

Sep 25

THEOREM: For all $G=(V,E)$, start vertices $s \in V$, $R^* = CC(s)$

Ex. P.F. by induction

Lemma 1: $R^* \subseteq CC(s)$

Lemma 2: $CC(s) \subseteq R^*$

Ex. Lemma 0: Explore always terminates

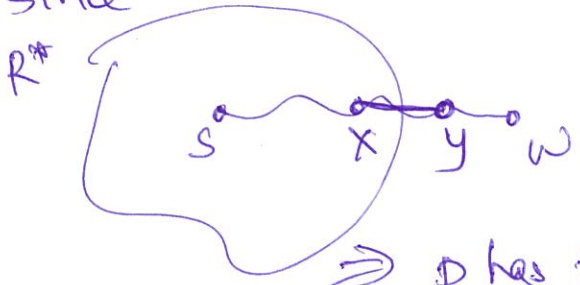
Pf (idea) of Lem 2: Pf by contradiction

Assume $CC(s) \not\subseteq R^*$

$\Rightarrow \exists w \in CC(s)$ s.t. $w \notin R^*$



Since $w \in CC(s) \Rightarrow \exists$ s-w path P



But: (1) P starts inside of R^* ($s \in R^*$)

(2) P ends up outside of R^* ($w \notin R^*$)

$\Rightarrow P$ has to "cross the boundary" of R^*
 $\equiv \exists (x,y) \in E$ s.t. $x \in R^*$ but $y \notin R^*$

by Algo defn Explore should have added y to R

\Rightarrow Explore shouldn't have terminated (without adding y to R^*)

\Rightarrow Contradicts Lem 0