Network modelling and optimization
2020 Course project

Solve the traffic assignment problem on the Sioux falls network and Chicago sketch network.

1. Sioux Falls Network (24 nodes, 76 links)

Network structure:
https://github.com/bstabler/TransportationNetworks/blob/master/SiouxFalls/SiouxFalls_net.tntp
OD Demand:
https://github.com/bstabler/TransportationNetworks/blob/master/SiouxFalls/SiouxFalls_trips.tntp
Travel time on each link follows the following BPR function:

$$t_a(v_a) = t_0\left[1+0.15\left(\frac{v_a}{C_a}\right)^4\right]$$

where t_0 is the free-flow travel time, and C_a is the design capacity of each link. The values of t_0 and C_a can be found at:
https://github.com/bstabler/TransportationNetworks/blob/master/SiouxFalls/SiouxFalls_net.tntp

2. Chicago sketch network

Network structure:
https://github.com/bstabler/TransportationNetworks/blob/master/Chicago-Sketch/ChicagoSketch_net.tntp
OD demand:
https://raw.githubusercontent.com/bstabler/TransportationNetworks/master/Chicago-Sketch/ChicagoSketch_trips.tntp
Travel time on each link follows the same BPR function as above, and the free-flow time and capacity of each link can be found on the website of network structure as well.

Termination criterion:

$$\Delta = \frac{\left|\sum_{w\in W} d_w\mu_w - \sum_{a\in A} t_a(v_a)v_a\right|}{\sum_{a\in A} t_a(v_a)v_a} \le 10^{-4}$$

Required output:

1. Link flow on each link
2. The value of Δ in each iteration
3. Total running time