



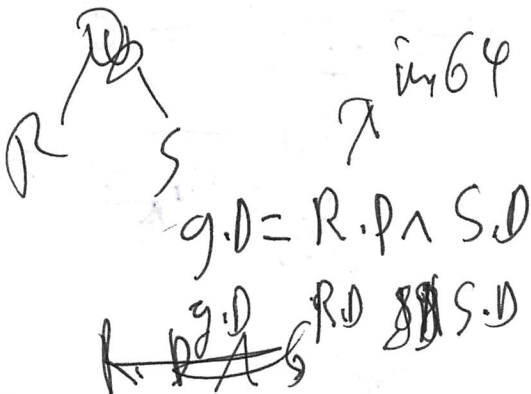
$Q' =$

prod. (Q)





The Order of the Stick™



MEDIC!!





The Order of the Stick™



$U_1 \dots U_3 \equiv \text{atx} \nu Q$

$\nu \nu P$

$Q = UCA$

$UCQA$

$\Sigma \text{Nxi} Q$

MEDIC!!





The
Order of the Stick™



R U S
A B BC

$X_1 X_2 + X_3 X_4$

A $X_1 X_2$
A $X_3 X_4$



R.A75

g.p = R.AA ~~Q~~ R.D

Mimir

create & destroy "

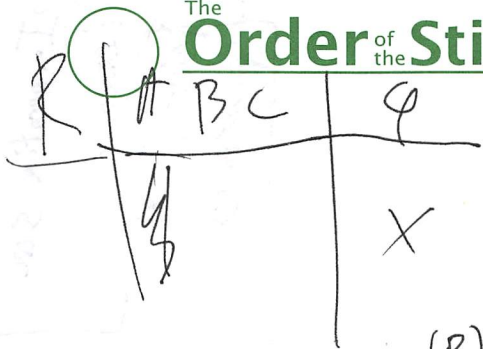
write

the gms ip? :

GPROM

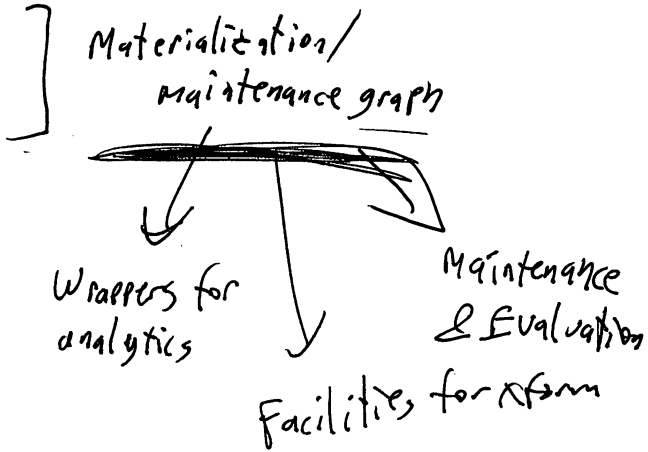
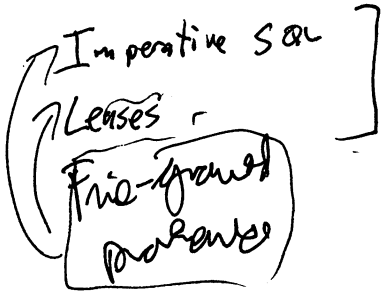
DB

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$f(A)^{g(B)}$ e.g. ISNULL





Usability

Communicating uncertainty to end users

Justifications in the last mile

Self-Justifying recommender systems

Justified Data Repair



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Human

~~Papers~~
~~Inst~~

written

- Rewriting Queries for metadata
- Presenting Uncertainty

- provenance for curation?

MEDIC!!





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(R / C)
/ or
(R, C)





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$v_1 \dots v_n \equiv \begin{matrix} \equiv \\ N \\ \text{VQ} \\ \text{MXJ} \end{matrix}$



Exec Model
Vizier Visual script

(generate RA tree)
Re-enactment
"life"

Enforce
sort
&
display
output
~~SQL~~

RA tree (w/ uncertainty)
tprov

Mimir

(replace UGTerms)
decorate Probs



Translate
to uncertainty
aware
operator

RA tree (w/ provenance)

Gprom
(generate instrumented
query)

Relational
encoding of
IA

Instrumented SQL (clean SQL)
DB

DB



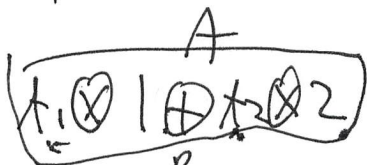
The
Order of the Stick™



$$\sqrt{\text{num}(A)} = 15$$

$$\text{num}(A), b$$

R



B



- Explain Cell/Row
- Recover Formula
- Sort Orders
- ~~Offset~~ Offset Formulas in Update
- Coordinate System