EECS 560

Lab09

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| --- | --- | --- | --- | --- | --- |
| Performance(bst): | | | | | |
|  | 1,000,000 | 2,000,000 | 3,000,000 | 4,000,000 | 5,000,000 |
| Build | 1.28054 | 3.20463 | 5.44003 | 7.82867 | 10.3173 |
| DeleteMin | 0.000305 | 0.0006628 | 0.0010524 | 0.0014078 | 0.0017718 |
| DeleteMax | 0.0003114 | 0.000682 | 0.0010762 | 0.0014666 | 0.001864 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Performance(Min-5 Heap): | | | | | |
|  | 1,000,000 | 2,000,000 | 3,000,000 | 4,000,000 | 5,000,000 |
| Build | 0.0674614 | 0.105445 | 0.158894 | 0.213151 | 0.268575 |
| DeleteMin | 0.0010036 | 0.0018758 | 0.0029074 | 0.0040536 | 0.0052786 |
| DeleteMax | 6.63185 | 26.2479 | 58.9475 | 105.888 | 166.347 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Performance(Max-5 Heap): | | | | | |
|  | 1,000,000 | 2,000,000 | 3,000,000 | 4,000,000 | 5,000,000 |
| Build | 0.0700402 | 0.125383 | 0.156376 | 0.209691 | 0.263253 |
| DeleteMin | 6.57774 | 26.0976 | 58.8029 | 105.594 | 167.015 |
| DeleteMax | 0.000979 | 0.0019072 | 0.002938 | 0.0043924 | 0.0056584 |

1. Binary Search Tree spend the longest time on building a tree. Min-5 heap and Max-5 heap spend almost the same time on building a heap and they are more efficient than Binary Search Tree on building the data.
2. Comparing the two deletion methods, binary search tree is more efficient than two heaps.
3. Comparing Max-5 heap and Min-5 heap, Min-5 heap is more efficient on DeleteMin but waste the longest time on DeleteMax. Max-5 heap is more efficient on DeleteMax but waste the longest time on DeleteMin.
4. Time of DeleteMin for Max-5 heap is almost the same as the DeleteMax for Min-5 heap. Time of DeleteMax for Max-5 heap is almost the same as the DeleteMin for Min-5 heap.