Bonus

Team Members

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Build Process

- Download the repository git clone https://github.com/lohitb009/Gossip-and-Push-Sum-Simulator, and go to the bonus folder
- Open cmd in src folder of project. Compile the files using: 'c(pushSum_bonus).' 'c(supervisorMod_bonus).'
- Run using 'supervisorMod_bonus:startSupervisor(TotalNodes, Topology, Algorithm, FailNodes).' Where
    - TotalNodes is a number of nodes in network
    - Algorithm is "PushSum" and Topology is "FullNetwork"
    - FailNodes is Number of nodes we want to fail

Implementation – What is working

For bonus we used Push Sum Algorithm on Full Network Topology because all the nodes converge at an efficient rate, which is conducive to analysis of failure.

In our "startSupervisor" function, we have added a "FailedNodes" parameters that will accept the number of nodes we want to fail.

Observations:

1. When we passed the number of FailedNodes, we observed that the topology wasn't converging. This is because in our network we have dead actors which are not transmitting any call to the random actor because they are dead.

```
PS D:\UF STuff\Fall 2022\distributedOperatingSystem\assignments\Gossip-and-Push-Sum-Simulator\src> erl
Eshell V13.0.4  (abort with ^G)
1> c(supervisorMod_bonus).
{ok,supervisorMod_bonus}
Current Real Time: 22295 milliseconds
{fullNetwork,[<0.5090.0>,<0.5089.0>,<0.5088.0>,<0.5087.0>,
              <0.5086.0>,<0.5085.0>,<0.5084.0>,<0.5083.0>,<0.5082.0>,
              <0.5081.0>,<0.5080.0>,<0.5079.0>,<0.5078.0>,<0.5077.0>,
              <0.5076.0>,<0.5075.0>,<0.5074.0>,<0.5073.0>,<0.5072.0>,
              <0.5071.0>,<0.5070.0>,<0.5069.0>,<0.5068.0>,<0.5067.0>,
              <0.5066.0>,<0.5065.0>,<0.5064.0>|...],
             0,0}
Current Real Time: 22295 milliseconds
```

2. To make sure that our network converges, in our failXNodes function we will be removing the dead actors from the data structure and will recursively call the failXNodes function till we don't have the updated data structure with active actors.

```
%%% To make all the nodes converge, remove the ActorPid as soon as it
dies from the list
failXNodes((FullList--[ActorPid]), FailNodes - 1).
```

3. Once received, will follow the push-sum algorithm convergence, and observe that convergence is fast because the dead actors are being removed from the data structure

which reduces the count of active actors in the topology thus reducing the convergence time.

4. Input Actors observed 5000, observations in machine Intel core i3 machine