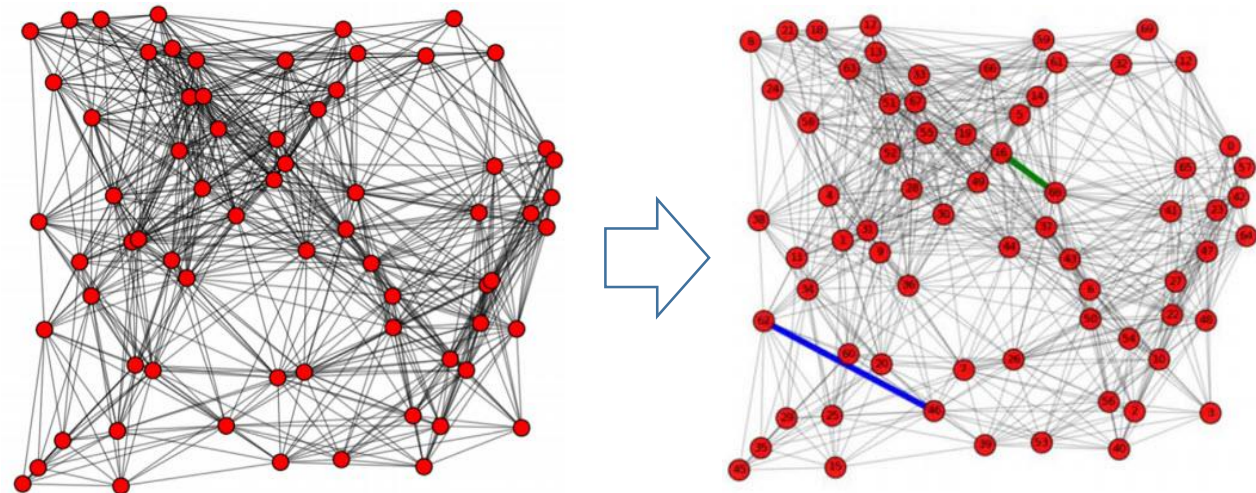
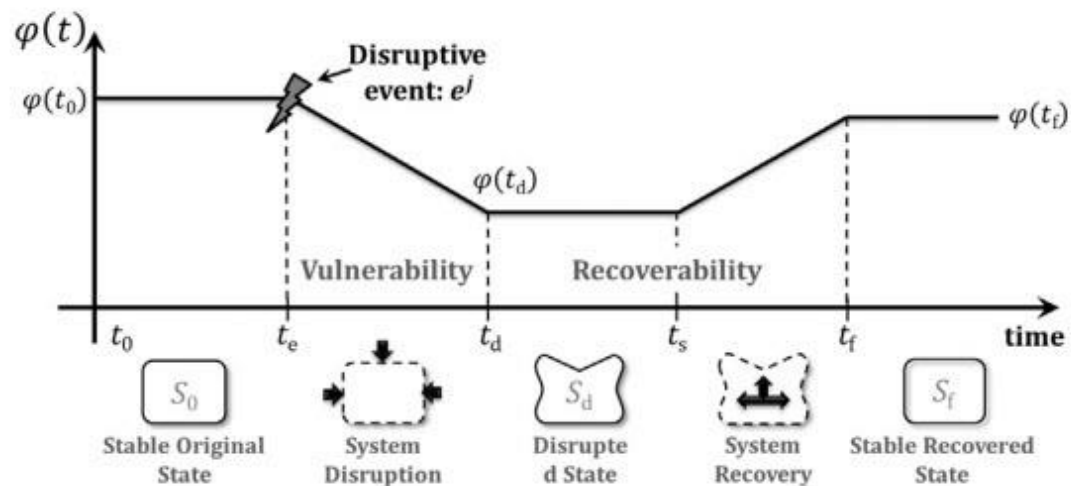
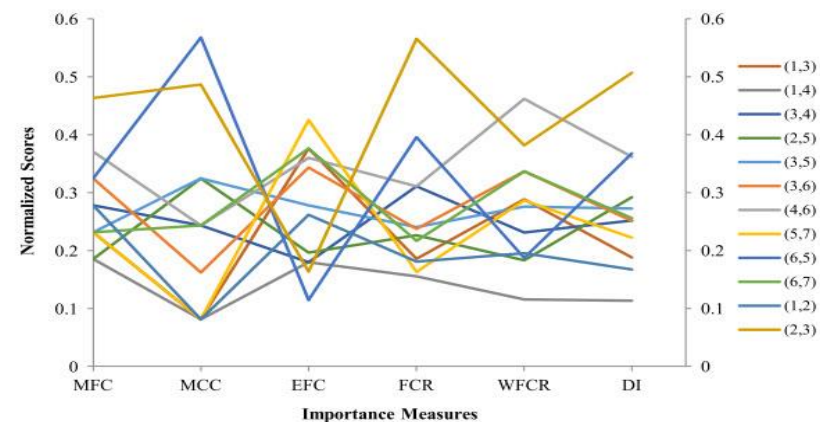
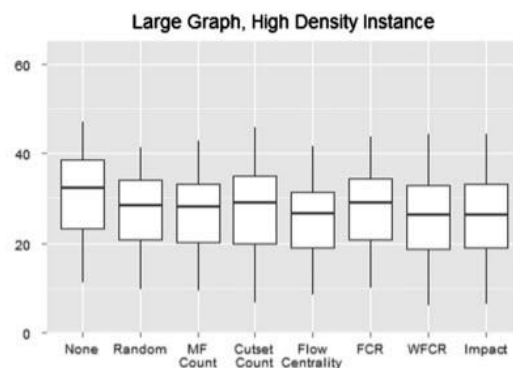
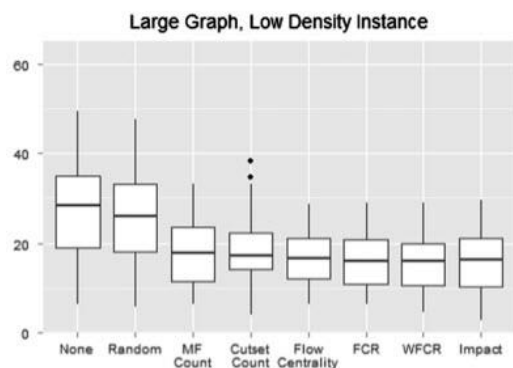
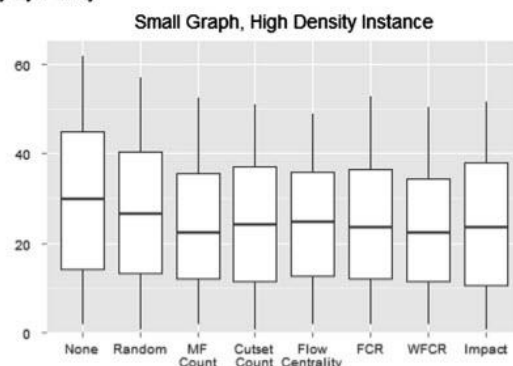
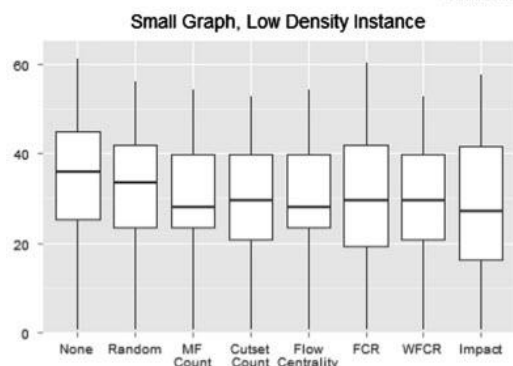


MIN-COST NETWORK FLOW PROBLEM EXAMPLES:

Maximum Flow Problem



Vulnerability by Policy



Policy	SGLD		SGHD		LGLD		LGHD	
	Mean	Max	Mean	Max	Mean	Max	Mean	Max
None	34.6%	61.2%	30.0%	61.7%	27.6%	49.5%	31.1%	46.9%
Random	32.4%	55.9%	27.2%	56.8%	26.0%	47.6%	27.7%	41.4%
MF count	29.6%	54.3%	24.3%	52.4%	17.7%	33.2%	27.5%	42.7%
Cutset count	28.9%	52.7%	24.3%	51.1%	18.1%	38.1%	27.9%	45.8%
Flow centrality	29.6%	54.3%	24.8%	48.7%	16.8%	28.6%	26.0%	41.4%
FCR	31.3%	60.2%	24.8%	52.7%	15.9%	28.8%	28.4%	43.8%
WFCR	28.9%	52.7%	23.6%	50.4%	15.6%	28.9%	26.0%	44.4%
Impact	29.6%	57.6%	24.2%	51.4%	15.6%	29.6%	26.2%	44.4%

rerouting airline passengers example

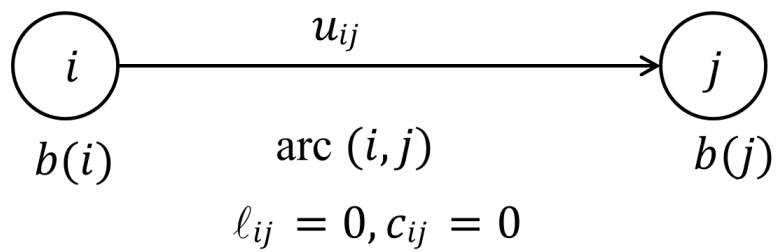
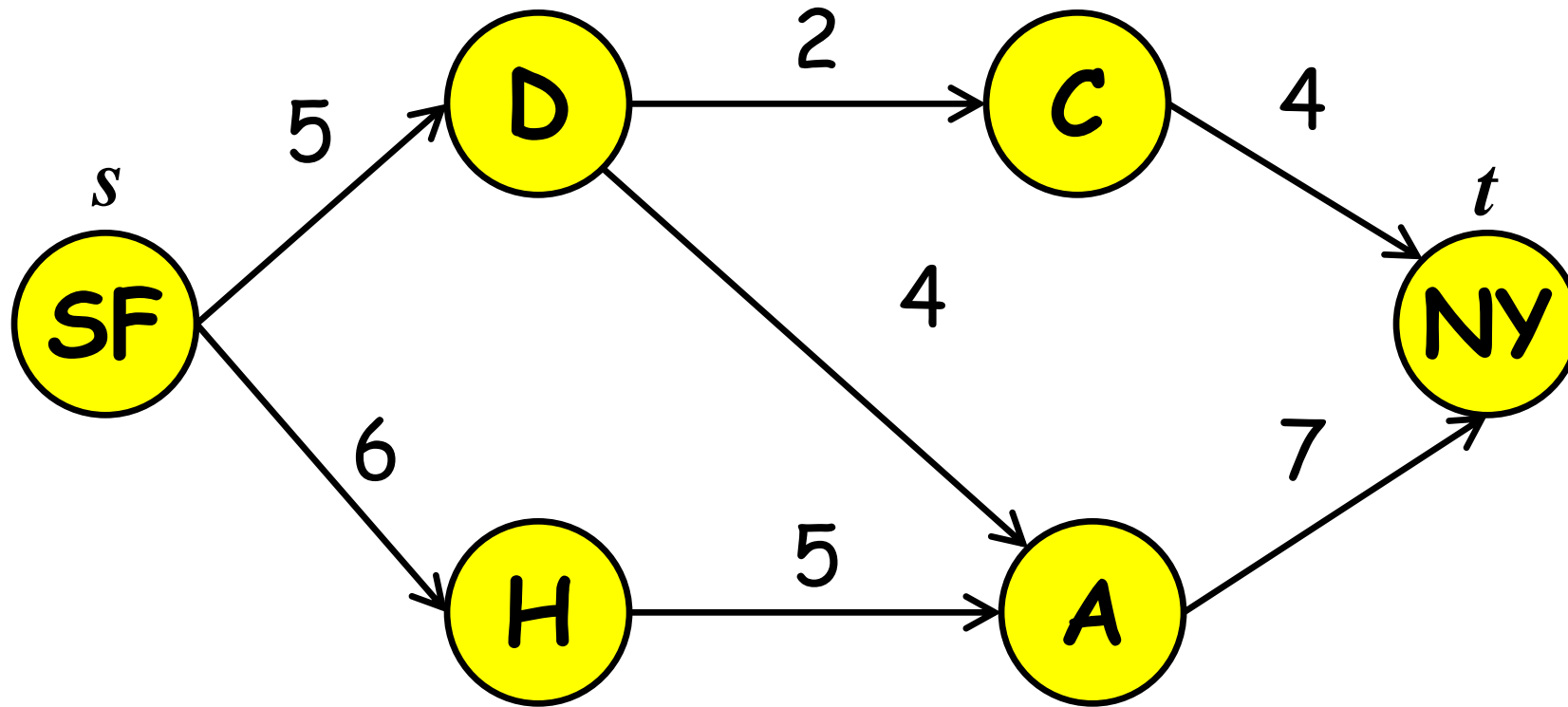
Due to a mechanical problem, Fly-By-Night Airlines had to cancel flight 162 - its only non-stop flight from San Francisco to New York.

Formulate a maximum flow problem to reroute as many passengers as possible from San Francisco to New York.



Flight	From	To	# of seats
160	San Francisco	Denver	5
115	San Francisco	Houston	6
153	Denver	Atlanta	4
102	Denver	Chicago	2
170	Houston	Atlanta	5
150	Atlanta	New York	7
180	Chicago	New York	4

network representation

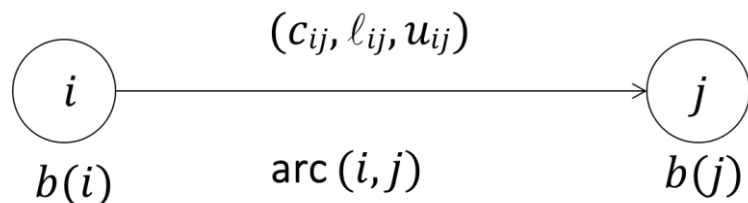
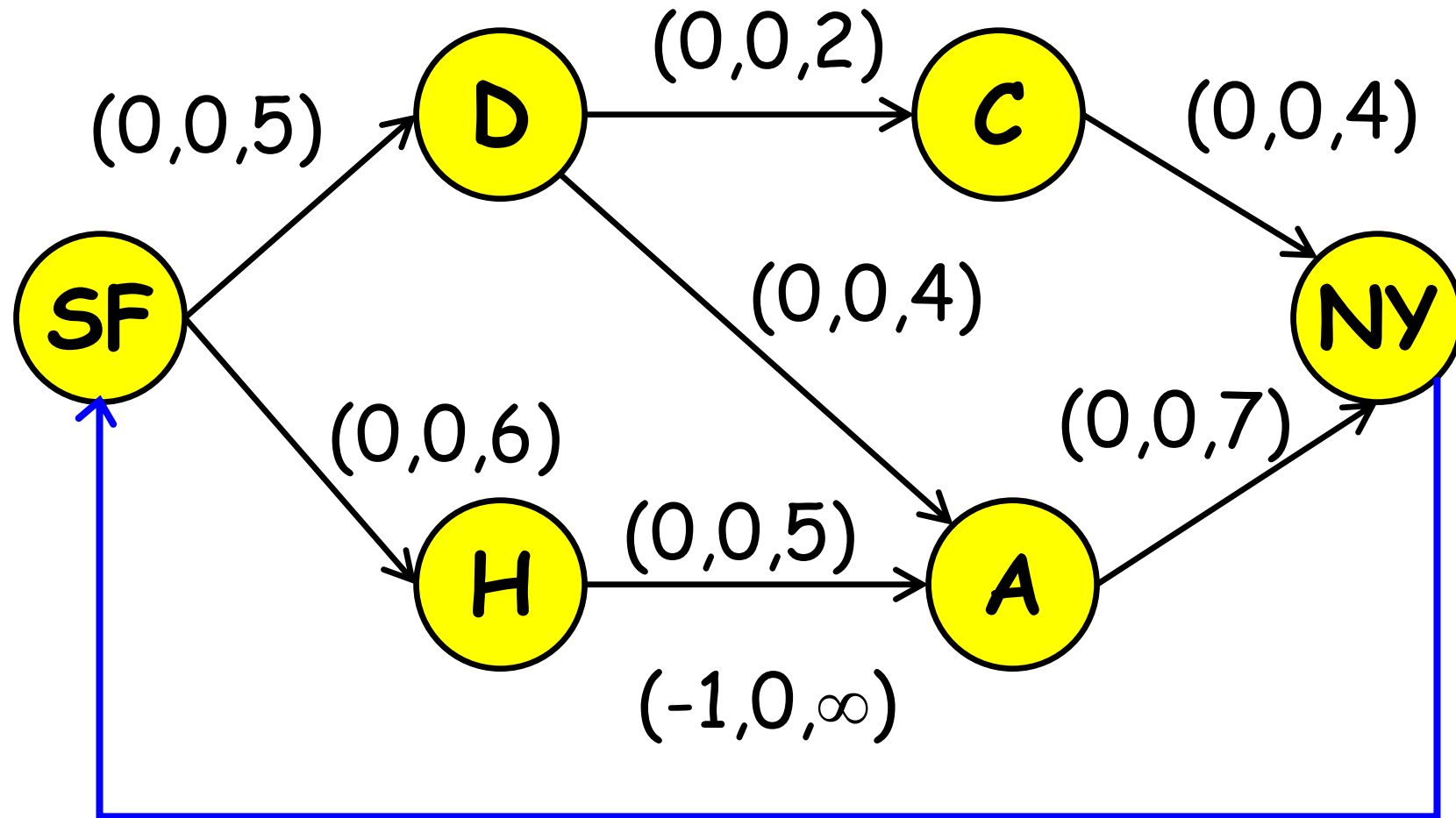


MCNFP formulation of maximum flow problem

1. Let arc cost = 0 for all arcs
2. Add an arc from t to s
Give this arc a cost of -1 and infinite capacity
3. All nodes are transshipment nodes

“Circulation Problem” formulation

formulation of maximum flow problem as MCNFP



optimal solution

