Introduction:

Minimum cost maximum flow problem

* Job scheduling in hpc
* Covid problem with oxygen shortage

Modeling the problem:

* Factories are source nodes
* Hospitals are sink nodes
* Each source node has some capacity
* Each sink node has some demand
* Cost is the time/money required to reach from a source to sink

Two different versions of the problem:

* Net demand = Net supply
* Net demand != Net supply

Algorithms:

* Cycle canceling
* Linear Programming – network simplex

Week-wise:

1st – Understanding problem

2nd – Modeled problem

Till 30 may – understand

Till 7th June – Modeling problem – AIIGMA – distance API, Networkx

Till 14th June –

Both are exactly the same!

1. Maximum Flow – Ford-fulkerson and Edmonds-karp:

Ford Fulkerson is the main – uses DFS – O(EF)

Edmonds karp – BFS for augmenting paths – O(VE2)

Residual capacity – capacity-flow

Search for a path from source to sink. Take bottleneck value and add it to the flow and reduce residual capacity

Do this until no augmenting path can be found

2. Successive shortest path algorithm:

3. Cost scaling:

4. Network simplex:

Paths:

1. implement own algorithm from scratch

2. Prallelize push relabel as you have the code

3.