Introduction to Optimization
MS&E 111/ENGR 62, Autumn 2007-2008, Stanford University
Instructor: Ashish Goel
Lab 4. Lab date - 11/9/07

Consider the "Telecommunications Routing Example" discussed in the file telco_example.pdf.

(a) Provide an LP which solves for the total maximum throughput of the network.

(b) What can we say about the integrality of the optimal solution(s) to this LP?

(c) Solve the problem in Excel.

(d) Suppose the information transmitted from source 1 to destination 1 has higher priority than that transmitted from source 2 to destination 2. Specifically, let us consider the case where we would like to optimize the throughput from source 2 to destination 2 plus four times the throughput from source 1 to destination 1. Modify the objective function to accommodate this. Run Solver again.

(e) Assume that information transmitted from source 1 to destination 1 continues to have higher priority, as specified in the previous part. But now, some changes have taken place in the network. Links (3,7), (8,10), and (9,13) have gone down. On the other hand, there are new links: (3,8) with a capacity of 4 and (8,13) with a capacity of 2. Finally link the capacity of like (8,11) has increased to 2 and link (10,13) to 4. Make the appropriate changes and run Solver again.