SA367 · Mathematical Models for Decision Making   Spring 2022 · Uhan

Quiz 3 – 2/3/2022

Problem	Weight	Score
1	1	
Total		/ 10

Instructions. You have 15 minutes to complete this quiz. You may <u>not</u> use any other materials (e.g., notes, homework, website).

<u>Show all your work.</u> To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem 1. Describe the shortest path problem being solved by the code below. In particular:

- draw the directed graph (nodes and edges),
- specify the edge lengths, and
- specify the source and sink nodes.

```python
import networkx as nx
import bellmanford as bf

G = nx.DiGraph()

G.add_node('banana')
G.add_node('pear')

for i in range(1, 6):
    G.add_node(i)

for i in range(1, 4):
    G.add_edge('banana', i, length=10 * i)

for i in range(3, 6):
    G.add_edge(i, 'pear', length=100 * i)

for i in range(1, 6):
    for j in range(1, 6):
        if j == i + 1:
            G.add_edge(i, j, length=1000)

length, nodes, negative_cycle = bf.bellman_ford(G, source='banana', target='pear', weight='length')
```