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**Program Structures & Algorithms  
  
Fall 2021**

**Assignment No. 3**

* Get familiar with the implementation of the quick union algorithm and implemented what is left to achieve path compression algorithm. Then test the path compression with different size of the quick union to test the algorithm.
* Number of pairs m = nx where n goes bigger when n goes bigger.
* I get this conclusion based on the graph and data show below, I think the reason behind this is the number of pairs that complete the union find array is heavily dependent on the random number generator that is used to generate the random pairs. Ideally, the m would be n-1 in best cases and huge number in the worst case. And in my situation, where I use the built-in random number generator in JAVA, it gives my linear number of pairs to complete the array.

1.Output (Snapshot of Code output in the terminal)

Graphical user interface, text, application

Description automatically generated

2.Graphical Representation (Observations from experiments should be tabulated and analyzed by plotting graphs (usually in excel) to arrive on the relationship conclusion)

Chart, scatter chart

Description automatically generated

3.Unit tests result:(Snapshot of successful unit)

Graphical user interface, text, application, email

Description automatically generated