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CSCI 4220-E01

Programming Assignment 01

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Contents

1 Questions

Question 1.

At the end of the tutorial, please do the following:

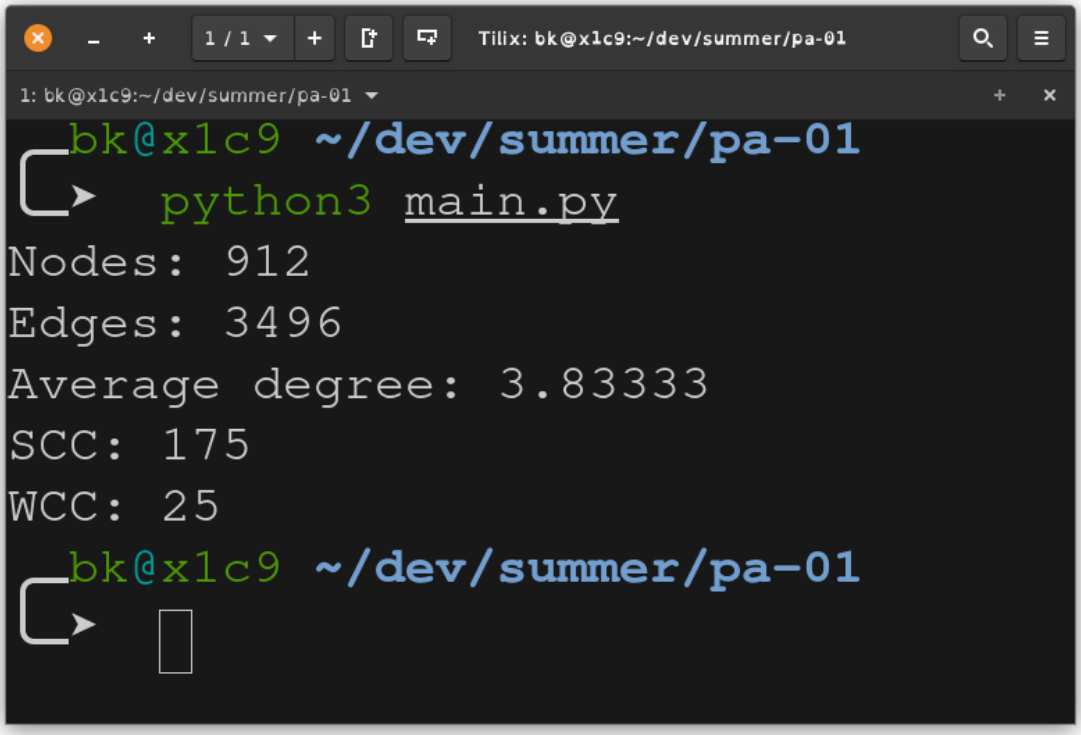
1. Install Python.
2. Install Python tools
    - NumPy
    - SciPy
    - Matplotlib
    - Networkx
3. Download the data-set *'cambridge_net.txt'*
4. Find the number of nodes and edges, the average degree, and the number of connected components (Slides 29 and 30 in the tutorial.)
5. Submit the Python code and a screenshot of your result.
   Please submit a zipped file.

2 Code

Code available here

```
0 import networkx as nx ## version 2.4 library for studying graphs
    and networks

2 infile = open('dataset/cambridge_net.txt', "r+b")

4 cam_net = nx.read_adjlist(infile, create_using=nx.DiGraph(),
    nodetype=int)

6 thisdict = dict(cam_net.adj)

8 infile.close()

10 N = cam_net.order()

12 K = cam_net.number_of_edges()

14 avg_deg = float(K)/N

16 print("Nodes:", N)

18 print("Edges:", K)

20 print("Average degree:", round(avg_deg, 5)) ## rounded for
    aesthetic

22 print("SCC:", nx.number_strongly_connected_components(cam_net))

24 print("WCC:", nx.number_weakly_connected_components(cam_net))
```

3 Output


Tilix: bk@x1c9:~/dev/summer/pa-01
1: bk@x1c9:~/dev/summer/pa-01
bk@x1c9 ~/dev/summer/pa-01
python3 main.py
Nodes: 912
Edges: 3496
Average degree: 3.83333
SCC: 175
WCC: 25
bk@x1c9 ~/dev/summer/pa-01