Project 3 Bonus

1. Failure Model

We have implemented a failure model, where a node dies permanently. For this type of failure model, an input parameter is entered from the console and based on the parameter, that many random nodes are removed from the network.

As expected, this failure model requires more number of hops for the message to reach the destination. Our experiment results also confirm this observation.

2. Execution command

./project3_bonus 200 10 20

The third parameter (20) denotes the number of failure nodes in the network, the first parameter (200) denotes the number of nodes present in the network, and the second parameter (10) denotes the number of requests each node needs to perform.

3. Results

Number of nodes	Requests	Failure Nodes	Avg. Hops for no failure	Avg. Hops with failure
10	10	1	0	0.12
20	10	2	0	0.15
30	10	3	0	0.45
50	10	3	.39	0.54
50	10	5	.39	0.75
100	10	5	.91	1.29
100	10	10	.91	1.66
200	10	10	1.33	1.54
200	10	20	1.33	1.883
300	10	20	1.56	1.97
300	10	30	1.56	1.89
400	10	30	1.82	2.12
400	10	40	1.82	2.23
500	10	40	1.84	2.31
500	10	50	1.84	2.31
1000	10	50	2.09	2.46
1000	10	100	2.09	2.68