Office hours tomorrow: 11-12

PM due Friday

Board scholarships

Announcements

CS 314 - Network Flow
(classified report from 1950s)

Last week: Natural Flow
Key Theorem: Max Flow = Min Cut

\[ \text{Flows} \leq \text{Costs} \leq \text{Value} \]
A flow $f$ in a weighted graph $G$ and the corresponding residual graph $G_f$.

Tool: The Residual Graph

Flow \( Q \) of \( f \)
Given a problem, the main steps are:

- Max flow is useful in many applications.
- Turn it into a "flow graph".
- Get a routine.
- Solve the problem.
(directed)

Cover two vertices in a graph

Goal: Find the number of edge disjoint paths

Example: Disjoint Paths
Furture:

Put cascade $F$ on every edge.

How?
(repeat receipt)

Investigate why little. I have not done anything as yet. I have

must be done. Follow edge of length. I follow flow from flow point. I follow flow size. I follow size.

I follow flow size. I follow flow size. I follow flow size.

Original I lose to parts. I parts flow of size k. 

Gencefulness:
What about vertex disjoint paths?
Example: Brachistochrone
How?

ate...  

Scheduling: matches people to

Why?
Flows!

Construct a new graph: $|\text{edges}| \leq n/\!\!2$
Runtime:

$\mathcal{O}(mF) \ (FF)$

$\parallel$

$\mathcal{O}(n \cdot k \cdot \min(n, k))$
to get a flow.
edge in matching.

This for each

in matching send to flow along s-n, t along matching in original graph; for each edge in matching 

Consequence:
Q: Is there a feasible schedule?

Even though we are available for 3 vacation days, there is no doctor scheduled on many vacation days. Need a doctor scheduled on every vacation day.

Another assignment problem
Build a G. Put edge in G. Check that edge is not in a cycle. If it is, there is a flow. Start at u, end at v in G. Dijkstra's algorithm. Output is number of edges. Start at u, end at v in G. Dijkstra's algorithm. Output is number of edges.