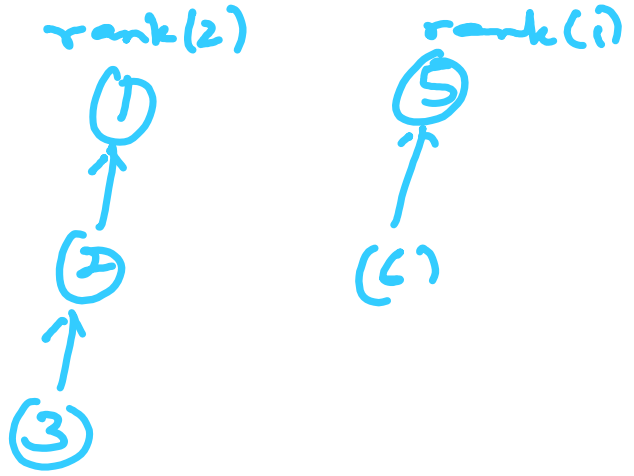
Union by rank and path compression example

16 November 2020 20:04

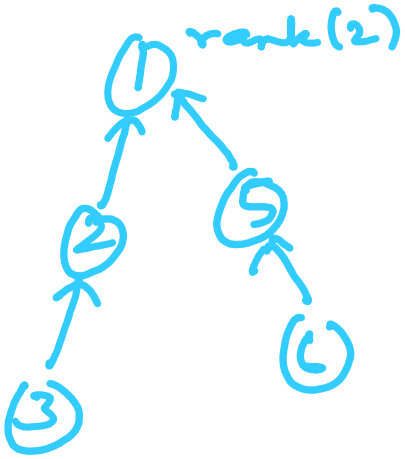
Union by Rank example

Consider the following trees



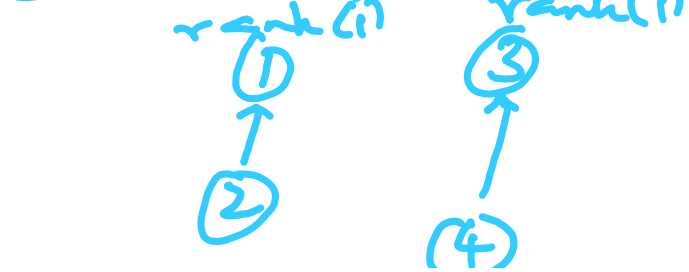
[Rank is longest path from root to leaf]

Now Union(1,5) is



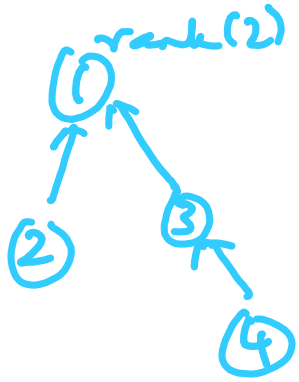
Smallest rank is attached as child of largest rank. In this case after union rank doesn't change.

Consider



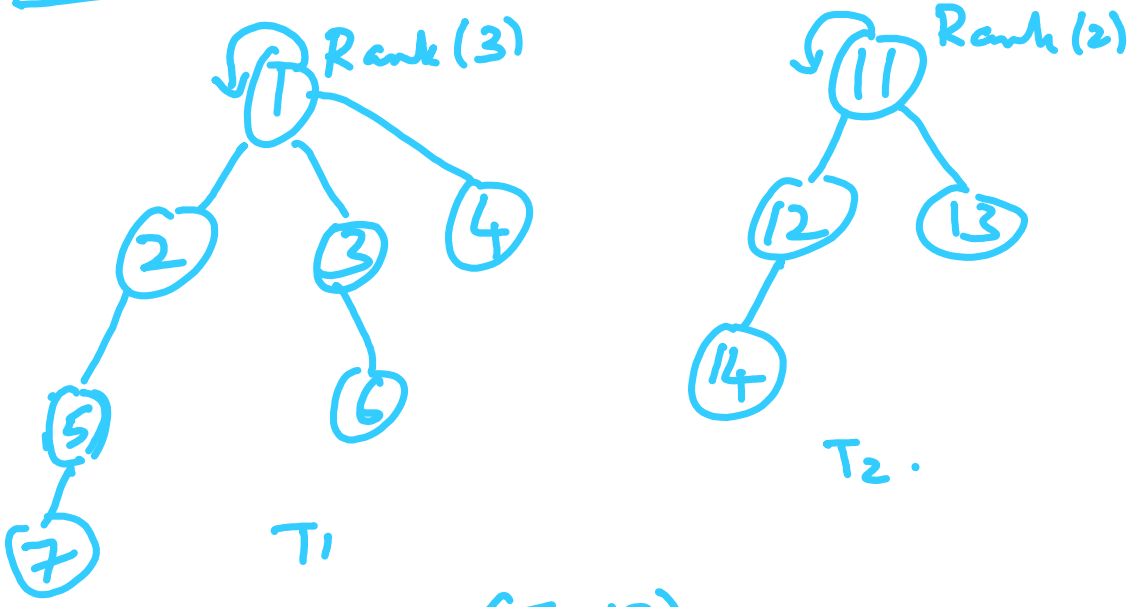
Both ranks are equal.
∴ Add arbitrarily any one as child of another.

(a)



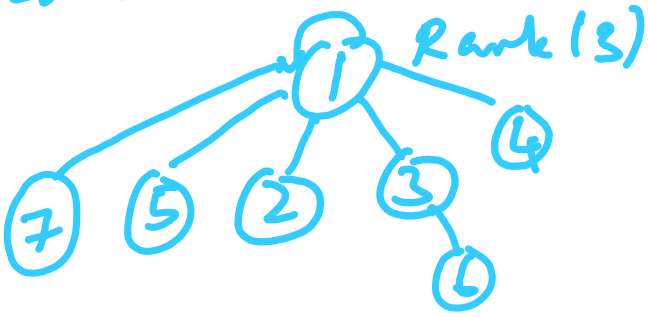
After union rank is increased by 1.

Union by Rank & Path Compression

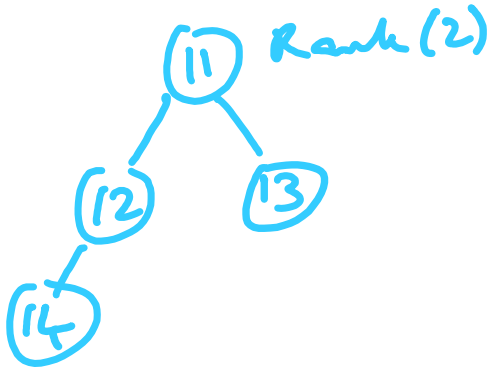


Find union(7,13)

Path compression of T_1 is



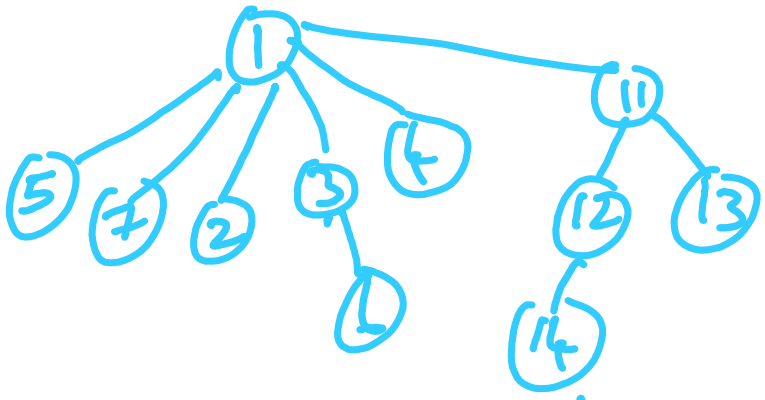
Path Compression of T_2 is (no change)



Note: Path Compression doesn't change rank.

Now Union(7, 13) is,

Since Rank of tree with root 1 is greater than rank of tree with root 11, we have



is the resultant tree.