Linear and Integer Programming Project

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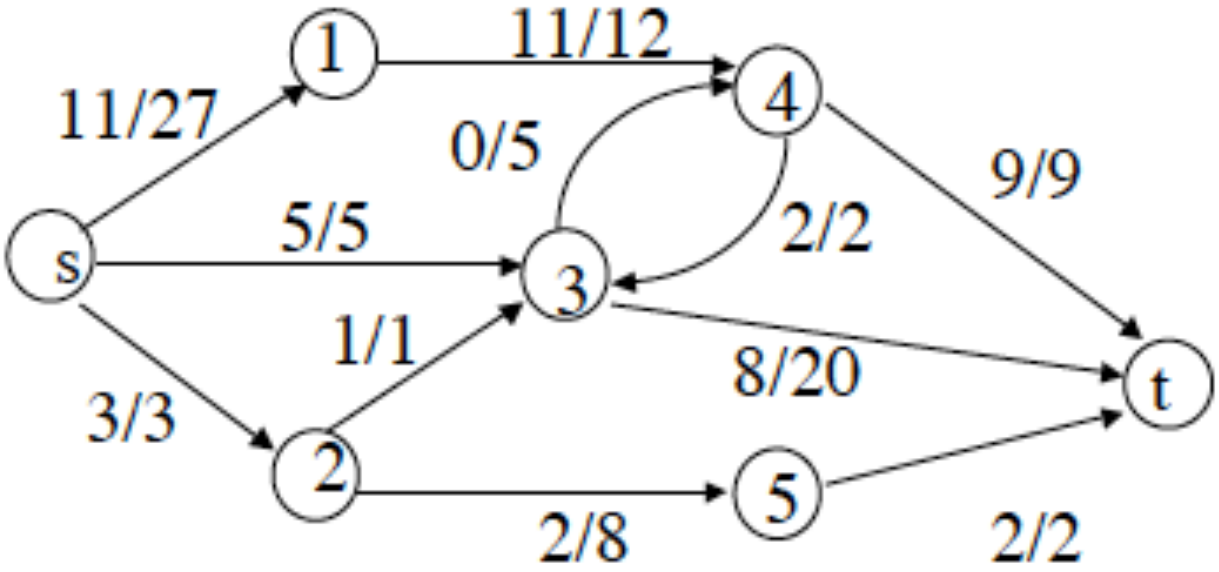
Fall, 2013

Problem 1: Network Flow

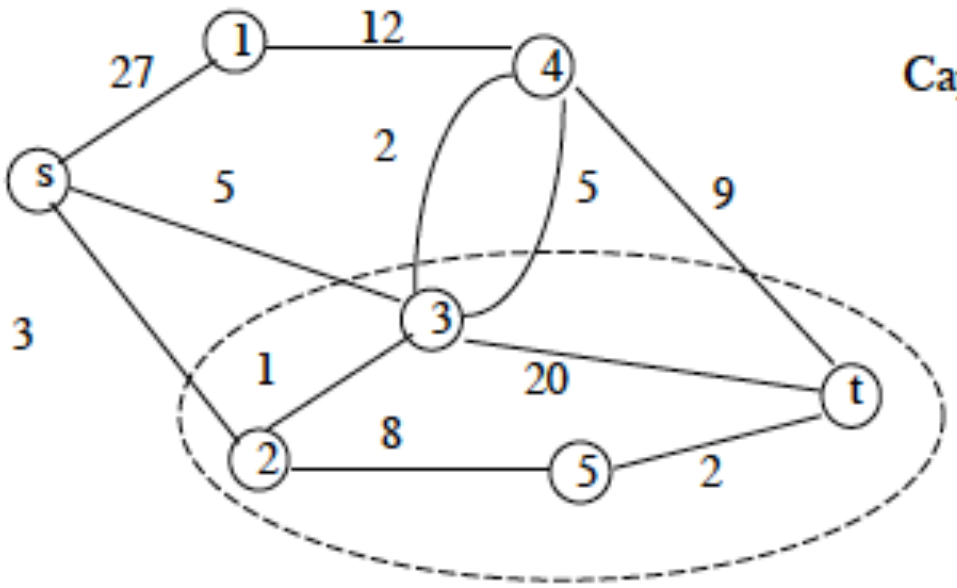
Network Flow on a Directed Graph



- Source(s) s, sink (consumers) t
- Capacity (bottom number)
- Flow (top number)
- Maximize flow from s to t obeying
  - Capacity constraints on edges
  - Conservation constraints on all nodes other than s,t

Problem 1: Min Cut

Min Cut Problem on a Undirected Graph



- Special nodes *s* and *t*
- Each edge *e* has capacity u_e. Set of edges S has capacity $\sum_{e \in S} u_e$
- Partition vertex set V into S,T where $s \in S$ and $t \in T$
- A cut is the edges (u,v) such that $u \in S$ and $v \in T$

Find a cut with minimum capacity

Discussions

- Use IP & LP to solve the network flow problem
- Use IP to solve the min-cut problem
- **Design algorithms (variables, objective, constraints)**
- Compare the results of IP and LP
- Implementation (language and tools)
- Evaluation of results
- Visualization of results
- Presentation of Plan (**Friday, Oct. 25**)
- Presentation of Results (**next Friday, Nov. 1**)