Dinic's Algorithm

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Algorithm (Dinic): Start with zero flow. And repeat blocking step until exists augmenting path (target is reachable in the actual layered network).

Blocking step: Find blocking flow f' in the layered network L defined by the current flow f.
Set $f' := f + f'$, which is defined $(f + f')(x, y) = f(x, y) + f'(x, y)$.

How to find a blocking flow? Start with zero flow and go to initialization.
Let x is the current vertex and p is the augmenting path from source to x

Initialization: Set $p := [s]$ and $x := s$. And go to forward.

Forward: If $\nexists y \in V_L : (x, y) \in V_L$ than go to backward.
Else takes any edge (x, y), "$p = p + y$" and $x = y$ (new actual vertex).
If $y \neq t$(target) than repeat forward else if $y = t$ go to increase.

Backward: If $x = s$ end (does not exist augmenting path form s to t).
If $x \neq s$ then do this: let (v, x) is the last edge in p. Remove x from p and remove the edge (v, x) from L.
Set $x = y$ (new actual vertex) and go to forward.

Increase: Let $d = \min\{c(x, y) - f(x, y) | (x, y)$ is the edge in $p\}$.
Add d to flow at all the edges of the path p, remove from L all saturated edges. Go to initialization.