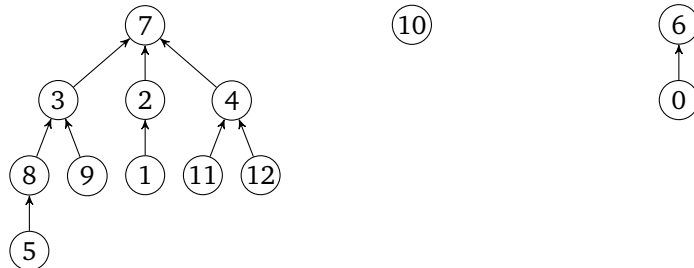# Section 09: Disjoint Sets and TA's Choice

1. Disjoint sets

(a) Consider the following trees, which are a part of a disjoint set data-structure:
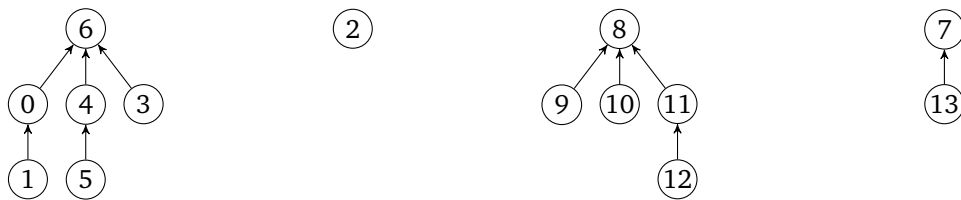
For these problems, use both the **weighted quick union by size** and **path compression** optimizations.

(i) Draw the resulting tree(s) after calling `find(5)` on the above. What value does the method return?

(ii) Draw the final result of calling `union(2,6)` on the result of part a.
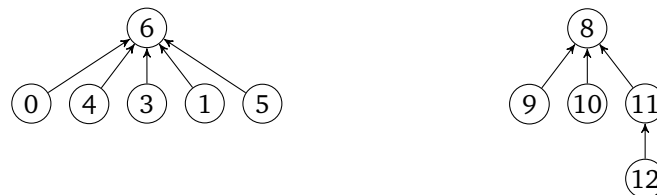
(b) Consider the disjoint-set shown below

What would be the result of the following calls on union if we add the "weighted quick union by size" and "path compression optimizations.

(i) `union(2, 13)`

(ii) `union(4, 12)`

(iii) `union(2, 8)`

(c) Consider the disjoint-set shown below

What would be the result of the following calls on union if we add the "weighted quick union by size" and "path compression optimizations.

(i) `union(10, 0)`