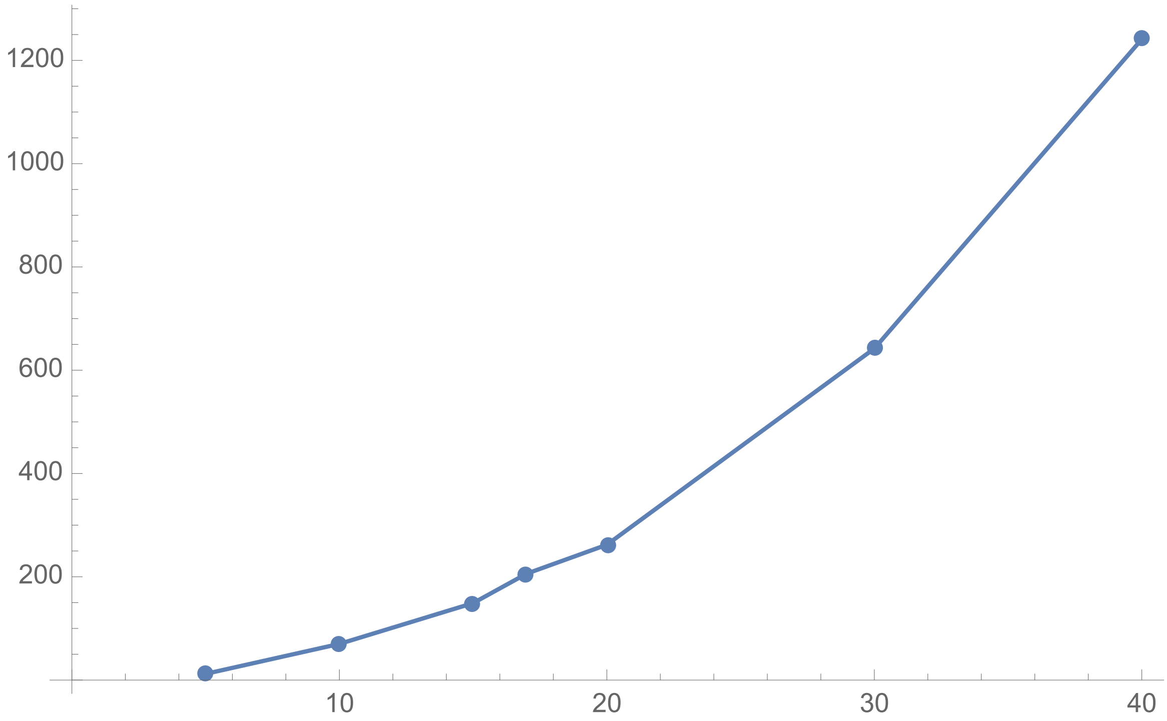
Tianyi Ma

bubble sort

{size, runtime/times} = {5, 12}, {10, 70}, {15, 149}, {17, 206}, {20, 262}, {30, 642}, {40, 1241}

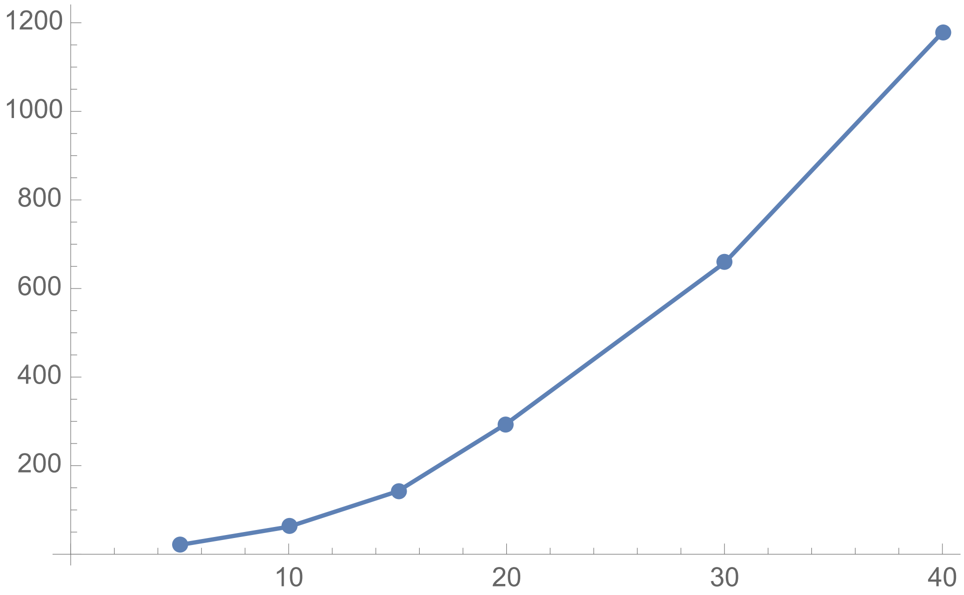
Analysis: the runtime in experiment is approximately O(n^2), corresponding with the expected average case O(n^2).



insertion sort

{size, runtime/times} = {5, 21}, {10, 62}, {15, 142}, {20, 295}, {30, 658}, {40, 1178}

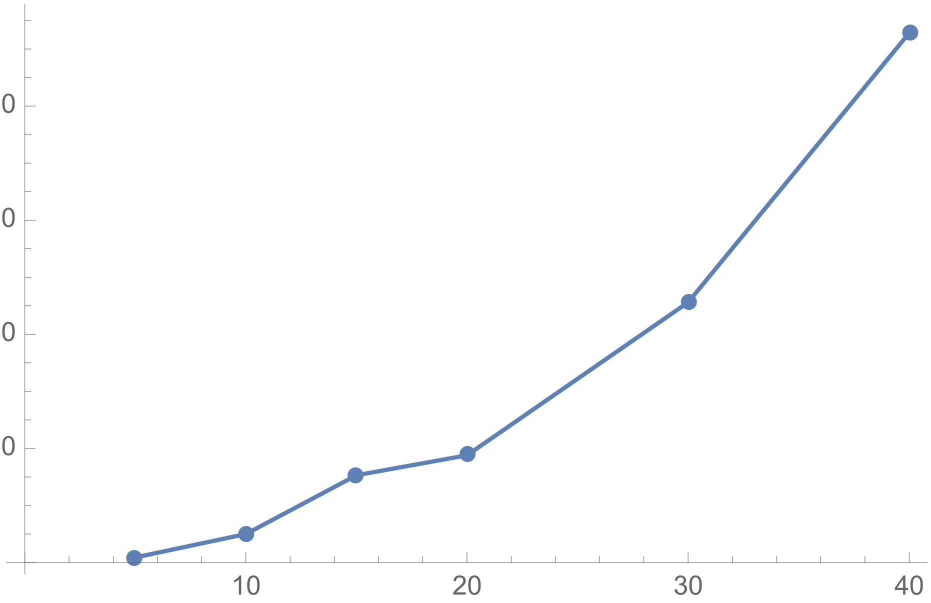
Analysis: the runtime in experiment is approximately O(n^2), corresponding with the expected average case O(n^2).



shell sort

{size, runtime/times} = {5, 9}, {10, 50}, {15, 153}, {20, 188}, {30, 456}, {40, 928}

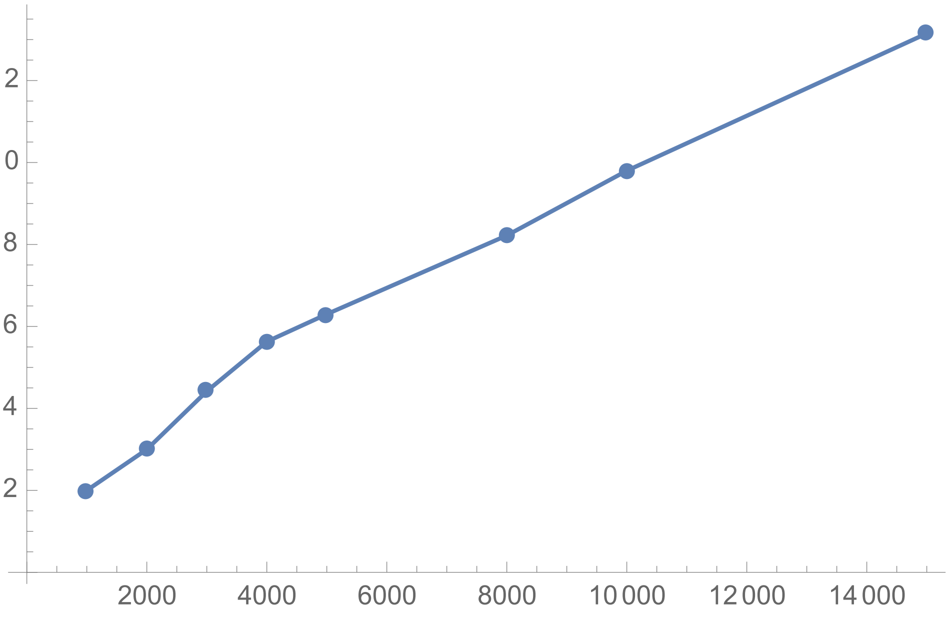
<u>Analysis:</u> the runtime in experiment is approximately O(n^1.5), corresponding with the expected average case O(n^1.5). Notice that the runtime of the shell sort is apparently shorter than the previous two sort methods (y-axis only have the range 0-800, while the previous two have 0-1200).



sort()

{size, runtime/millesec} = {1000, 2}, {2000, 3}, {3000, 4.42}, {4000, 5.63}, {5000, 6.3}, {8000, 8.22}, {10000, 9.8}, {15000, 13.15}

<u>Analysis:</u> the runtime in experiment is approximately O(n*logn), corresponding with the expected average case of quick sort.


12
10
8
6
4
2
2000
4000
6000
8000
10 000
12 000
14 000