Horn Minimization

An overview of some existing algorithms

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HSE - ISIMA

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Closure operator and systems

1.1 - Elements of set theory

Set Σ of attributes. A map $\varphi : 2^{\Sigma} \longrightarrow 2^{\Sigma}$ is a *closure operator* if, $\forall X, Y, Z \subseteq \Sigma$:

- $X \subseteq \varphi(X)$ *(increasing)*
- $X \subseteq Y \longrightarrow \varphi(X) \subseteq \varphi(Y)$ *(isotone)*
- $\varphi(\varphi(X)) = \varphi(X)$ *(idempotent)*

Some details :

- (Σ, φ) is a closure space,
- X is *closed* if $X = \varphi(X)$,
- Σ^{φ} set of closed sets : *closure system*.

Closure Example

1.1 - Elements of set theory

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- Directed graph $G = (V, E)$.
- *Closure* $\varphi(X)$ of $X \subseteq V$: all the reachable vertices starting from X.
- $\varphi(\{A, B\}) = \{A, B, C, D\}$.
- $\varphi(\{F\}) = \{F\}$, $\{F\}$ is *closed*.

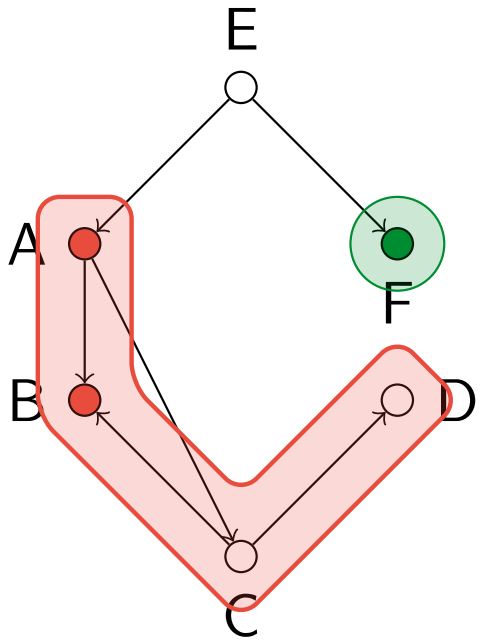

FIGURE – Closure of a vertex in a directed graph

Notations

1.1 - Elements of set theory

title
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2.1 - early 80s

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3.1 - Pouf

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3.1 - Pouf