

AVL Runtime Proof

On Friday, we proved an upper-bound on the height of an AVL tree is $2 \times \lg(n)$ or $O(\lg(n))$:

$$\text{\# of nodes } (n) \geq N(h) > 2^{h/2}$$

$$n > 2^{h/2}$$

$$\lg(n) > h/2$$

$$2 \times \lg(n) > h$$

$$h < 2 \times \lg(n) \quad , \text{ for } h \geq 1$$

Proved: The maximum number of nodes in an AVL tree of height h is less than $2 \times \lg(n)$.