CS331 Computer Networks: Final Project

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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:

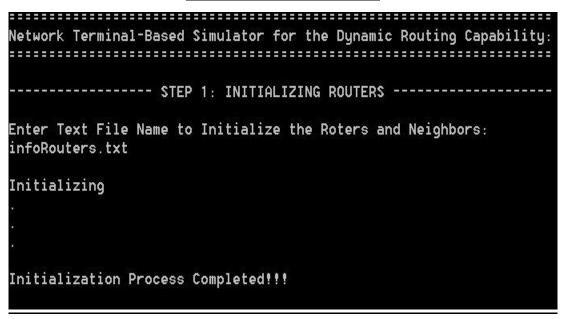
Open up the Terminal or Command prompt:

- \$ cd src
- \$ javac MainEngine.java
- \$ java MainEngine
- -OR-
- \$ cd src
- \$ java -jar MainEngine.jar

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



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
                         0
  R1
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
                         120
  R3
  R4
                         0
  R5
                R5
                         100
  R1
                R2
                         250
Router: R5
Destination
              Neighbor
                         Cost
  R2
                R4
                         250
  R3
                R3
                         80
  R4
                R4
                         100
  R5
                         0
                R3
                         280
  R1
```

FURTHER OPTIONS TO CHOOSE

```
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
                         100
  R2
  R3
                R3
                         300
  R4
                R2
                         250
  R5
                         350
                R2
                         O
  R1
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
R3
                R2
                         150
                         120
                R3
  R4
                         0
  R5
                R5
                         100
  R1
                         250
                R2
Router: R5
Destination
              Neighbor
                         Cost
  R2
                R4
                         250
  R3
                R3
                         80
  R4
                R4
                         100
  R5
                         0
                         280
                R3
  R1
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:

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)