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CSE 100, Alvarado

Winter 2017, MWF 10am

3/14/17

Report.pdf

Input File (Same 100 Actors):

- UFind: 16.1313 seconds
- BFS: 142.075 seconds

Input File (Different 100 Actors):

- UFind: 39.796 seconds
- BFS: 253.949 seconds

1. Which implementation is better and by how much?

Our union-find implementation performs a little over 7.5 times better than our BFS.

2. When does the union-find data structure significantly outperform BFS (if at all)?

Union find significantly outperforms BFS for the actor connections with the same 100 actor pairs and different 100 actor pairs as well because we want to keep adding edges year by year.

3. What arguments can you provide to support your observations?

The union-find data structure significantly outperforms BFS because BFS is O|(V+E)| where V is amount of vertices and E is the amount of edges and the worst case running time of a union-find is O|(V)| but in the case where you've already path compressed union-find is almost O(1) which makes it faster than BFS.