Jakob Fridesjö
Umeå universitet

1. Give ids of clients who visited every website owned by Ving (tuple calculus using ∀)

$\{x.client \mid Visits(x) \text{ AND } Page(y) \text{ AND } (\forall y)(y.owner='Ving' \text{ AND } x.page=y.id)\}$

2. Give ids of clients who visited every website owned by Ving (tuple calculus using ¬∃)

$\{x.client \mid Visits(x) \text{ AND } Page(y) \text{ AND } (\neg\exists y)(y.owner!='Ving' \text{ AND } x.page!=y.id)\}$

3. Give ids of clients who visited every website owned by Ving (basic relational algebra including ÷)

$R_1 := \pi_{id}(\sigma_{owner='Ving'}(Page))$
$R_2 := \rho_{S(page=id)}(Visits) \div R_1$
$R_4 := \pi_{client}(R_2)$

5. Give ids of clients who visited every website owned by Ving (extended relational algebra using γ)

$R_1 := \sigma_{owner='Ving'}(Page)$
$R_2 := \pi_{vingpages}(\gamma_{Count(id) \to vingpages}(\pi_{id}(R_1)))$
$R_3 := \delta_{(client,page)}(Visits \bowtie_{Visits.page=Page.id}(R_1))$
$R_4 := \gamma_{Count(client)\to visitcount}(R_3)$
$R_5 := \pi_{client}(\sigma_{visitcount=vingpages}(R_3 \times R_4))$

6. Owners with more than 10 pages (extended relational algebra)

$R_1 := \gamma_{owner,Count(id)\to numpages}(Page)$
$R_2 := \sigma_{numpages>10}(R_1)$
$R_3 := \pi_{owner}(R_2)$

7. Give the owner and total number of visits to pages owned by the owner for each owner and rank from most popular to least popular (extended algebra)

$R_1 := Page \bowtie_{Page.id=Visits.page} Visits$
$R_2 := \gamma_{owner,Count(timestamp,client)\to numvisits}(R_1)$
$R_3 := \pi_{owner,numvisits}(R_2)$
$R_4 := \tau_{numvisits}(R_3)$

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8. Repeat 7, but let owners who have no pages with visits also be included in the report

$R_1 := \text{Page} \bowtie_{\theta\ \text{Page.id=Visits.page}} \text{Visits}$
$R_2 := \gamma_{\text{owner,Count(timestamp,client)->numvisits}}(R_1)$
$R_3 := \pi_{\text{owner,numvisits}}(R_2)$
$R_4 := \tau_{\text{numvisits}}(R_3)$