DEPARTAMENTO·DE·INFORMÁTICA

Programação 2 (LTI), 2019/2020

Project Report

defeatCOVID88

Group: 12

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Operating system used: Windows 10

1. Software functionality

To achieve the project sheet's objective, the software starts by reading the network input file, creates new Person-type objects as nodes and Connection-type objects as edges with weights. These two classes, essentially, form a digraph.

Afterwards, it reads the test set file and creates a Subjects-type collection, containing each connection to be tested.

Then, it performs a depth-first search taking as parameters each pair in the Subjects collection. If there is a connection between them, it picks the path with the least weight (in this case, the least time it will take them to get infected) and outputs them into a file.

2. Participation in the project

This project was built in its totality with equal effort from each peer in every component.

3. Additional built functions

An additional module was built: graphCOVID88, which allows its user to visualize the given network file's respective graph.

- To run this module, the user must have the networkx and matplotlib packages installed (*pip install networkx* and *pip install -U matplotlib*).
- The correct syntax to run this module is:

  ```
  python graphCOVID88.py inputFile.txt
  ```

  where `inputFile.txt` is a file containing the social network with the format as specified in the project sheet.

- It also outputs the graph to an image file (`graphTestSet.png`).

Certain exceptions were also handled to let the user better understand what went wrong while reading the files, mainly `FileNotFound`, `Value` and some `Assertion` errors.

4. To-do functionalities

Since the program runs as expected and does what was requested in the project sheet, no functionalities were left to code.

5. Known errors

No errors are known to occur.

6. Criteria used for the test sets

The criteria we used for the different test sets are:

- Multiple subjects in a social network
- Big paths that assure us different results for the same connection reversed (for example: André > Ricardo and Ricardo > André, Ricardo would take more time to get infected from André than André would from Ricardo)
- Immune subjects between connections / contact with immune subjects
- Longer paths that take less time to infect someone than a shorter path (longer paths with less weight than a shorter path)
- Isolated contacts
- Non-existent contacts (out of the social network)