

P2P - Bonus

This project implements the Chord protocol, a scalable peer-to-peer lookup service for internet applications, using the Pony programming language and the Actor Model. The implementation includes node and connection failure models to test the system's resilience.

This implementation includes two types of failure models:

- Node Failure: Simulated in the 'ChordNetwork' actor with a 10% probability during lookups.
- Connection Failure: Simulated in the 'ChordNode' actor with a 5% probability during lookups.

These failure models help test the resilience of the Chord network under adverse conditions.

- **Team Members:** Shrey Gupta and Yash Bhalla
- **GitHub:** <https://github.com/yashbhalla/P2P>

```
(base) yashbhalla@MacBookPro Bonus % ./Bonus 5 10
Node 5441686242171130467 has failed during lookup
Node 4138030559430487816 has failed during lookup
Node 4138030559430487816 has failed during lookup
Node 4138030559430487816 has failed during lookup
Node 15938286620267597798 has failed during lookup
Node 1292684828888631372 has failed during lookup
Node 5441686242171130467 has failed during lookup
Node 5441686242171130467 has failed during lookup
Node 5441686242171130467 has failed during lookup
Node 4138030559430487816 has failed during lookup
Node 4138030559430487816 has failed during lookup
Node 5386887402990904503 has failed during lookup
Node 5441686242171130467 has failed during lookup
Average number of hops: 3.38
(base) yashbhalla@MacBookPro Bonus %
```

```
(base) yashbhalla@MacBookPro Bonus % ./Bonus 3 2
Node 9928974378599094246 has failed during lookup
Average number of hops: 2.16667
(base) yashbhalla@MacBookPro Bonus % ./Bonus 5 5
Node 15584061541842797158 has failed during lookup
Node 1673237796164448035 has failed during lookup
Node 6470427133283227313 has failed during lookup
Node 6470427133283227313 has failed during lookup
Node 15584061541842797158 has failed during lookup
Node 17022210684973872396 has failed during lookup
Node 17022210684973872396 has failed during lookup
Average number of hops: 3.04
(base) yashbhalla@MacBookPro Bonus %
```