24/17

Questions

1. Plot your data in a spreadsheet with time in seconds on the y-axis and the size of n on the x-axis (plots should be in the pdf you turn). Make sure the sorts are clearly labeled.

(Data and graphs can be found on next page)

2. Do the sorts we know to be of O(n^2) complexity demonstrate this behavior? (The iterative sorts)

Yes; selection, bubble, and insertion sort all display the behavior associated with O(n^2) complexity. As shown in the graph it is obvious how inefficient these algorithms get compared to the recursive sorts when values for n get very large.

3. Do the sorts we know to be of O(n*lg(n)) complexity demonstrate this behavior? (The recursive sorts)

Yes; merge, quick and quickWithMedian sorts all demonstrate behavior associated with O(n*log(n)) behavior. This sorting algorithms continued to be very efficient even for the large n values when compared to the iterative sorts.

4. For any plot points that are outliers (far away from the rest of the curve), how do you explain them?

Outliers in my graph can most likely be attributed to the parralell tasks my processor was completing in addition to the sorting algorithm. There was much fluctuation in the lower values of n which can be seen in the graph of the iterative sorts and this can also be imputed to all of the additional varying tasks being completed between and during each iteration of the sort. Overall, however, the behavior emerges for each sort just as we would expect.

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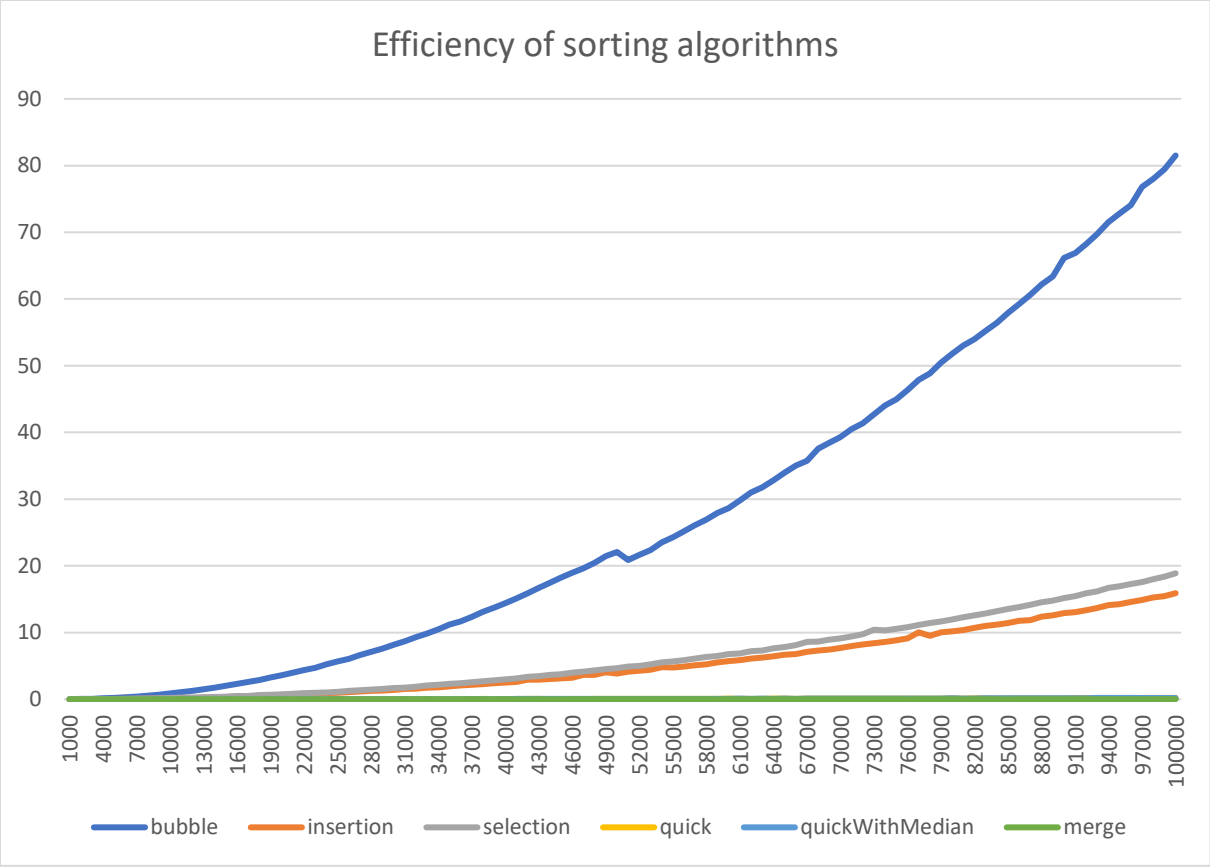

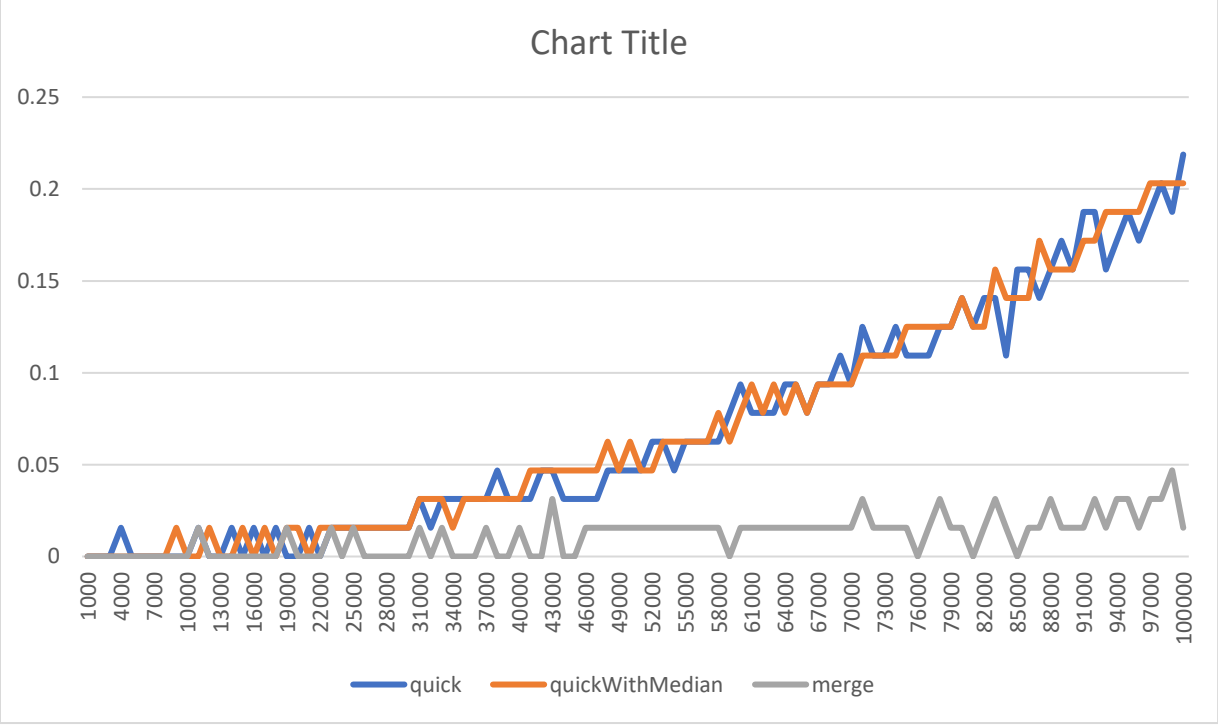

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n	bubble	insertion	selection	quick	quickWithMedian	merge
1000	0.015625	0.015625	0.015625	0	0	0
2000	0.046875	0	0	0	0	0
3000	0.0625	0.015625	0.015625	0	0	0
4000	0.140625	0.015625	0.03125	0.015625	0	0
5000	0.1875	0.046875	0.03125	0	0	0
6000	0.3125	0.0625	0.078125	0	0	0
7000	0.421875	0.078125	0.09375	0	0	0
8000	0.5625	0.09375	0.125	0	0	0
9000	0.703125	0.125	0.15625	0	0.015625	0
10000	0.890625	0.15625	0.1875	0	0	0
11000	1.0625	0.203125	0.234375	0.015625	0	0.015625
12000	1.28125	0.21875	0.265625	0	0.015625	0
13000	1.515625	0.25	0.3125	0	0	0
14000	1.734375	0.3125	0.375	0.015625	0	0
15000	2.046875	0.359375	0.421875	0	0.015625	0
16000	2.296875	0.40625	0.5	0.015625	0	0
17000	2.609375	0.453125	0.515625	0	0.015625	0
18000	2.875	0.53125	0.640625	0.015625	0	0
19000	3.296875	0.59375	0.671875	0	0.015625	0.015625
20000	3.625	0.671875	0.734375	0	0.015625	0
21000	4	0.71875	0.84375	0.015625	0	0
22000	4.40625	0.75	0.90625	0	0.015625	0
23000	4.734375	0.90625	1	0.015625	0.015625	0.015625
24000	5.265625	0.921875	1.046875	0.015625	0.015625	0
25000	5.671875	1	1.125	0.015625	0.015625	0.015625

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26000	6.046875	1.078125	1.25	0.015625	0.015625	0
27000	6.640625	1.15625	1.375	0.015625	0.015625	0
28000	7.09375	1.25	1.46875	0.015625	0.015625	0
29000	7.609375	1.328125	1.5625	0.015625	0.015625	0
30000	8.171875	1.421875	1.703125	0.015625	0.015625	0
31000	8.703125	1.5625	1.765625	0.03125	0.03125	0.015625
32000	9.3125	1.59375	1.90625	0.015625	0.03125	0
33000	9.875	1.734375	2.078125	0.03125	0.03125	0.015625
34000	10.46875	1.796875	2.171875	0.03125	0.015625	0
35000	11.17188	1.953125	2.296875	0.03125	0.03125	0
36000	11.67188	2.0625	2.421875	0.03125	0.03125	0
37000	12.32813	2.15625	2.578125	0.03125	0.03125	0.015625
38000	13.125	2.28125	2.6875	0.046875	0.03125	0
39000	13.71875	2.421875	2.84375	0.03125	0.03125	0
40000	14.39063	2.53125	2.96875	0.03125	0.03125	0.015625
41000	15.14063	2.625	3.15625	0.03125	0.046875	0
42000	15.875	2.921875	3.375	0.046875	0.046875	0
43000	16.6875	2.921875	3.453125	0.046875	0.046875	0.03125
44000	17.48438	3.03125	3.640625	0.03125	0.046875	0
45000	18.26563	3.15625	3.75	0.03125	0.046875	0
46000	18.98438	3.25	4	0.03125	0.046875	0.015625
47000	19.65625	3.640625	4.140625	0.03125	0.046875	0.015625
48000	20.46875	3.671875	4.34375	0.046875	0.0625	0.015625
49000	21.4375	4.03125	4.515625	0.046875	0.046875	0.015625
50000	22.0625	3.875	4.65625	0.046875	0.0625	0.015625
51000	20.90625	4.125	4.90625	0.046875	0.046875	0.015625

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52000	21.67188	4.296875	5	0.0625	0.046875	0.015625
53000	22.375	4.4375	5.25	0.0625	0.0625	0.015625
54000	23.5	4.796875	5.515625	0.046875	0.0625	0.015625
55000	24.26563	4.75	5.65625	0.0625	0.0625	0.015625
56000	25.21875	4.90625	5.890625	0.0625	0.0625	0.015625
57000	26.09375	5.125	6.09375	0.0625	0.0625	0.015625
58000	26.92188	5.234375	6.328125	0.0625	0.078125	0.015625
59000	27.92188	5.515625	6.484375	0.078125	0.0625	0
60000	28.67188	5.71875	6.796875	0.09375	0.078125	0.015625
61000	29.79688	5.875	6.875	0.078125	0.09375	0.015625
62000	30.98438	6.125	7.234375	0.078125	0.078125	0.015625
63000	31.78125	6.265625	7.3125	0.078125	0.09375	0.015625
64000	32.84375	6.46875	7.625	0.09375	0.078125	0.015625
65000	33.98438	6.6875	7.84375	0.09375	0.09375	0.015625
66000	35.04688	6.796875	8.125	0.078125	0.078125	0.015625
67000	35.76563	7.09375	8.625	0.09375	0.09375	0.015625
68000	37.5625	7.328125	8.671875	0.09375	0.09375	0.015625
69000	38.42188	7.453125	8.921875	0.109375	0.09375	0.015625
70000	39.29688	7.6875	9.140625	0.09375	0.09375	0.015625
71000	40.48438	7.96875	9.421875	0.125	0.109375	0.03125
72000	41.375	8.234375	9.75	0.109375	0.109375	0.015625
73000	42.70313	8.40625	10.42188	0.109375	0.109375	0.015625
74000	44.03125	8.609375	10.34375	0.125	0.109375	0.015625
75000	44.96875	8.84375	10.54688	0.109375	0.125	0.015625
76000	46.35938	9.109375	10.79688	0.109375	0.125	0
77000	47.89063	10.0625	11.14063	0.109375	0.125	0.015625

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78000	48.84375	9.53125	11.42188	0.125	0.125	0.03125
79000	50.5	10.0625	11.65625	0.125	0.125	0.015625
80000	51.75	10.20313	11.95313	0.140625	0.140625	0.015625
81000	53.03125	10.35938	12.28125	0.125	0.125	0
82000	53.98438	10.73438	12.57813	0.140625	0.125	0.015625
83000	55.23438	11	12.89063	0.140625	0.15625	0.03125
84000	56.4375	11.17188	13.20313	0.109375	0.140625	0.015625
85000	57.92188	11.4375	13.5625	0.15625	0.140625	0
86000	59.26563	11.78125	13.84375	0.15625	0.140625	0.015625
87000	60.64063	11.84375	14.17188	0.140625	0.171875	0.015625
88000	62.17188	12.39063	14.5625	0.15625	0.15625	0.03125
89000	63.375	12.5625	14.8125	0.171875	0.15625	0.015625
90000	66.15625	12.90625	15.15625	0.15625	0.15625	0.015625
91000	66.89063	13.0625	15.48438	0.1875	0.171875	0.015625
92000	68.23438	13.35938	15.89063	0.1875	0.171875	0.03125
93000	69.75	13.6875	16.20313	0.15625	0.1875	0.015625
94000	71.53125	14.10938	16.6875	0.171875	0.1875	0.03125
95000	72.84375	14.28125	16.9375	0.1875	0.1875	0.03125
96000	74.0625	14.59375	17.26563	0.171875	0.1875	0.015625
97000	76.82813	14.90625	17.5625	0.1875	0.203125	0.03125
98000	78.03125	15.26563	18	0.203125	0.203125	0.03125
99000	79.45313	15.48438	18.39063	0.1875	0.203125	0.046875
100000	81.51563	15.90625	18.89063	0.21875	0.203125	0.015625