

1/22 Disjoint Set Part 1

Tuesday, January 23, 2018 10:20 PM

Disjoint Set is an algorithm for storing sets such that membership can be checked and sets can be merged.

These are also known as

Union-Find sets or Merge-Find sets

The reason being the two supported functions

merge(element 1, element 2)

and

find(element)

Initially all elements of the Universe are within their own set

$\{1\}$ $\{2\}$ $\{3\}$... $\{n\}$

gradually sets union together through the merge function, and to check if two elements are within the same set we check if their finds are equal (e.g. $\text{find}(x) == \text{find}(y)$).

A naive solution might run in order n for a merge, but better solutions exist.

To improve performance we can utilize a tree structure to store the sets and by returning the root of the tree we can check membership.

To help balance the tree we can utilize a depth/rank array to quickly determine optimum ordering of elements.

This will be discussed further in class on Wednesday (1/24/2017)