Please study GAMS and check the sample codes at

1. Transportation problem: <https://github.com/xzhou99/learning-transportation/tree/master/GAMS_code%20-space-time-network/0%20transportation>
2. Shortest path problem: <https://github.com/xzhou99/learning-transportation/tree/master/GAMS_code%20-space-time-network/1%20shortest_path>

and provide the GAMS codes and solution output for the following problems.

**1. Transportation problem:**

Cities 1 and 2 have 100K and 200K passengers per year, respectively. Airports 1 and 2 can accept a demand of 150K and 150K passengers per year, respectively. The city-to-airport driving times are listed at right.

Please formulate the linear programming problem and solve it using GAMS Solver.

Reading. [http://web.mit.edu/15.053/www/AMP-Chapter-08.pdf section 8.2](http://web.mit.edu/15.053/www/AMP-Chapter-08.pdf%20section%208.2)

Given:

: the demand of city ,

: the capacity of airport ,

: the driving time from city to airport

To find:

: the passengers traveling from city to airport

: the total travel cost

Model:

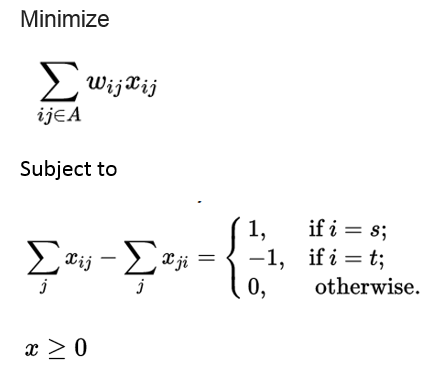
Subject to

Sample solutions from GAMS:

1. **Shortest path problem**

(you can assume the link length as 1 as a default value and try different values as a sensitivity test)

Reading. [http://web.mit.edu/15.053/www/AMP-Chapter-08.pdf section 8.2](http://web.mit.edu/15.053/www/AMP-Chapter-08.pdf%20section%208.2)

**3. Dynamic system optimal problem (For Ph.D. students)**

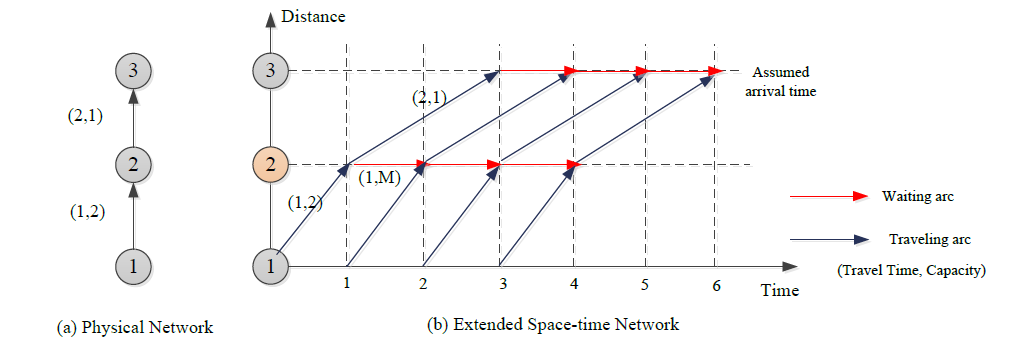
Reference:

[Capacitated transit service network design with boundedly rational agents](javascript:void(0))

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Space-time network:

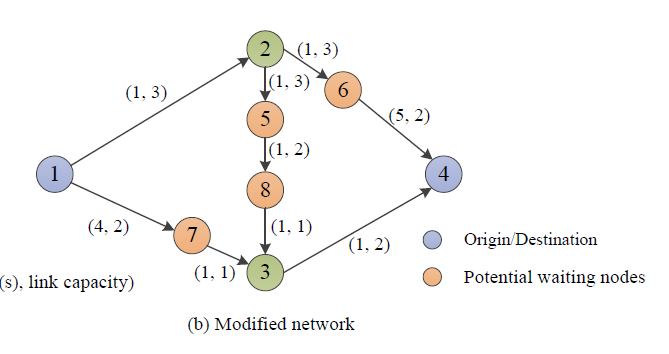
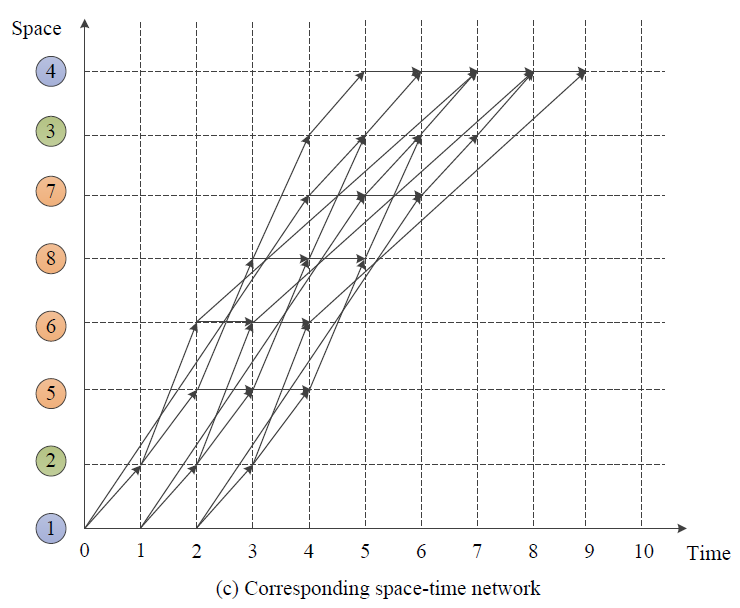


Agent-based model:

Minimize (16)

Subject to

(18)

Reference: <https://github.com/xzhou99/learning-transportation/blob/master/GAMS_code%20-space-time-network/4%20transit_network_design_and_branch_and_bound/Case_1_Transit_network_design_LR.gms>