

Network Flow

- Maximum Flow: Problem Formulation
- Maximum Flow: Upper Bound
- Maximum Flow: Adding flow along paths
- Residual Network and Augmenting Path
- Ford-Fulkerson Algorithm – Max-Flow-Min-Cut Theorem
- Edmond-Karp Algorithm
- Maximum Flow: Variants and Applications

IMDAD ULLAH KHAN

Multiple Sources and Sinks: Multi Commodity Flow

- s_1, \dots, s_o and t_1, \dots, t_p
- Introducing a dummy source (and/or a dummy sink) node
- Connected it to each original source s_i by an edge with capacity equal to $c(\{\{s_i\}, \{\bar{s}_i\}\})$
- Why this should be the capacity of this edge?

Non-Integral Capacities

- The FF algorithm could be arbitrarily slow
- Rational numbers can be handled by multiplying all numbers with their LCM but real numbers are trouble
- We need to use a non-augmenting paths based algorithm

Other Variants

- The circulation problem
- Min Cost Flow

Max Flow : Applications

There are a lot of applications of the maximum flow problem and its variants. Please go through the book chapter and read about the following applications

- Bipartite Matching
- Image Segmentation
- Survey Design
- Disjoint Path
- Project Selection
- Baseball Elimination