

CS331 Computer Networks: Final Project

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Date: 11/30/2020

TERMINAL BASED SIMULATOR FOR DYNAMIC ROUTING CAPABILITY

This is a Simulation for Dynamic Routing implemented in JAVA using Dijkstra's shortest path algorithm

It involves:

--> Initializing routers from the text file inputted by the user

--> Simulating the process of generating routing table for each router in a given network

--> Computing the optimal path with least cost between any two specific routers

--> Updating and revising a routing tables based on change in the cost between the router and one of its directly connected neighbors

The application provides a Console Interface for the user to interact with the simulator.

Simulation:

Open up the Terminal or Command prompt:

```
$ cd src
```

```
$ javac MainEngine.java
```

```
$ java MainEngine
```

-OR-

```
$ cd src
```

```
$ java -jar MainEngine.jar
```

SCREENSHOTS

INITIAL SCREEN

```
=====
Network Terminal-Based Simulator for the Dynamic Routing Capability:
=====

----- STEP 1: INITIALIZING ROUTERS -----

Enter Text File Name to Initialize the Roters and Neighbors:
```

STEP 1: INITIALIZATION

```
=====
Network Terminal-Based Simulator for the Dynamic Routing Capability:
=====

----- STEP 1: INITIALIZING ROUTERS -----

Enter Text File Name to Initialize the Roters and Neighbors:
infoRouters.txt

Initializing
.
.
.

Initialization Process Completed!!!
```

STEP 2: BUILDING AND LISTEING PACKETS

----- STEP 2: RUNNING BUILDER AND LISTENER FUNCTIONS -----

Building and Listening Packets

.
.
.

Generating Routing Tables

.
.
.

STEP 3: DISPLAYING ROUTING TABLES

----- STEP 3: DISPLAYING ROUTING TABLES -----

Router: R1

Destination	Neighbor	Cost
R2	R2	100
R3	R3	200
R4	R2	250
R5	R3	280
R1	-	0

Router: R2

Destination	Neighbor	Cost
R2	-	0
R3	R4	270
R4	R4	150
R5	R4	250
R1	R1	100

Router: R3

Destination	Neighbor	Cost
R2	R4	270
R3	-	0
R4	R4	120
R5	R5	80
R1	R1	200

Router: R4

Destination	Neighbor	Cost
R2	R2	150
R3	R3	120
R4	-	0
R5	R5	100
R1	R2	250

Router: R5

Destination	Neighbor	Cost
R2	R4	250
R3	R3	80
R4	R4	100
R5	-	0
R1	R3	280

FURTHER OPTIONS TO CHOOSE

```
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CHOOSE FROM BELOW OPTIONS:
STEP 4. CHANGE COST BETWEEN ROUTERS
STEP 5. EXIT

Command: (enter a numeric value i.e 4 or 5)
4
Typing Format Example: R1.Change_Cost(R2,400)
Enter:
```

STEP 4: CHANGING A COST BETWEEN TWO ROUTERS

```
Enter:
R1.Change_Cost(R3,300)

----- STEP4: DISPLAYING UPDATED ROUTING TABLES -----

Router: R1
Destination Neighbor Cost
R2          R2      100
R3          R3      300
R4          R2      250
R5          R2      350
R1          -        0

Router: R2
Destination Neighbor Cost
R2          -        0
R3          R4      270
R4          R4      150
R5          R4      250
R1          R1      100

Router: R3
Destination Neighbor Cost
R2          R4      270
R3          -        0
R4          R4      120
R5          R5      80
R1          R1      200

Router: R4
Destination Neighbor Cost
R2          R2      150
R3          R3      120
R4          -        0
R5          R5      100
R1          R2      250

Router: R5
Destination Neighbor Cost
R2          R4      250
R3          R3      80
R4          R4      100
R5          -        0
R1          R3      280

EXITING SIMULATOR...
GOOD BYE!!!
```

NOTES:

- No GUI has been developed for this simulator
- Output.txt file shows all the output from the Eclipse IDE
- Zip Folder contains a txt file that was used to simulate dynamic routing. It's content goes as follow:

5

R1: (R2,100) , (R3,200)

R2: (R1,100) , (R4,150)

R3: (R1,200) , (R4,120) , (R5,80)

R4: (R2,150) , (R3,120) , (R5,100)

R5: (R3,80) , (R4,100)