CS4310 Union Find

I created an interface “IDisjointSet” and implement it on a class “DisjointSet”. All relations are implemented as array based where the index and the elements in each index has a strong relation for this assignment. My assumptions from this assignment is that there are no 0 in the text file because my program automatically decrease all inputs by 1 for array functionality.

The text file is read through my main class and called the class “DisjointSet” to work on union and find.

My find function recursively takes the parent of an index until it founds the parent of the relation (parent of that element would be itself) and returns the parent of the relation.

My union function finds the parent of x and the parent of y and set the parent of y as x. Thus a relation will form for each of them.

First, I will use makeSet function to create all element a parent of itself. Once that is done, for each line of input, union each of them to form to a relation. Once completed, using calcNumTables to calculate the number of index that has an element that is itself, that would mean that the element is a parent of the whole relation.

Time complexity:

Find() : O (n), worst cast find(x) takes n times

Union: O(n), Since worst case find(x) takes n times and find(y) also takes n times.

MakeSet: O(n)

calcNumOfTables: O(n)