**Project 3 – Bonus Report**

**Failure Implementation:**

In the failure model, we accept a third input from the command line, which is the percentage of nodes to fail. We use this percentage to fail a portion of the total number of nodes in the network. When the routing operation is performed after that, every time a failed node is encountered as a hop, we replace this entry of the hop with another eligible node in the routing table. We then check if this new entry can work as a hop. Routing then proceeds as usual.  
   
We tried different percentage values such as 10 percent, 20 percent, 50 percent etc. As the value of the percentage increases, the value of the maximum number of hops decreases. We have mentioned few of the results that we got for different values of the percentage of failed nodes in this report.

**Observations:**

If the failure percentage is less, the number of hops observed are similar to the original number of nodes.

As we increase the percentage, we are reducing the network size, hence making the network smaller and the number of hops match with the logarithmic value of the new network size(after removing failed nodes).

**Results:**

numNodes = 1000 numRequests = 10 - failurePercent = 10 - maxHops = 4

numNodes = 1000 numRequests = 10 - failurePercent = 60 - maxHops = 3

numNodes = 2000 numRequests = 10 - failurePercent = 50 - maxHops = 4

numNodes = 3000 numRequests = 5 - failurePercent = 50 - maxHops = 4

**Conclusions:**

The tapestry network is therefore resilient to failures as it accounts for failures while routing by replacing it with a next best match and hence, failure wouldn’t lead to a break in communication in this network.