CS3 Homework 8

Part I

sortA sortB sortC

20000 0.003768 0.657804 0.040008

40000 0.005370 2.642657 0.127957

80000 0.011426 10.622273 0.512392

160000 0.022459 42.263346 2.076251

320000 0.034880 168.427013 8.594630

640000 0.061177 673.455802 34.946623

Big-O O(n) O(n2) O(n2)

Hand in/email:

* + BigORandom.java (class BigORandom has only 1 method, main)

Part II

sortA sortB sortC

20000 0.002553 0.054605 0.000520

40000 0.003716 0.194387 0.001064

80000 0.009974 0.769882 0.002014

160000 0.017406 3.233915 0.003643

320000 0.022090 12.905657 0.003393

640000 0.031209 52.197703 0.006107

1280000 0.043404 235.810011 0.007329

Big-O O(n) O(n2) O(n)

Hand in/email:

* + BigOAscending.java (class BigOAscending has only 1 method, main)

Part III

If a sorting algorithm is quadratic, explain whether it should be insertionSort, selectionSort, or bubbleSort and why. If it is not quadratic, no comment is necessary.

SortA is not quadratic so it can't be any of the three. SortC would have to be insertionSort since it is the only one of the three that we talked about that has a best case of O(n) while still having a worst or average case of O(n2). For sortB it could be either bubbleSort or selectionSort but since it is so bad time wise, I would have to assume it would be bubbleSort.

Note:

* These 3 parts are all equal in points. So give your reasoning for Part III with some thoughts.