

5th Lab Session

ORLAB - Operations Research Laboratory

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Exercise 10: Emergency location [February 2006]

The emergency calls manager has to allocate k ambulances on the Milan metropolitan area so that they can rapidly arrive where necessary. A set of points $C = \{1, \dots, n\}$ representing potential emergency calls are given, as well as a set of candidate sites $P = \{1, \dots, m\}$ where the ambulances can stay waiting for the calls. The times t_{ij} to move from a candidate site $i \in P$ to a potential call point $j \in C$ are known. Formulate the problem of determining in which candidate sites an ambulance has to be allocated. The objective is to minimize the maximum response time.

Variant: modify the formulation so that each point is covered by at least two ambulances, the objective is to minimize the second best response time.

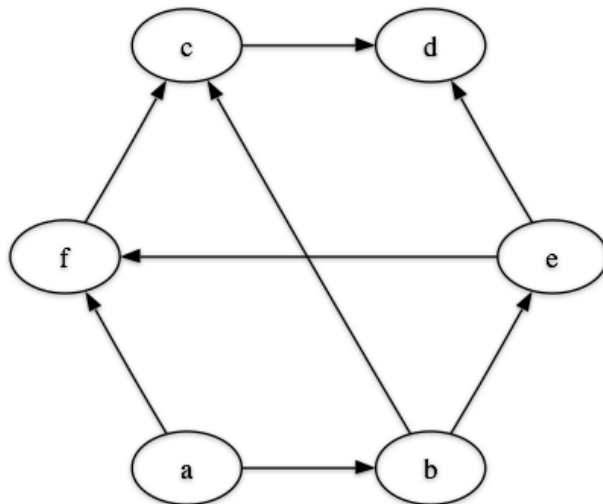
Exercise 11: Telecommunication network [March 2005]

It is given a network topology described with an oriented graph $G = (N, A)$, and a protected communication having origin in node $s \in N$ and destination in $t \in N$. The protection level of the communication tolerates a single failure over a link, that is, it is necessary to find two arc disjoint paths, a nominal and a backup path. If a link of the nominal path fails, the communication can switch to the back-up path. To every link $(i, j) \in A$ are associated two cost coefficients: c_{ij}^1 if the link belong to the nominal path, and c_{ij}^2 if the link belong to the back-up path.

Formulate the problem of finding the protected communication of minimal total cost.

Variante: How to modify the model in such a way to consider a possible node failure?

Exercise 11: Telecommunication network



- ▶ Lab sessions web site:
<http://www.elet.polimi.it/upload/gualandi/FRO-D>
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- ▶ Italian guide to AMPL:
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