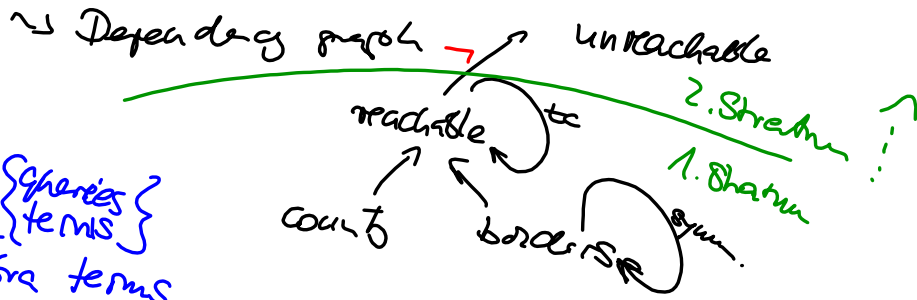


DataLog : Stratification "wait"



$\hat{=}$  SQL terms  
 algebra terms  
 hierarchical views

⇒ always acyclic directed graph

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Consider aggregation in DataLog :  
(needs also stratification)

⇒ predicate syntax .....

using Polys/DataLog lists (set, bag, ...)

SQL: functional syntax

select sum (population) as s  
from city

$\hat{=}$   $s := \max\{p\}$

DataLog: predicate syntax

Sum(S, L) :- ..... ?

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Cyclic negative dependencies:

$$p \leftarrow \neg q$$

$$q \leftarrow \neg p$$

$\rightarrow$  not stratifiable

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ex. 608  $p(b) :- \neg p(a)$

Dep graph:  $p \rightarrow \neg$

"locally stratified"  $\rightarrow$  ground instances

$\Rightarrow$  "intended" model:  $\{p(b)\}$  (and  $\neg p(a)$ )

Minimal models:  $\{p(b)\}$   
 $\{p(a)\}$

$\rightarrow$  no reason to believe in  $p(a)$   
 $\rightarrow$  closed world,  $\neg p(a)$  holds  
 $\rightarrow$  believe that  $p(b)$  holds  
 "well-founded argumentation"

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- 1)  $w$  —  
 $\neg w$   $f, k, n, j$
- 2)  $w$   $a, b, i$   
 $\neg w$   $(f, k, h, j)$   
 $e,$
- 3)  $w$   $d$   
 $\neg w$   $e, m$
- 4)  $w$   $c$

$\Rightarrow$  for  $m, h, g$ , neither  $w_m(\cdot)$  nor  $\neg w_m(\cdot)$  can be derived

Let  $\mathcal{K} = \{w_m(a), w_m(b), w_m(i), w_m(d), w_m(c)\}$

$\mathcal{K} \models P$ ? No:  $\mathcal{K} \not\models P$  since  $w_m(h) \leftarrow w_m(h, m)$  would be required  
 $\neg w_m(h)$

$\Rightarrow$  extend  $\mathcal{K}$  to a model by "inventing"

$\mathcal{K}' = \mathcal{K} \cup \{w_m(h)\} \models P$

Consider  $\mathcal{K}'' = \mathcal{K} \cup \{w_m(m)\} \not\models P$

$\mathcal{K}''' = \mathcal{K}'' \cup \{w_m(g)\} \models P$  because  $w_m(g)$  would be required!

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