Relational Domain Calc (Example)

$F(N, C, A) :-$

$\exists G_P, P, x_0 :$

$\text{Comp}(N, C, G_P, x_0, A, P)$

$\wedge\ P > 100\,000\,000$

$\wedge\ \neg \exists Perc : \varphi_{\text{Components}}(C, \text{'Asia'}, Perc)$

Nov 13-10:10

Outlook Datalog

head(A, B, C) :- body(A, B, C, D, E, F)

⋮ ⋮

$\Rightarrow$ rules + Conj queries/bodies

- recursive Datalog $\hat{=}$ SQL3++C
- nonrecursive Datalog $\hat{=}$ Alg, SQL

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Rel Tuple Calc for Slide 429

$$\{ o.abbrev : Organization(o) \wedge \neg \exists cont : (continent(cont) \wedge \exists i,e : (ismember(i) \wedge encompasses(e) \wedge i.country = e.country \wedge e.continent = cont.name \wedge i.org = o.abbrev)) \}$$

$$\Leftrightarrow \{ o.abbrev : Organization(o) \wedge \forall cont (continent(cont) \rightarrow \exists i,e : (\ldots\ldots)) \}$$

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R	
A	B
1	a ✓
1	b ✓
2	b ✓
2	c
3	a

T
A
1
2
.

$R \div T$ = { a, b, c } ✓

Signature [B]

all R B values that occur in R with each A-value of T

Nov 13-11:15

Give me all numbers that are not country populations

Query stated in a wrong way

$F(CP) = \exists\, CN, CC, CA :$

$\neg\, \text{Country}(CN, CC, CA, CP, \_, \_)$

Pop. Germany : 83 500 000

for the above: set CN = 'Alice'
CC = 'X'
CA = ~

⇒ satisfies the above query → possible answer would be 83 500 000

⇒ Next try

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$F(CP) :- \neg \exists\, CN, CC, CA, \ldots :$

instead: activeDomain of DB! Country(CN, CC, CA, CP, _, _)

all $d \in \mathcal{D}$ such that d does not occur as country pop in the DB

∧ CP is a number

CP/1, ... 83 500 000 is not an answer since we have Country(Germany, D, _, 83500000)

, ... 10 000 000 000, 10 000 000 001, ... are answers,

but also CP/'X', CP/'Alice' are answers if they are contained in $\mathcal{D}$

Nov 13-11:25

Sl 433

$F(x) = person(X) \wedge \neg married(John, X) \wedge \neg(X = John)$

$\Rightarrow$ possible Binding of X

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