**COP5612 – Fall 2017**

**Project 2 – Gossip Simulator Report**

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We have run the program for all possible combinations of (topology, algorithm) and for the below mentioned number of nodes we have run the program 3 times and considered average of the 3 results to plot the graphs.

**Observations:**

1. The order in which convergence takes time for a typical topology as per our observation in the order from fast to slow is:

Full (fastest) < Imperfect2D < 2D < Line (slowest)

Thus, we can say that, the more number of active neighbors you have, the faster will be the convergence.

1. The order of convergence time for an algorithm as per our observation:

Gossip < Push-Sum

Thus, we can say that, compared to a simple self-counter for Gossip, Push-Sum implements a stringent check on message variation and accordingly increments self-counter.

1. As number of nodes increase, for a given time 't' the convergence rate achieved in time t: Full (most) < Imperfect2D < 2D < Line (least)

This is mainly because the topologies convergence time discussed in observation no 1.

For **Gossip Algorithm** following table and graphs show our observation:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No of Nodes | Line | 2D | Imperfect 2D | Full |
|  | Time(ms) | Time(ms) | Time(ms) | Time(ms) |
| 8 | 17 | 14 | 38 | 6 |
| 27 | 45 | 57 | 62 | 29 |
| 64 | 80 | 111 | 95 | 48 |
| 125 | 224 | 205 | 219 | 111 |
| 216 | 227 | 515 | 354 | 136 |

For **Push-sum Algorithm** following table and graphs show our observation:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No of Nodes | Line | 2D | Imperfect 2D | Full |
|  | Time(ms) | Time(ms | Time(ms) | Time(ms) |
| 8 | 483 | 808 | 1052 | 18 |
| 27 | 2245 | 4128 | 4343 | 91 |
| 64 | 7572 | 6414 | 6430 | 194 |
| 125 | 2617 | 9346 | 9873 | 205 |
| 216 | 3061 | 9261 | 24523 | 304 |

\*\*\*\*THE END\*\*\*