

COMPUTER NETWORKS

DISTANCE VECTOR ROUTING PROTOCOL

Name : **ARYAN JOTISH PATIL**

Roll No: **BT18CSE096**

HOW TO RUN ?

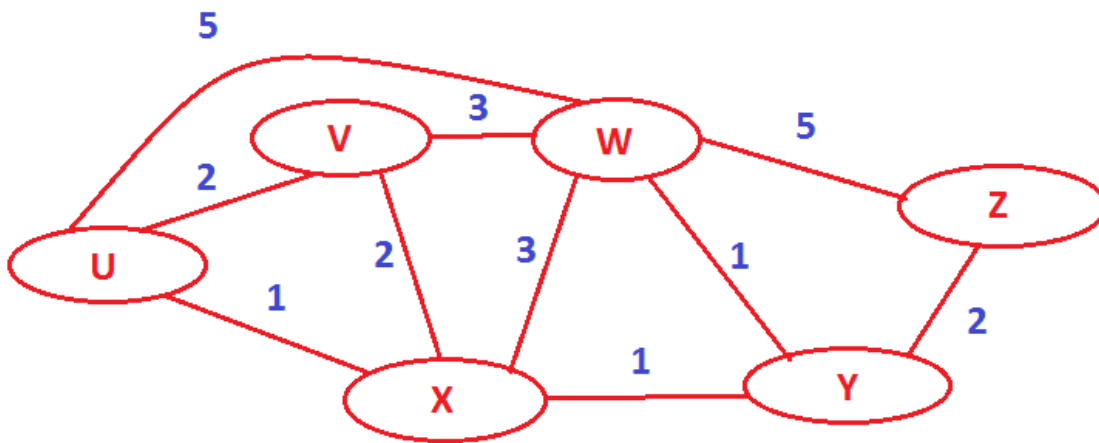
*Let's assume name of my file from where data is to be retrieved : **input.txt***

*Command to run : **python BT18CES096_dvr.py input.txt***

THE WORKING

1. THE DATA FROM INPUT FILE IS RETRIEVED AND THE CONNECTIVITY IS STORED IN A GLOBAL GRAPH.
2. A GLOBAL QUEUE IS INITIALIZED SO THAT ROUTERS ARE ABLE TO COMMUNICATE AMONG THEMSELVES.
3. 'N' NUMBER OF THREADS ARE CREATED, WHERE N = NUMBER OF ROUTERS PRESENT.
4. EACH ROUTER/THREAD CREATES ITS OWN 'ROUTING_TABLE' OBJECT FROM THE GLOBAL GRAPH.
5. 'ROUTING_TABLE' STORES : NAME, DISTANCE VECTORS, MODIFIED LIST
6. EACH ROUTER PRINTS ITS INITIAL ROUTING TABLE.
7. EACH ROUTER EXECUTES FOLLOWING FOR 4 ITERATIONS:
 - a) SLEEP/WAIT FOR 2 SECONDS.
 - b) UNCLER OLD ASTERISKS FROM MODIFIED LIST.
 - c) SEND ITS COPY OF TABLE TO ITS IMMEDIATE NEIGHBORING ROUTERS VIA THE SHARED QUEUE.
 - d) WAIT UNTIL ALL IMMEDIATE NEIGHBORING ROUTERS SEND THEIR COPY OF TABLES.
 - e) EXTRACT THE ROUTING TABLES FROM ITS QUEUE.
 - f) PERFORM THE BELLMAN-FORD ALGORITHM FOR UPDATING ITS DISTANCE VECTORS.
 - g) PRINT ITS UPDATED ROUTING TABLE.
8. WAIT FOR ALL THREADS TO JOIN THE MAIN PROGRAM AND EXIT.

THE TESTING



THE ABOVE GIVEN NETWORK WAS PROVIDED AS THE TEST INPUT

THE OUTPUT

THE INITIALIZED ROUTING TABLES: ('-1' REFERS TO INFINITE COST)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Name of Router : U

Destination	Cost	Modified
V	2	
W	5	
X	1	
Y	-1	
Z	-1	

Name of Router : V

Destination	Cost	Modified
U	2	
W	3	
X	2	
Y	-1	
Z	-1	

Name of Router : W

Destination	Cost	Modified
U	5	
V	3	
X	3	
Y	1	
Z	5	

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

Name of Router : X

Destination	Cost	Modified

U	1	
V	2	
W	3	
Y	1	
Z	-1	

Name of Router : Y

Destination	Cost	Modified

U	-1	
V	-1	
W	1	
X	1	
Z	2	

Name of Router : Z

Destination	Cost	Modified

U	-1	
V	-1	
W	5	
X	-1	
Y	2	

1ST ITERATION : ('*' REPRESENTS THE CHANGE)

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

Iteration Number: 1 for Router Name: Z

Name of Router : Z

Destination	Cost	Modified
U	10	*
V	8	*
W	3	*
X	3	*
Y	2	

Iteration Number: 1 for Router Name: V

Name of Router : V

Destination	Cost	Modified
U	2	
W	3	
X	2	
Y	3	*
Z	8	*

Iteration Number: 1 for Router Name: U

Name of Router : U

Destination	Cost	Modified
V	2	
W	4	*
X	1	
Y	2	*
Z	10	*

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

-----
Iteration Number:  1  for Router Name:  X
-----
Name of Router :  X
-----
Destination      Cost      Modified
-----
U                 1
V                 2
W                 2      *
Y                 1
Z                 3      *
-----

Iteration Number:  1  for Router Name:  W
-----
Name of Router :  W
-----
Destination      Cost      Modified
-----
U                 4      *
V                 3
X                 2      *
Y                 1
Z                 3      *
-----

Iteration Number:  1  for Router Name:  Y
-----
Name of Router :  Y
-----
Destination      Cost      Modified
-----
U                 2      *
V                 3      *
W                 1
X                 1
Z                 2
-----
```

2ND ITERATION : ('*' REPRESENTS THE CHANGE)

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

-----
Iteration Number:  2  for Router Name:  Y
-----
Name of Router :  Y
-----
Destination      Cost      Modified
-----
U                 2
V                 3
W                 1
X                 1
Z                 2
-----

Iteration Number:  2  for Router Name:  Z
-----
Name of Router :  Z
-----
Destination      Cost      Modified
-----
U                 4      *
V                 5      *
W                 3
X                 3
Y                 2
-----

Iteration Number:  2  for Router Name:  U
-----
Name of Router :  U
-----
Destination      Cost      Modified
-----
V                 2
W                 3      *
X                 1
Y                 2
Z                 4      *
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

-----
Iteration Number:  2  for Router Name:  V
-----
Name of Router :  V
-----
Destination      Cost      Modified
-----
U                 2
W                 3
X                 2
Y                 3
Z                 5      *
-----

Iteration Number:  2  for Router Name:  X
-----
Name of Router :  X
-----
Destination      Cost      Modified
-----
U                 1
V                 2
W                 2
Y                 1
Z                 3
-----

Iteration Number:  2  for Router Name:  W
-----
Name of Router :  W
-----
Destination      Cost      Modified
-----
U                 3      *
V                 3
X                 2
Y                 1
Z                 3
-----
```

3RD ITERATION : (HERE, NO CHANGE)

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

-----
Iteration Number:  3  for Router Name:  U
-----
Name of Router :  U
-----
Destination      Cost      Modified
-----
V                 2
W                 3
X                 1
Y                 2
Z                 4
-----

Iteration Number:  3  for Router Name:  V
-----
Name of Router :  V
-----
Destination      Cost      Modified
-----
U                 2
W                 3
X                 2
Y                 3
Z                 5
-----

Iteration Number:  3  for Router Name:  W
-----
Name of Router :  W
-----
Destination      Cost      Modified
-----
U                 3
V                 3
X                 2
Y                 1
Z                 3
-----
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

-----
Iteration Number: 3 for Router Name: Z
-----
Name of Router : Z
-----
Destination      Cost      Modified
-----
U                 4
V                 5
W                 3
X                 3
Y                 2
-----

Iteration Number: 3 for Router Name: X
-----
Name of Router : X
-----
Destination      Cost      Modified
-----
U                 1
V                 2
W                 2
Y                 1
Z                 3
-----

Iteration Number: 3 for Router Name: Y
-----
Name of Router : Y
-----
Destination      Cost      Modified
-----
U                 2
V                 3
W                 1
X                 1
Z                 2
-----
```

4TH ITERATION : (HERE, NO CHANGE)

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

-----
Iteration Number: 4 for Router Name: Z
-----
Name of Router : Z
-----
Destination      Cost      Modified
-----
U                 4
V                 5
W                 3
X                 3
Y                 2
-----

Iteration Number: 4 for Router Name: Y
-----
Name of Router : Y
-----
Destination      Cost      Modified
-----
U                 2
V                 3
W                 1
X                 1
Z                 2
-----

Iteration Number: 4 for Router Name: U
-----
Name of Router : U
-----
Destination      Cost      Modified
-----
V                 2
W                 3
X                 1
Y                 2
Z                 4
-----
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

-----
Iteration Number:  4  for Router Name:  V
-----
Name of Router :  V
-----
Destination      Cost      Modified
-----
U                2
W                3
X                2
Y                3
Z                5
-----

-----
Iteration Number:  4  for Router Name:  X
-----
Name of Router :  X
-----
Destination      Cost      Modified
-----
U                1
V                2
W                2
Y                1
Z                3
-----

-----
Iteration Number:  4  for Router Name:  W
-----
Name of Router :  W
-----
Destination      Cost      Modified
-----
U                3
V                3
X                2
Y                1
Z                3
-----
```

CONCLUSION : EVERY ROUTER TABLE WAS COMPLETELY MODIFIED AFTER 2 ITERATIONS