

CSSE 230, Spring 2024/25, Comparative Evaluation of Key Data-structures

Category	BST	AVL	AA	Skiplist
Worst-case insert/remove	N	log(N)	log(N)	N
Best-case insert/remove	1	log(N)	log(N)	1
Average-case insert/remove	TBA	log(N)	log(N)	TBA
Max # rotations on insert	N/A	1	h*2	N/A
Max # rotations on remove	N/A	h/2	h	N/A
Lopsidedness <sup>1)</sup>	1:N	1:2	1:2	N/A
Avg. # rotations on insert	N/A	702,587	1,717,525	N/A
Avg. # rotations on removal	N/A	381,119	1,057,053	N/A
Height of 2 Mio	312	24	28	N/A
Potential <sup>3)</sup> of 2 Mio	28.28	20.36	20.79	N/A
Inserting 1 Mio Into 1 Mio	582	882	874	1953
Removing 1 Mio in 2 Mio	702	963	1499	1896
Finding 1 Mio in 2 Mio	551	541	558	
Finding w/ Hash Table	155	164	163	168
Iterator <sup>4)</sup>	2524	2846	2716	304

<sup>1</sup> Largest ratio of longest path length to a null node to shortest path length to a null node.

<sup>3</sup> Average number of nodes visited from root to any of the nodes.

<sup>4</sup> Creating an iterator 1 Mio times in a 2 Mio tree returning first 5-100 elements. Number of elements determined at random.

NOTICE: All data was generated with all apps closed, except for Eclipse.