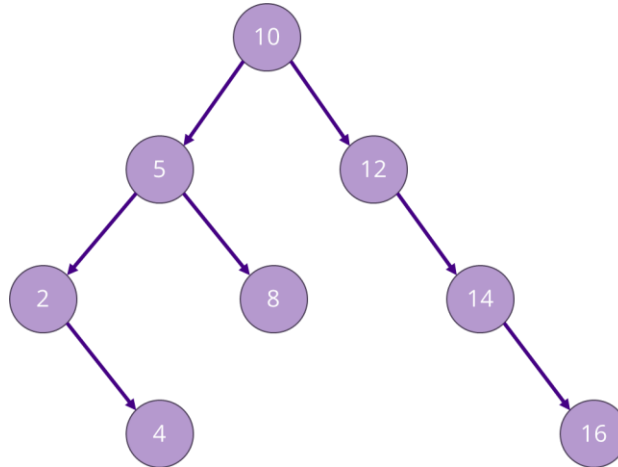
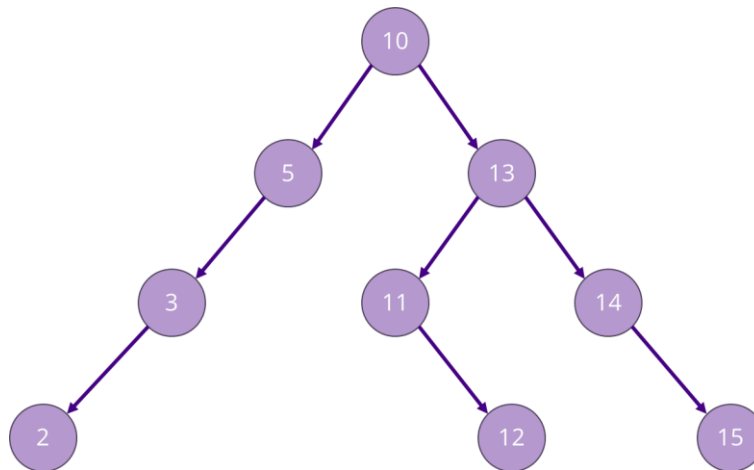


AVL Balance Factors

- Label the following BST with AVL balance factors. Is this a properly balanced AVL tree?

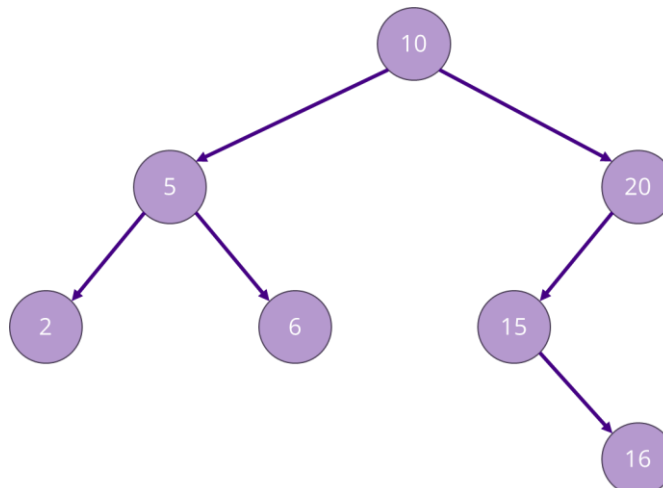


- Label the following BST with AVL balance factors. Is this a properly balanced AVL tree?



Rotations

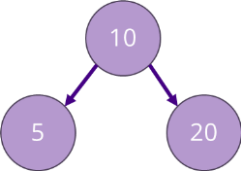
- Consider the following AVL tree. First, label the balance factors.



- Next, circle the unbalanced (critical) node. State the rotation needed to balance the tree: _____

Insertions

Show how the AVL tree below changes when the following operations are applied (in order):

START	1. insert(3)	2. insert(2)
		
3. insert(7)	4. insert(6)	

Tree Height

- For any binary tree: $\lceil \log_2 n \rceil \leq h(n) < n$, where n is the number of nodes and $h(\dots)$ represents the height
- For an AVL tree: $\lceil \log_2 n \rceil \leq h(n) < 1.44 \log_2(n)$ (approximately)
- Imagine that 2^{20} (about 1 million) items are added to an initially empty AVL tree.
 - Which of the following could reasonably be the height of the resulting tree?
 - **Circle all that apply:** 10, 15, 20, 25, 50, 100, 1000, 1000000