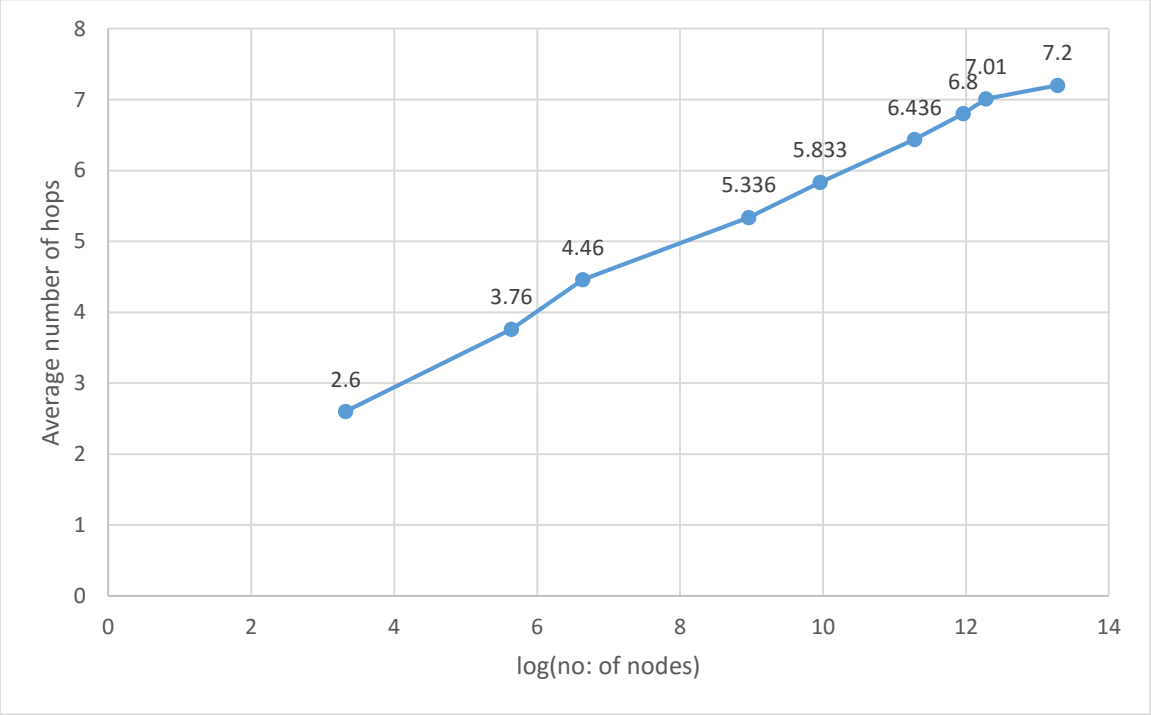
Analysis

N (no. of nodes)	log(N)	Average Number of Hops
10	3.32	2.6
50	5.64	3.76
100	6.64	4.46
500	8.96	5.336
1000	9.96	5.833
2500	11.28	6.436
4000	11.96	6.8
5000	12.28	7.01
10000	13.28	7.2

The following is the graph representation of the above table.



It is observed that the average number of hops is of the order **O(log N)**, where N is the number of nodes in the network.

We used “scala futures” to handle data between asynchronous message requests in the Chord network, and an “akka scheduler” to generate key search request per second.

Sample Finger Tables:

For a certain case when we set m = 4 (total nodes, 2^m = 16) and numNodes = 3. We get the below finger table output:

[Node:4] FINGER TABLE:

PREDECESSOR -> 12, SUCCESSOR -> 9

---

m:0, fingers(0).start = 5, fingers(0).node = 9

---

m:1, fingers(1).start = 6, fingers(1).node = 9

---

m:2, fingers(2).start = 8, fingers(2).node = 9

---

m:3, fingers(3).start = 12, fingers(3).node = 12

[Node:9] FINGER TABLE:

PREDECESSOR -> 4, SUCCESSOR -> 12

---

m:0, fingers(0).start = 10, fingers(0).node = 12

---

m:1, fingers(1).start = 11, fingers(1).node = 12

---

m:2, fingers(2).start = 13, fingers(2).node = 4

---

m:3, fingers(3).start = 1, fingers(3).node = 4

[Node:12] FINGER TABLE:

PREDECESSOR -> 9, SUCCESSOR -> 4

---

m:0, fingers(0).start = 13, fingers(0).node = 4

---

m:1, fingers(1).start = 14, fingers(1).node = 4

---

m:2, fingers(2).start = 0, fingers(2).node = 4

---

m:3, fingers(3).start = 4, fingers(3).node = 4
