Kuhn's Theorem

Proposition

Every finite extensive game with perfect information, $\Gamma = \{N, H, P, (\succeq_i)\}$, has a subgame perfect equilibrium.

- If $l(\Gamma(h)) = 0$ define $R(h) = h$.
- Let $R(h)$ be defined for all $h \in H$ with $l(\Gamma(h)) \leq k$ for some $k \geq 0$.
- Let h^* be a history for which $l(\Gamma(h^*)) = k + 1$; let $i = P(h^*)$.
- $l(\Gamma(h^*)) = k + 1 \Rightarrow l(\Gamma(h^*, a)) \leq k$ for all $a \in A(h^*)$.
  - Define $s_i(h^*)$ to be a $\succeq_i$-maximizer of $R(h^*, a)$ over $a \in A(h^*)$
  - Define $R(h^*) = R(h^*, s_i(h^*))$.
- This process defines a strategy profile s in Γ; by the one-shot deviation property, s is a subgame perfect equilibrium of Γ.