PROJECT 3

ITCS 6166

Computer Communication and Networking

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Implementation of the Distance Vector Routing:

Programming Language used: JAVA

OS: Windows 10.1

IDE: Eclipse Oxygen

Implementation:

The distance vector routing protocol in our case is implemented using JAVA. There are two java files primarily:

1) Master.java – The purpose of the master is to take the input as a directory path as an input. It then gets access to the number of routers present in the path and assigns port numbers to each of those corresponding routers.
2) MainRouter.java – The purpose of the main router is to find the shortest distance to other routers. The other functions are it also detecting link cost changes and cost recalculating. The wait time we had allowed for both receiving the distance vector from neighbours and after recomputing is 6 and 9 seconds.

We are using a single host machine for project 3.

Running Instructions:

- Firstly, in the command prompt navigate to the "src" folder and compile the files by running the command "javac *.java".
- Then give the following command "java Master <path to the "Dataabcdef" >"
- If we are checking for the link cost and the re-computation of the shortest path, then the command is "java Master <path to the "xyz" required for DVT computation>

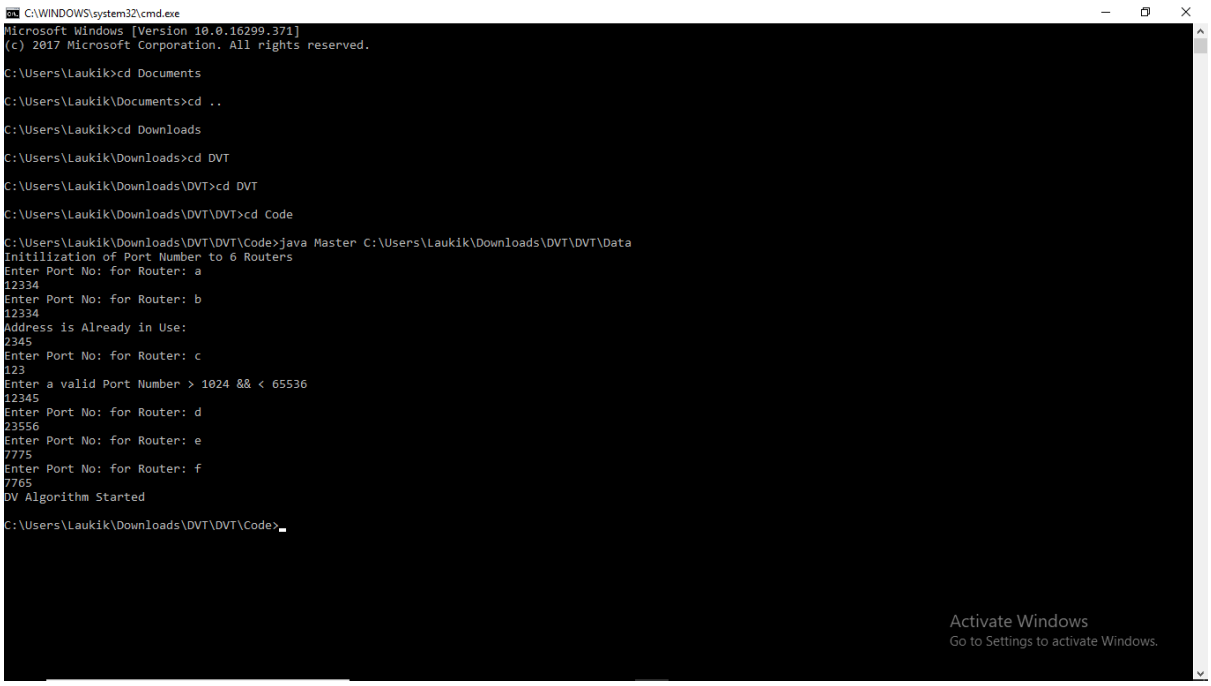
Key points:

- The wait time we had allowed for both receiving the distance vector from neighbours and after recomputing is 6 and 9 seconds.
- We made use of the process builder to invoke multiple processes for the different routers.
- There are two threads used respectively for reading and writing the distance vectors.
- Error Handling mechanism for entering the invalid port number has been included.

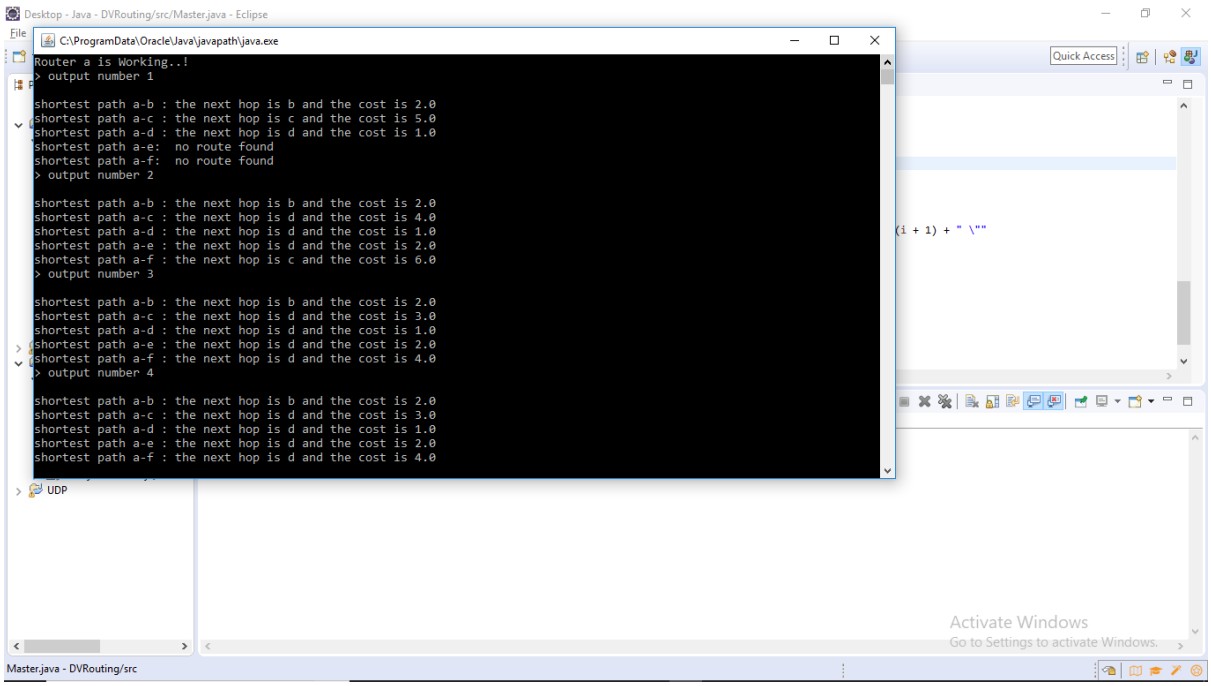
Output Simulation:

We would like to document some of our output results:

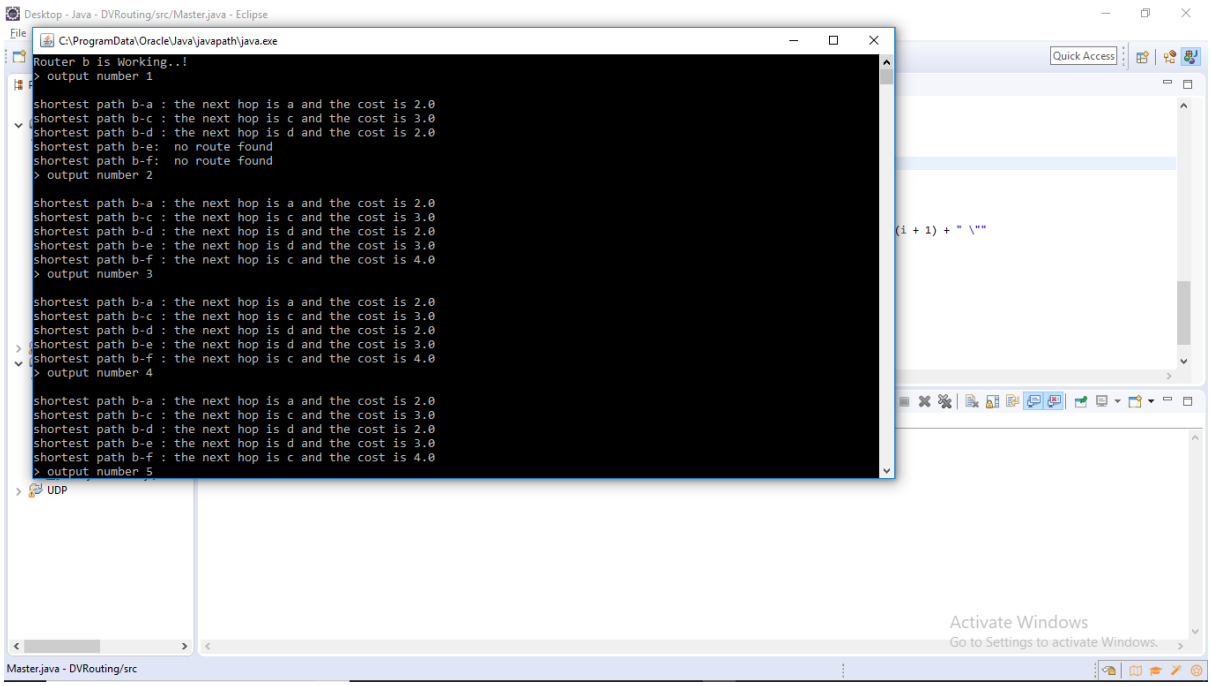
- Accessing the .dat files and then assigning the port numbers to each(6) of the routers.

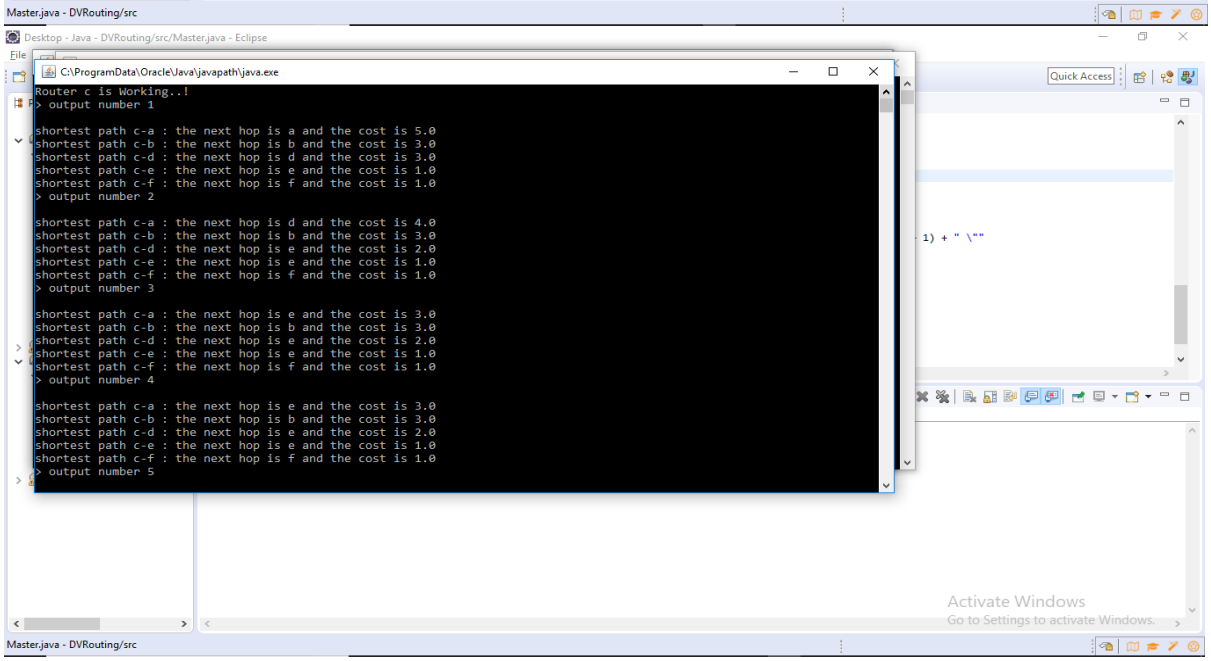


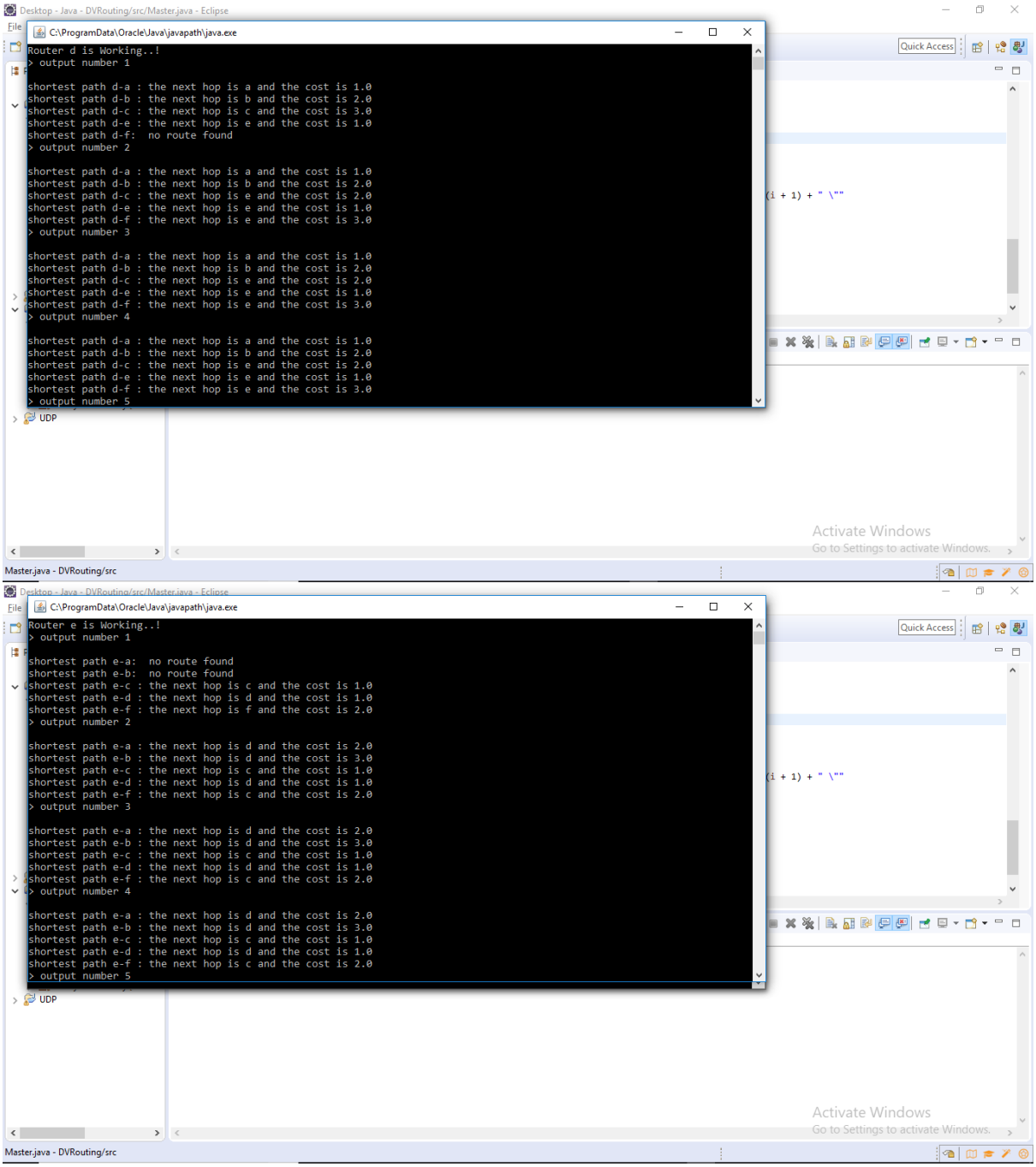
- The initial terminal output:



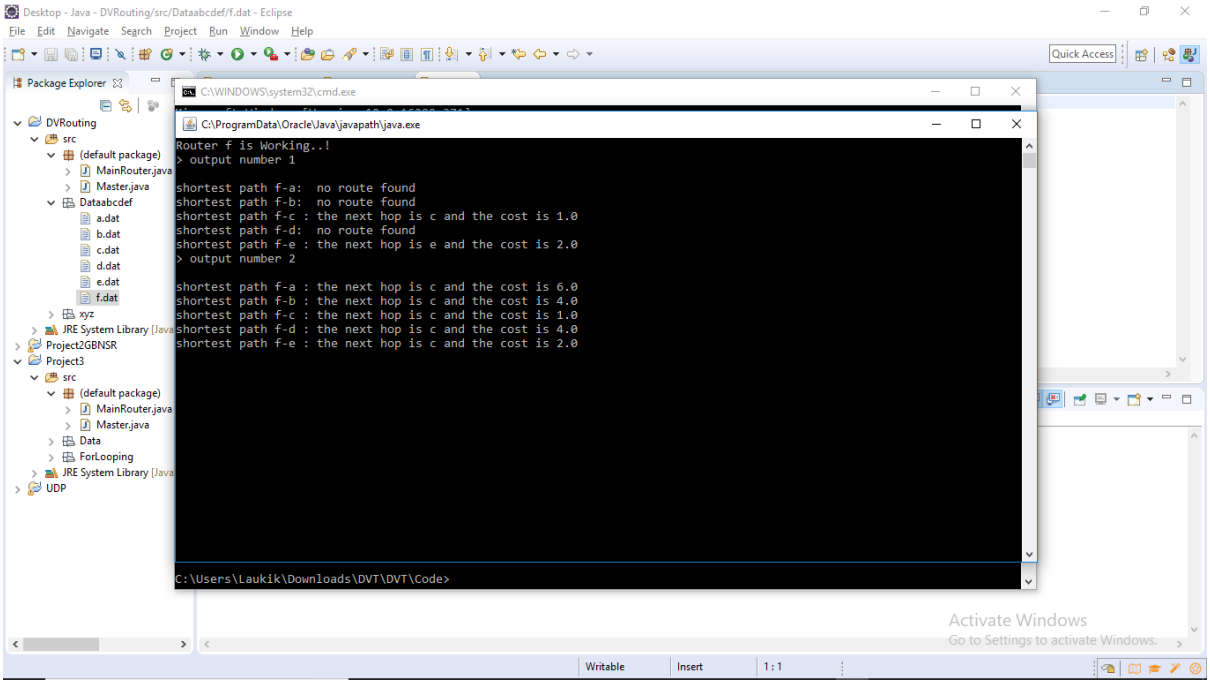
- Initial outputs of the rest of the routers from (b-f):



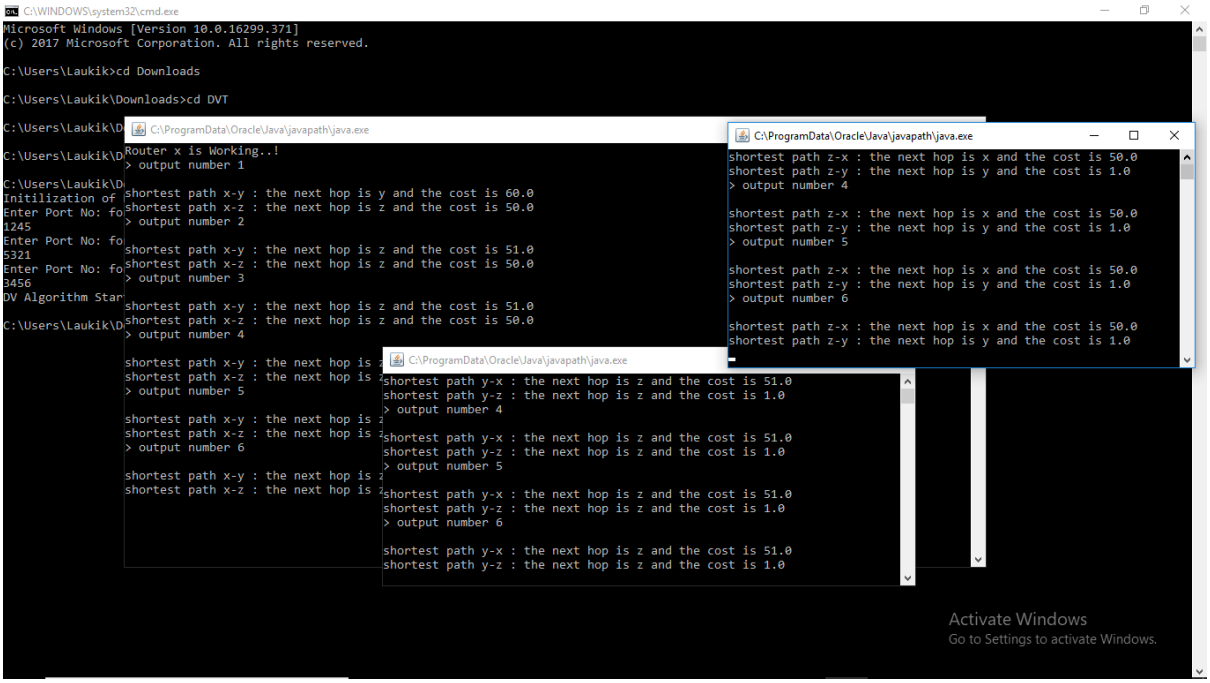



Desktop - Java - DVRouting/src/Master.java - Eclipse
C:\ProgramData\Oracle\Java\javapath\java.exe
Router d is Working..!
> output number 1
shortest path d-a : the next hop is a and the cost is 1.0
shortest path d-b : the next hop is b and the cost is 2.0
shortest path d-c : the next hop is c and the cost is 3.0
shortest path d-e : the next hop is e and the cost is 1.0
shortest path d-f: no route found
> output number 2
shortest path d-a : the next hop is a and the cost is 1.0
shortest path d-b : the next hop is b and the cost is 2.0
shortest path d-c : the next hop is e and the cost is 2.0
shortest path d-e : the next hop is e and the cost is 1.0
shortest path d-f : the next hop is e and the cost is 3.0
> output number 3
shortest path d-a : the next hop is a and the cost is 1.0
shortest path d-b : the next hop is b and the cost is 2.0
shortest path d-c : the next hop is e and the cost is 2.0
shortest path d-e : the next hop is e and the cost is 1.0
shortest path d-f : the next hop is e and the cost is 3.0
> output number 4
shortest path d-a : the next hop is a and the cost is 1.0
shortest path d-b : the next hop is b and the cost is 2.0
shortest path d-c : the next hop is e and the cost is 2.0
shortest path d-e : the next hop is e and the cost is 1.0
shortest path d-f : the next hop is e and the cost is 3.0
> output number 5
UDP
Activate Windows
Go to Settings to activate Windows.
Master.java - DVRouting/src

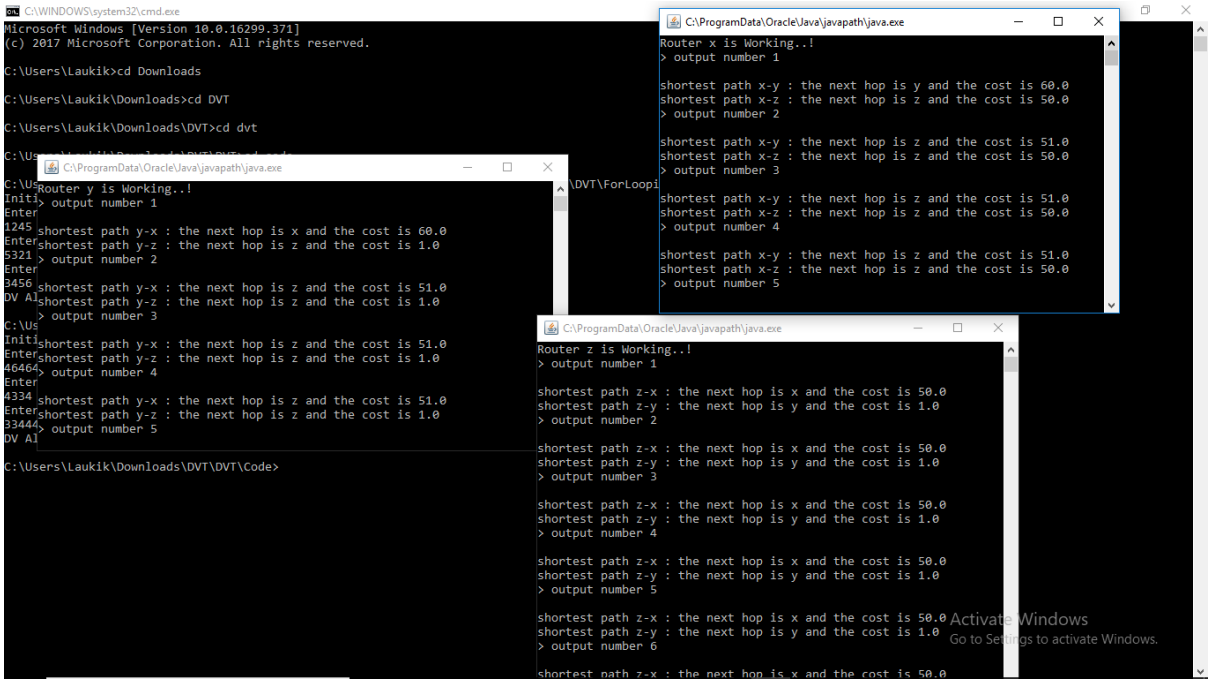
Desktop - Java - DVRouting/src/Master.java - Eclipse
C:\ProgramData\Oracle\Java\javapath\java.exe
Router e is Working..!
> output number 1
shortest path e-a: no route found
shortest path e-b: no route found
shortest path e-c : the next hop is c and the cost is 1.0
shortest path e-d : the next hop is d and the cost is 1.0
shortest path e-f : the next hop is f and the cost is 2.0
> output number 2
shortest path e-a : the next hop is d and the cost is 2.0
shortest path e-b : the next hop is d and the cost is 3.0
shortest path e-c : the next hop is c and the cost is 1.0
shortest path e-d : the next hop is d and the cost is 1.0
shortest path e-f : the next hop is c and the cost is 2.0
> output number 3
shortest path e-a : the next hop is d and the cost is 2.0
shortest path e-b : the next hop is d and the cost is 3.0
shortest path e-c : the next hop is c and the cost is 1.0
shortest path e-d : the next hop is d and the cost is 1.0
shortest path e-f : the next hop is c and the cost is 2.0
> output number 4
shortest path e-a : the next hop is d and the cost is 2.0
shortest path e-b : the next hop is d and the cost is 3.0
shortest path e-c : the next hop is c and the cost is 1.0
shortest path e-d : the next hop is d and the cost is 1.0
shortest path e-f : the next hop is c and the cost is 2.0
> output number 5
UDP
Activate Windows
Go to Settings to activate Windows.
Master.java - DVRouting/src



- As mentioned before we are taking the data in the “ForLooping” folder for performing the link cost change and re-computation.



- This is the final output after the re-computation due to a link cost change



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