

Flow in networks

Some company transport goods from city 1 to city n . Cities are connected with roads (one-way). Because of some limit (environment protection) in each road only a limited number of trucks from a given company can pass daily. Each road has capacity data and also length data. Given network of roads and cities write two efficient algorithms that:

- 1) will determine max. number of trucks that can go from city 1 to city n in one day.
- 2) determine a solution (consisted of max. number of tracks), for which the distance covered by trucks is the smallest.

Example:

Input:

6 9 //6 cities, 9 roads

1 4 16 6 //road from city 1 to city 4 has capacity of 16 trucks per day and length 6 km

1 5 13 4 // road from city 1 to city 5 has capacity of 13 and length of 4

4 2 12 5 //etc

5 4 4 6

2 5 9 10

5 3 14 5

3 2 7 3

2 6 20 5

3 6 4 4