Project #3: Router

120/100 Points

6/5/2023

Attempt 1 | Review Feedback **6/1/2023** | Attempt 1 Score: **120/100** | Add Comment

Unlimited Attempts Allowed

5/13/2023

Details

> ***Academic Integrity Policy***: *All of the code you turn in must have been written by only you without immediate reference to another solution to the problem you are solving or the use of AI (e.g., ChatGPT). That means that you can look at other programs to see how someone solved a similar problem, but you shouldn't have any code written by someone else visible when you write yours (and you shouldn't have looked at a solution just a few seconds before you type!). You should compose the code you write based on your understanding of how the features of the language you are using can be used to implement the algorithm you have chosen to solve the problem you are addressing. Doing it this way is "real programming" - in contrast to just trying to get something to work by cutting and pasting stuff you don't actually understand.*

This project will be in Python, but based closely on the authors' assignment:

Implementing a Distributed, Asynchronous Distance Vector Routing Algorithm
(https://media.pearsoncmg.com/aw/aw_kurose_network_3/labs/lab6/lab6.html)

Follow the instructions for the Java version of the assignment, but do it in Python. There may be a few small changes in names, etc., but go by what's in the python zip file provided here: **p3.zip**
(https://seattleu.instructure.com/courses/1608786/files/69486138?wrap=1)
(https://seattleu.instructure.com/courses/1608786/files/69486138/download?download_frd=1) .

Note that you may only modify `student_entities.py` and that is the ***only*** file you hand in here on Canvas.

the submitted file that you are claiming it. Extra credit is only granted on projects that have a score of 70 or above on the basic assignment.

This assignment is now finalized and complete.

To run the program invoke `project.py` and answer the prompts.

Here is the beginning of a run with a correct solution:

```
/Library/Frameworks/Python.framework/Versions/3.11/bin/python3 /Users/klundeen/Library/CloudStorage/OneDrive-SeattleUniversity/SeattleU/CPSC551
Network Simulator v1.0
Enter trace level (>= 0): [0]
Trace level set to 0
Will the link change (Yes/No)? [No]
Link will change: No
Enter random seed: [random]
Random seed: 40199157557755


Simulator started at t = 0.0

entity 0: initializing
node: 0
[0, 1, 3, 7]
[inf, inf, inf, inf]
[inf, inf, inf, inf]
[inf, inf, inf, inf]

entity 1: initializing
node: 1
[inf, inf, inf, inf]
[1, 0, 1, inf]
[inf, inf, inf, inf]
[inf, inf, inf, inf]

entity 2: initializing
node: 2
[inf, inf, inf, inf]
[inf, inf, inf, inf]
[3, 1, 0, 2]
[inf, inf, inf, inf]

entity 3: initializing
node: 3
[inf, inf, inf, inf]
[inf, inf, inf, inf]
[inf, inf, inf, inf]
[7, inf, 2, 0]

node 0: update from 1 received
  changes based on update
node: 0
[0, 1, 2, 7]
[1, 0, 1, inf]
[inf, inf, inf, inf]
[inf, inf, inf, inf]

  sending mincost updates to neighbors
node 2: update from 1 received
  changes based on update
node: 2
[inf, inf, inf, inf]
[1, 0, 1, inf]
[2, 1, 0, 2]
[inf, inf, inf, inf]
```

and here is the end of that run a few moments later:

(https://seattleu.instructure.com/courses/1608786/modules/items/17821167)

(https://seattleu.instructu

```
[1, 0, 1, 3]
[2, 1, 0, 2]
[5, 3, 2, 0]

node 0: update from 3 received
  no changes in node 0, so nothing to do
node: 0
[0, 1, 2, 4]
[1, 0, 1, 3]
[2, 1, 0, 2]
[4, 3, 2, 0]

node 2: update from 3 received
  no changes in node 2, so nothing to do
node: 2
[0, 1, 2, 4]
[1, 0, 1, 3]
[2, 1, 0, 2]
[5, 3, 2, 0]

node 1: update from 0 received
  no changes in node 1, so nothing to do
node: 1
[0, 1, 2, 4]
[1, 0, 1, 3]
[2, 1, 0, 2]
[inf, inf, inf, inf]

node 3: update from 0 received
  no changes in node 3, so nothing to do
node: 3
[0, 1, 2, 7]
[inf, inf, inf, inf]
[2, 1, 0, 2]
[4, 3, 2, 0]

node 2: update from 3 received
  no changes in node 2, so nothing to do
node: 2
[0, 1, 2, 4]
[1, 0, 1, 3]
[2, 1, 0, 2]
[4, 3, 2, 0]

node 3: update from 0 received
  no changes in node 3, so nothing to do
node: 3
[0, 1, 2, 4]
[inf, inf, inf, inf]
[2, 1, 0, 2]
[4, 3, 2, 0]

Simulator terminated at t = 24.366285208120345 -- no packets in medium.

Process finished with exit code 0
```

Version

- Last updated: 25-May-2023 - uploaded a new p3.zip with code for extra credit fixed: added line 38 in network_simulator.py:

  `NetworkSimulator.event_list.add(Event(20000.0, LINK_CHANGE, 0))`

View Rubric

(https://seattleu.instructure.com/courses/1608786/modules/items/17821167) (https://seattleu.instructu

```
"""
CPSC 5510, Seattle University, Project #3

This assignment includes extra credit. Please note that 2 versions c
and
common_link_cost_change are implemented. Both versions are functiona
Regular version does not use routing table (@ a given node, for each
the graph,
where the next hop (must be one of the neighbors) should be).
Version #2 does use routing table.
By default, regular version will be called to execute the assignment
you wish to
try out version #2, please simply go into each class to call the cor
version #2 of
functions.
COST/graph is included as global variable to reduce the length of co
this allows
me to move most initialization codes to common_init. Please note tha
ONLY has
access to its corresponding cost vector (DV). For example, node 0 ON
to cost[0]!

NOTE: rarely, when version #2 is executed, node0 final answer when l
changed from
20 to 1 (at the bottom of the console output) can be printed in the
This is due
to the randomness of Async nature of this algo based on my observati
debugging.
To be specific, node0's right answer can be printed before the last
appearance on the
console output. This happens very rarely and if it does happen, feel
the program.
This will always fix the problem. Again, this is due to the randomne
because of
any error associated with the implementation.

:Author: Sizhe Liu # FIXME fill in _your_name
```