**Project Report**

**Team Members:**

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**What is Working?**

The topologies which are working are:

* Line Network
* Full
* Random 2D Grid
* 3D Torus Grid
* Honeycomb
* Honeycomb with a random neighbor

The algorithms used:

* Convergence of Gossip algorithm for all topologies.
* Convergence of Push-Sum algorithm for all topologies.

**Instructions:**

1. Unzip Gupta-Mehta.zip file and Project2 folder and open the command prompt and enter the below mix command to compile and run the code.

E.g. mix run lib/input.exs 1000 full gossip

1. Input: Enter node, topology and algorithm

Output: Convergence value along with final s/w value for push-sum algorithm. Topologies (full, line, rand\_2d, honeycomb, honeycombrandom, 3dtorus). Algorithms (gossip, pushsum)

Convergence reached at 1312ms

1. After converging, the method listens to the number of nodes in topology and reduces the counter on each node convergence.
2. Number of nodes vs convergence time graph is plotted in project report.

**Implementation Details:**

In Gossip Algorithm, if the actor receives a rumor 10 times, it kills itself. And in the PushSum Algorithm, network node is terminated when its S/W ratio did not change more than 10-10 in 3 consecutive rounds.

**Largest Network Checked:**

1 Full network

Gossip:5000

Push-Sum:2000

2 Line network

Gossip: 2500

Push-Sum: 2000

3 2D Random grid:

Gossip: 2500

Push-Sum: 2000

4 Honeycomb:

Gossip: 5000

Push-Sum: 2500

5 Honeycomb Random:

Gossip: 10000

Push-Sum: 2500

6 3D Torus:

Gossip: 10000

Push-Sum: 2500

A screenshot of a social media post

Description automatically generated

X-Axis : Number of nodes for each topology

Y-Axis: Time(in ms)

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