|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Sorting Algorithms – Visualization & Growth (part II)** |  |

One submission per team in lab 6 google form. Include team member names.

Download <http://www.cs.iit.edu/~cs100/IITSort.zip> (windows only install on your own laptop), unzip and install the windows application IITSort. You are going to be checking your predictions from last week. Watch this short video on how to use IITSort <http://www.cs.iit.edu/~cs100/CS100_IITSort_Demo.mp4>

View – Sort Settings – Order(random), Height(500), Width(50)

File – New – (choose a sort and click OK)

Sort – Start

1. Run the 3 sorts (Bubble Sort, Selection Sort, Merge Sort) on 50 items. For each of the sorts compare your prediction from lecture last week of what the list would look like when the sort is part way done. Discuss any differences here.

2. From lecture last week, fill in your predicted number of comparisons needed to sort 10 items, and your growth prediction (2 times or 4 times). Then run each one of the sorts on increasing numbers of items and record the comparison counts.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Estimated 10 item comparison count from lecture last week | Predicted growth increase for 20 items (2 times or 4 times) | Width (50) | Width (100) | Width (500) |
| Bubble Sort |  |  |  |  |  |
| Selection Sort |  |  |  |  |  |

3. Does the growth in the actual comparison counts match your predicted growth increase? Discuss any differences here.

4. From lecture last week, fill in your prediction (higher or lower) for the number of comparisons needed to sort items with Merge Sort as compared to the other sorts. Also fill in your prediction for Merge Sort growth (higher growth or lower growth). Then run Merge Sort on increasing numbers of items and record the comparison counts.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Estimated 10 item comparison count from lecture last week (higher or lower) | Predicted **growth** increase  (higher growth or lower growth) | Width (50) | Width (100) | Width (500) |
| Merge Sort |  |  |  |  |  |

5. Does the growth in the actual comparison counts match your predicted growth increase? Discuss any differences here.

6. Now run Bubble Sort twice more on 50 items, once with “Almost Ascending” initial list and once with “Almost Descending” initial list (see in View – Sort Settings). Comment on this effected the comparison counts as compared with the random list you sorted before.