Maximum flow

[intro]

Find a max flow from the source s and the sink t in the graph G=(V,E).

[rule]

1. capacity law.

The flow must <= the current capacity.

1. conservation law.

Flow in = Flow out.

[concept]

1. Left edge:

Capacity is returned by the flow.

[algorithm]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Algorithm | analogy | Time complexity | Comment | Note |
| Ford-Fulkerson algo | DFS |  | NP time | Y |
| Edmonds-Karp algo | BFS |  | P time | Y |
| Dinic algo | BFS + residual graph |  | P time | N |
| General Push relabel algo |  |  | P time | N |

[step]

1. Find a simple path named p.
2. Find edge with min capacity and fill all edges in the path with the capacity named (u,v).
3. Build new network.

(Just change two things

(1) For the edge (u,v), plus the capacity

(2) For all edges does NOT belong to (u,v) in path p, subtract the capacity.)

1. If there is a path in the new network. Jump to step 1.

[application]

1. Bipartite matching

[ref]

[[101北一資訊集訓] 08 Max Flow 最大網路流 - YouTube](https://www.youtube.com/watch?v=U6SCE4MTC_Q)