

DHT

Am rulat sistemul DHT si ma avut cateva erori pe care le-am remediat. De asemenea am modificat metoda de actualizare a FingerTable-ului deoarece nu era corecta (succesorii nu erau identificati corect cand cautarea trecea de ultimul nod deoarece id-urile erau comparate linear si nu circular).

La inregistrarea unui nod se trimit un mesaj de inregistrare catre DiscoveryNode care verifica sa nu existe coliziuni de id si trimit un nod random din inel. Nodul initiaza o cautare a succesorului pentru a gasi pozitia la care va fi inserat. Aceasta cautare se face folosind FingerTable din fiecare nod, care contine mai multe intrari ce indica un nod successor aflat la o distanta $2^{(i-1)}$ fata de nod.

- 1. Inregistrare nod cu ID 7:** Deoarece este primul nod din inel, nu se initiaza etapa de localizare a nodului successor.

```
PS C:\Users\Ruben\Desktop\Sisteme Distribuite\Laborator6\Implementation-Of-Chord-Peer-To-Peer-Network> java cs555.chord.node.Peer 172.20.32.1 8089 nodeA 7
Initializing the Messaging Node
Server Started on Port Number 55472
Node ID: 7
Data sent
Message Type: 1
OnEvent messageType_1
0:172.20.32.1:55473:55472:nodeA
Welcome the first node in Chord Ring.
```

DiscoveryNode

```
PS C:\Users\Ruben\Desktop\Sisteme Distribuite\Laborator6\Implementation-Of-Chord-Peer-To-Peer-Network> java cs555.chord.node.DiscoveryNode 8089
Server Started on Port Number 8089
Message Type: 0
Registration Successful for IP 172.20.32.1 and port number 55473:55472
Node ID: 7
Data sent
```

FingerTable – toate intrarile indica nodul introdus

```
ft
Command ft
key is: 1 & Value is: 7:172.20.32.1:55472
key is: 2 & Value is: 7:172.20.32.1:55472
key is: 3 & Value is: 7:172.20.32.1:55472
key is: 4 & Value is: 7:172.20.32.1:55472
key is: 5 & Value is: 7:172.20.32.1:55472
```

- 2. Inregistrare nod cu ID 5:** Se trimit mesaj de inregistrare catre DiscoveryNode, iar acesta returneaza nodul 7. Nodul 5 initiaza etapa de cautare pentru a-si gasi successorul si trimit un mesaj de lookup catre nodul 7. Nodul 7 determina ca el este succesorul lui 5 si trimit inapoi raspunsul. Nodul 5 afla ca succesorul lui este 7. Apoi nodul 5 intreba cine este predecesorul lui 7, care este tot 7, iar apoi este

inserat intre successor(nod 7) si predecesorul lui 7 (tot nodul 7). Dupa inserare nodurile isi actualizeaza predecesorii si FingerTable-urile printr-un schim de mesaje.

```
PS C:\Users\Ruben\Desktop\Sisteme Distribuite\Laborator6\Implementation-Of-Chord-Peer-To-Peer-Network> java cs555.chord.node.Peer 172.20.32.1 8089 nodeB 5
Initializing the Messaging Node
Server Started on Port Number 55499
Node ID: 5
Data sent
Message Type: 1
OnEvent messageType 1
0:172.20.32.1:55473:55472:nodeA
Data sent
Message Type: 8
OnEvent messageType 8
Data sent
Data sent
Data sent
Data sent
Message Type: 5
OnEvent messageType 5
Info At: 7:172.20.32.1:55472
Predecessor At: 7:172.20.32.1:55472
Data sent
Message Type: 10
Message Type: 10
Message Type: 10
OnEvent messageType 10
OnEvent messageType 10
OnEvent messageType 10
Data sent
```

FingerTable

```
ft
Command ft
key is: 1 & Value is: 7:172.20.32.1:55472
key is: 2 & Value is: 7:172.20.32.1:55472
key is: 3 & Value is: 7:172.20.32.1:55472
key is: 4 & Value is: 7:172.20.32.1:55472
key is: 5 & Value is: 7:172.20.32.1:55472
```

FingerTable nod 7 dupa inserarea nodului 5

```
ft
Command ft
key is: 1 & Value is: 5:172.20.32.1:56342
key is: 2 & Value is: 5:172.20.32.1:56342
key is: 3 & Value is: 5:172.20.32.1:56342
key is: 4 & Value is: 5:172.20.32.1:56342
key is: 5 & Value is: 5:172.20.32.1:56342
```

3. **Inregistrare nod cu ID 11:** Acelasi process ca la inserarea nodului 5.

Finger Table

```
ft
Command ft
key is: 1 & Value is: 5:172.20.32.1:56342
key is: 2 & Value is: 5:172.20.32.1:56342
key is: 3 & Value is: 5:172.20.32.1:56342
key is: 4 & Value is: 5:172.20.32.1:56342
key is: 5 & Value is: 5:172.20.32.1:56342
```

FingerTable nod 7 dupa inserarea nodului 11

Formula: $FT[i] = \text{succ}(n + 2^{i-1})$

| i | start = $7 + 2^{i-1}$ | successor |
|---|-----------------------|-----------|
| 1 | 8 | 11 |
| 2 | 9 | 11 |
| 3 | 11 | 11 |
| 4 | 15 | 5 |
| 5 | 23 | 5 |

```
ft
Command ft
key is: 1 & Value is: 11:172.20.32.1:56377
key is: 2 & Value is: 11:172.20.32.1:56377
key is: 3 & Value is: 11:172.20.32.1:56377
key is: 4 & Value is: 5:172.20.32.1:56342
key is: 5 & Value is: 5:172.20.32.1:56342
```

FingerTable nod 5 dupa inserarea nodului 11

```
ft
Command ft
key is: 1 & Value is: 7:172.20.32.1:56340
key is: 2 & Value is: 11:172.20.32.1:56377
key is: 3 & Value is: 11:172.20.32.1:56377
key is: 4 & Value is: 5:172.20.32.1:56342
key is: 5 & Value is: 5:172.20.32.1:56342
```

- 4. Inserarea unei chei:** Este folosit acelasi mecanism de lookup pentru a gasi nodul responsabil pentru stocare (succesorul). Am folosit o cheie cu valoarea 8, iar successorul identificat a fost 11.

```
Enter File Name:
C:\Users\Ruben\Desktop\Sisteme Distribuite\Laborator6\Implementation-Of-Chord-Peer-To-Peer-Network\cs555\chord\tmp\skmishra_test\myfile.txt
Enter File ID:
8
Data sent
Enter File Name:
Message Type: 14
OnEvent messageType 14
Data sent
Message Type: 8
OnEvent messageType 8
The successor is: 11:172.20.32.1:56377
Data sent
```