Algorithms Practical 4

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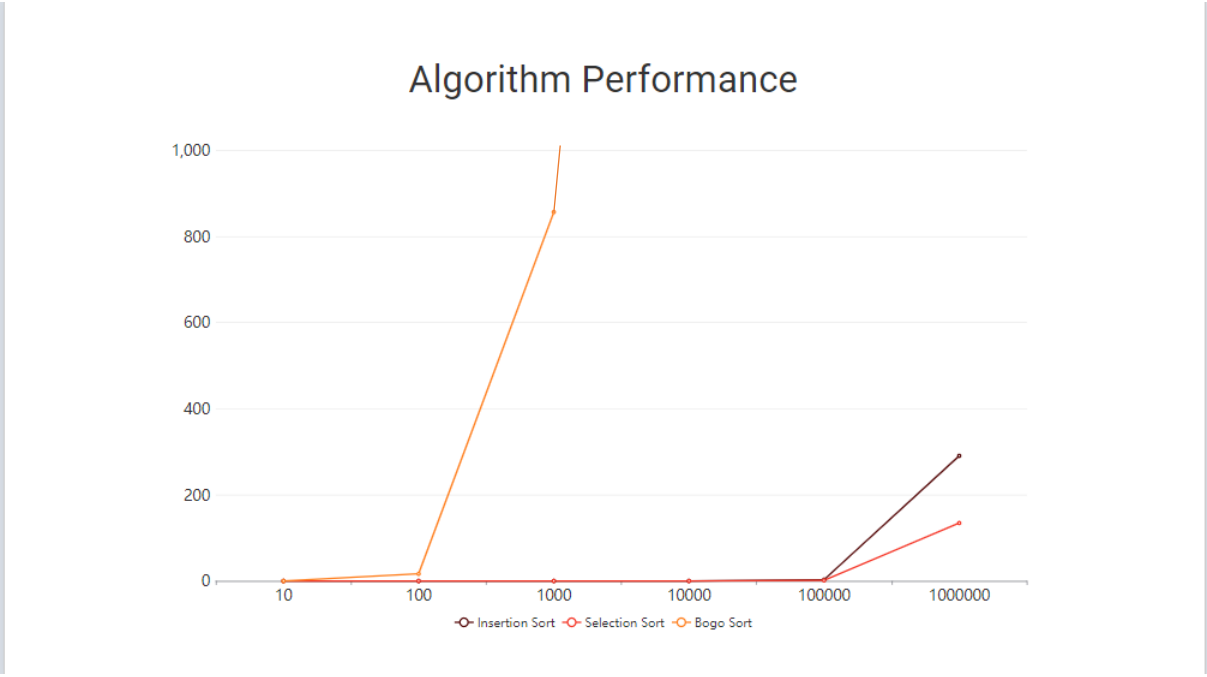
Short Questions

1. Linear
2. A Stable sorting algorithm preserve the existing relative order of elements when comparing equal keys.
3. A
4. 1. Comparison vs non-comparison
   2. Time Complexity
   3. Space Complexity
   4. Stability
   5. Internal vs External
   6. Recursive vs non-recursive

Sorting Algorithms

The Silly Sort I implemented was the Bogo Sort algorithm.

Sorting Algorithm	10	100	1000	10000	100000	1000000
Insertion Sort	0.0	0.002	0.007	0.07	3.075	290.468
Selection Sort	0.0	0.001	0.007	0.053	1.557	134.466
Bogo Sort	0.02	16.5	856	n/a	n/a	n/a



From the results seen on the graph and the table above, Selection Sort appears to have the best performing algorithm with Insertion Sort coming closely behind. This appears to contradict many results when I checked which algorithm was more efficient online this may be due to some sets of

the randomly generated data were partially solved. From examining both of these algorithms they both seem to have a general algorithm complexity of O(n^2) as the larger the size of the array the time to sort it appears to follow n^2. As you can see with the Bogo sort it is extremely inefficient as it took more than 20 mins when n was 10000 and I decided to stop. It appears to follow the algorithm complexity of O(n n!) from the graph.