

CSC 450 – Computer Networks

Assignment #5 Dijkstra's Algorithm

Dr. Timofeyev

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Responsibilities

Bradford Doughty – Polished and cleaned code, commented, tested for each node, and finished PDF.

Samantha Santiago – Used Pandas for capturing .csv files, wrote initialization of algorithm, and created format of PDF

Caleb Snook – Wrote code for solving shortest path tree, calculating least-cost paths, and tested for each node.

Before Running Program

- ONLY RUN IN LINUX
- Need Python version 2.7
- Need Pandas for CSV file
 - How to get Pandas:
 - sudo apt-get install python-pandas
 - OR yum install python-pandas
 - OR pip install pandas
 - If these are not working, link to Pandas provided below:
 - <https://pandas.pydata.org/pandas-docs/stable/index.html>
- Make sure CSV file is in the same directory as Python file

How to Run Program

- Open terminal
- Navigate to directory with Python file and CSV file
- Terminal command:
 - python [name of file].py topology.csv
- Once running, user prompted for the starting node. Type u, v, w, x, y, or z then hit ENTER
- Watch as program calculates the shortest path tree and costs of least-cost paths of the input node

Screenshots

Finally, screenshots of sample program runs are below:

Output for node u:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: u
Shortest path tree for node u:
uwv, uw, ux, uwvy, uwvzy
Costs of least-cost paths for node u:
u:0, v:6, w:3, x:5, y:10, z:12
bdoughty@bdoughty-cyberstorm ~/Desktop $
```

Output for node v:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: v
Shortest path tree for node v:
vwu, vw, vwx, vy, vyz
Costs of least-cost paths for node v:
u:6, v:0, w:3, x:7, y:4, z:6
bdoughty@bdoughty-cyberstorm ~/Desktop $
```

Output for node w:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: w
Shortest path tree for node w:
wu, wv, wx, wvy, wvyz
Costs of least-cost paths for node w:
u:3, v:3, w:0, x:4, y:7, z:9
bdoughty@bdoughty-cyberstorm ~/Desktop $
```

Output for node x:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: x
Shortest path tree for node x:
xu, xwv, xw, xy, xyz
Costs of least-cost paths for node x:
u:5, v:7, w:4, x:0, y:7, z:9
bdoughty@bdoughty-cyberstorm ~/Desktop $
```

Output for node y:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: y
Shortest path tree for node y:
yvwu, yv, yvw, yx, yz
Costs of least-cost paths for node y:
u:10, v:4, w:7, x:7, y:0, z:2
bdoughty@bdoughty-cyberstorm ~/Desktop $
```

Output for node z:

```
Terminal
File Edit View Terminal Tabs Help
bdoughty@bdoughty-cyberstorm ~/Desktop $ python dijkstras_algorithm.py topology.csv
Please, provide the node's name: z
Shortest path tree for node z:
zyvwu, zyv, zyvw, zyx, zy
Costs of least-cost paths for node z:
u:12, v:6, w:9, x:9, y:2, z:0
bdoughty@bdoughty-cyberstorm ~/Desktop $
```