DISTRIBUTED OPERATING SYSTEMS PROJECT 2 -GOSSIP SIMULATOR

PROJECT REPORT

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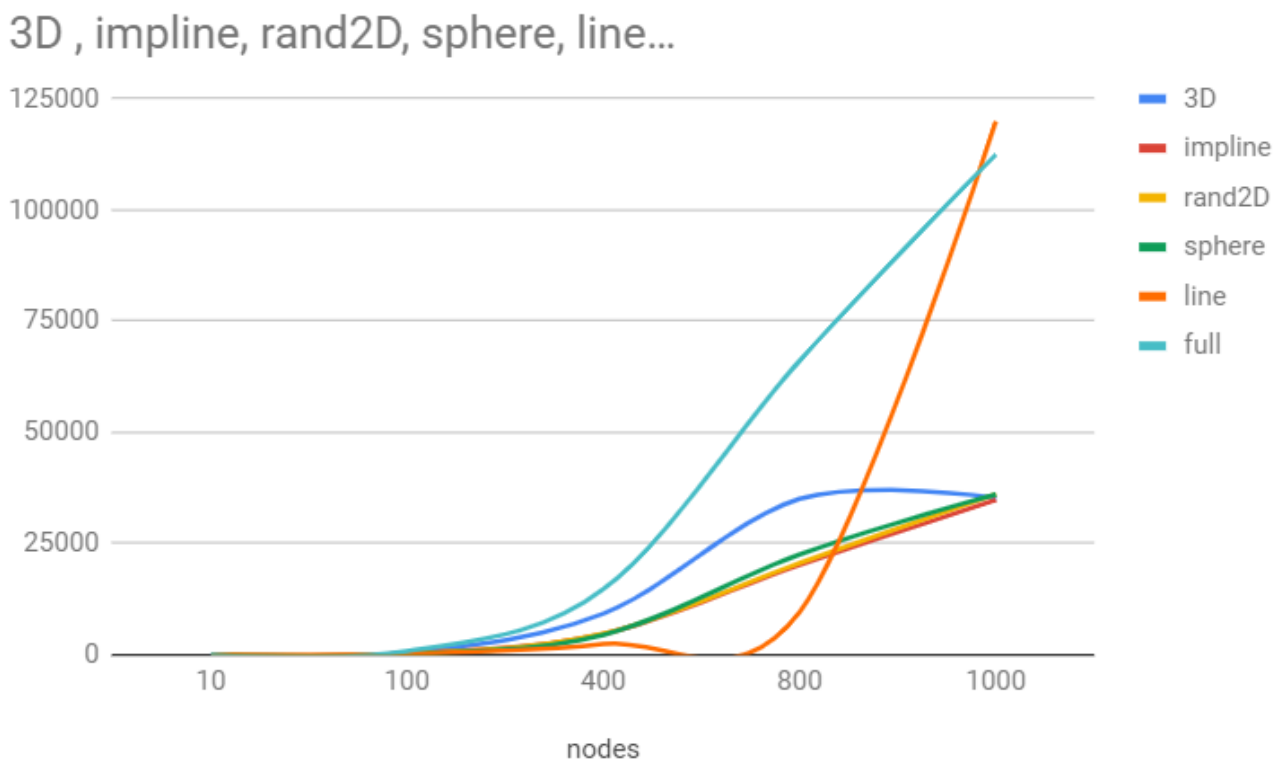
IMPLEMENTATION DETAILS

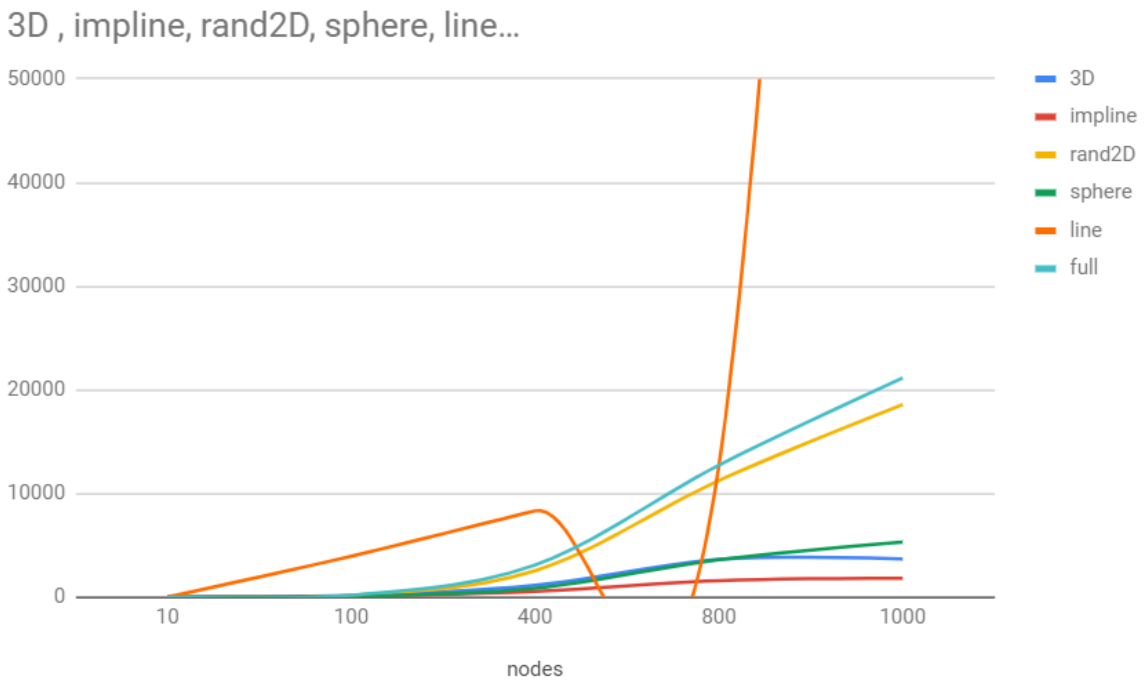
We have assumed that convergence of gossip algorithm occurs when all nodes have heard rumour 10 times. In our implementation, if a node has heard rumour than 10 times, it declares itself converged. Then, if there is a node whose all neighbours have converged, we declare that node also converged because the rumour or information flow stops at such point. When convergence is reached, program prints convergence time.

For push-sum, we have assumed that convergence occurs when a node's ratio has not changed more than 10^-10 in three consecutive rounds. We then terminate the program when all nodes have achieved convergence.

Gossip Protocol



Push Sum Protocol



These 2 graphs the graph of convergence time vs number of nodes. Inference-

1. In both algorithms, line topology has largest convergence time of all.
2. In gossip algorithm convergence time in line topology increases exponentially. For large number of nodes, 3D topology converges quickly.

INTERESTING FINDINGS

In both algorithms, convergence time for line and 2D increases exponentially. While convergence time of 3D and sphere in push sum algorithm increases very slowly. But convergence time for full network is large and increase exponentially because of large adjacency list to maintain.