PROJECT REPORT
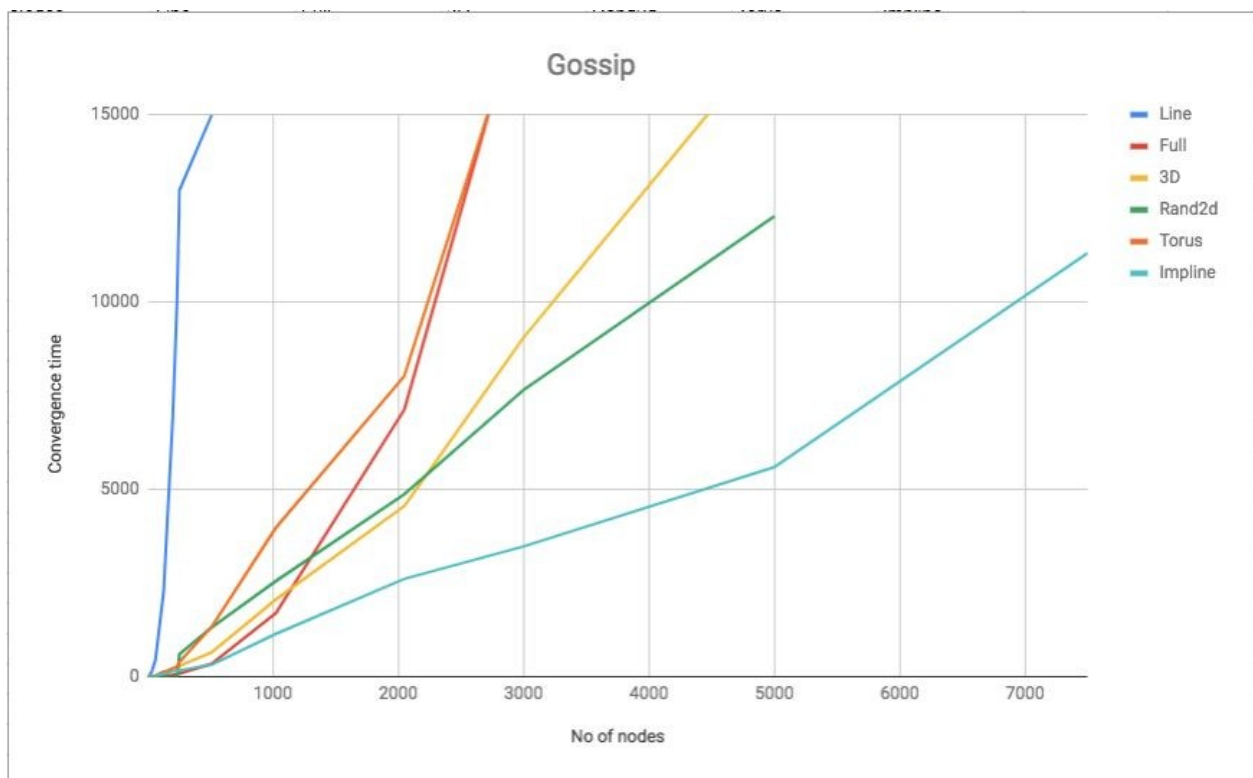## Gossip Simulator

Implementation Details:

Gossip:

Convergence for the gossip algorithm is achieved if all the nodes receive the rumor 10 times. A node would stop passing the message when it has heard the rumor for the 10th time. Convergence time in milliseconds is printed in the end.
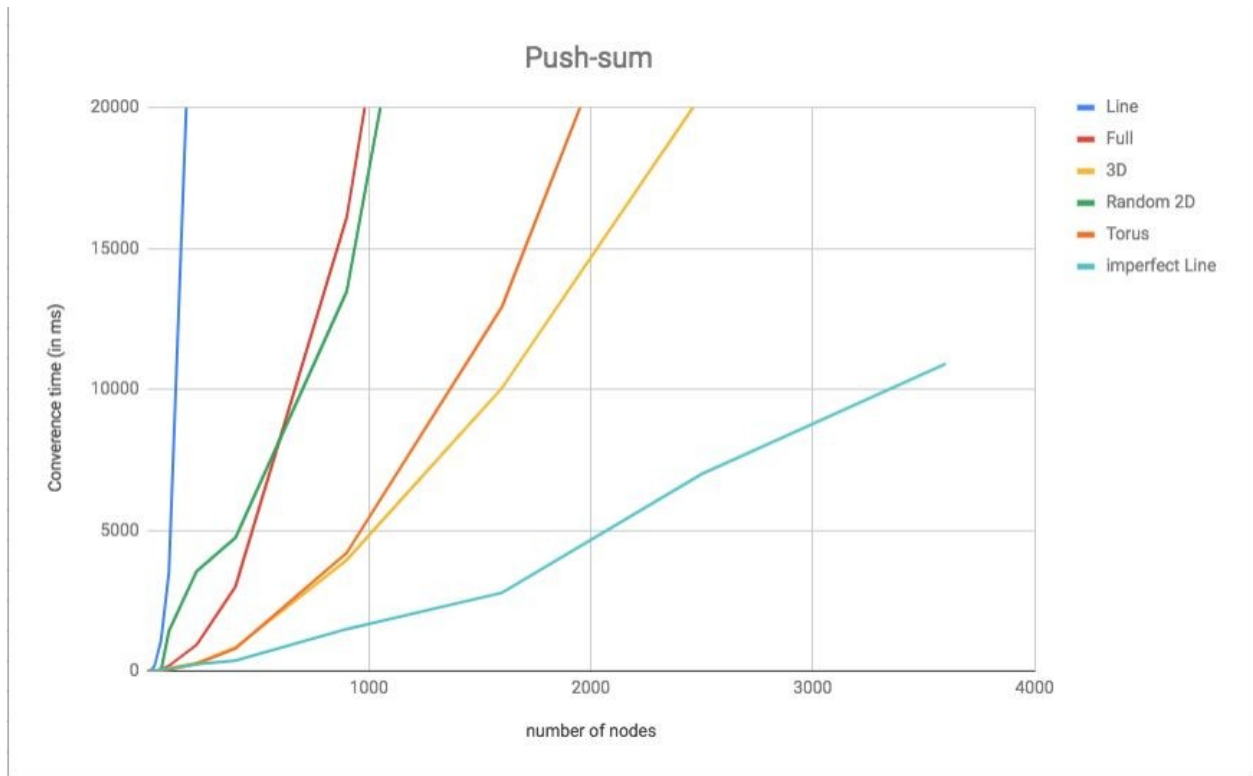

Convergence time (in ms) vs Network size (no of nodes)

Interesting observations:

1. The line topology has the highest convergence time.
2. Imperfect line topology has the least convergence time.
3. The convergence time increases sharply for full network as the number of nodes increase. This is because the size of adjacent nodes list increases with number of nodes.
4. For Random 2D topology, when there are less number of nodes, there are more possibilities for a node to not have any neighbour. Reliable convergence time is achieved when there are more than 200 nodes.
5. For Torus topology, the convergence time is almost directly proportional to number of nodes as every node will have only 4 neighbors.
6. For networks as small as 100-200 nodes, full network has lowest convergence time.

Push-sum:

A node terminates when the s/w ratio difference has not crossed 10^-10 in three consecutive message receiving steps. Push-sum algorithm is converged when all the nodes terminate. Convergence time is difference between start time and the time at which last node terminates.

Convergence time (in ms) vs Network size (no of nodes)

Interesting Observations:
1. Line topology has highest convergence time.
2. Imperfect line topology has the least convergence time.
3. The convergence time for full and Random 2D increases more sharply than 3D, Torus and Imperfect 2D. This is because full and random 2D need more memory for storing adjacency list as the number of nodes increase.
4. As in case of Gossip, for networks as small as 100-200 nodes, full network has lowest convergence time.

Largest network for each topology and algorithm:

	Full	3D	Rand2D	Torus	ImpLine	Line
Gossip	10000	10000	10000	7500	7500	5000
Push-sum	5000	5000	5000	4000	4000	2000