SL: 452: Algebra

⇒ self-contained subexpressions

→ allow bottom-up evaluation/semantics

→ also needed for Datalog

↳

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Datalog

- up to now: conjunctive queries

$T(\ldots) :- atom_1, atom_2, \ldots, atom_n.$

Consider non-atomic subqueries

head ← $atom_1 \wedge subq_1(\ldots) \wedge subq_2 \wedge \ldots$

bottom up idea

$(sq_3 \vee sq_4)$ view$_1$

$\exists X: (subq_2)$ view$_2$

e.g.

$V_1(\ldots) :- sq_3$

$V_1(\ldots) :- sq_4$

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Example

* all country codes and org.abbrevs, s.t.
  - country is a member in org
  - or country ≥ 10.000.000 inhabitants
  - org established before 1990

SQL:

```
select i.country, i.organization
from ismember i
where exists (select * from country c
      where c.code = i.country and c.population >= 10000000)
or  exists (select * from organization o
      where o.abbreviation = i.organization and established < '01-JAN-1990')
```

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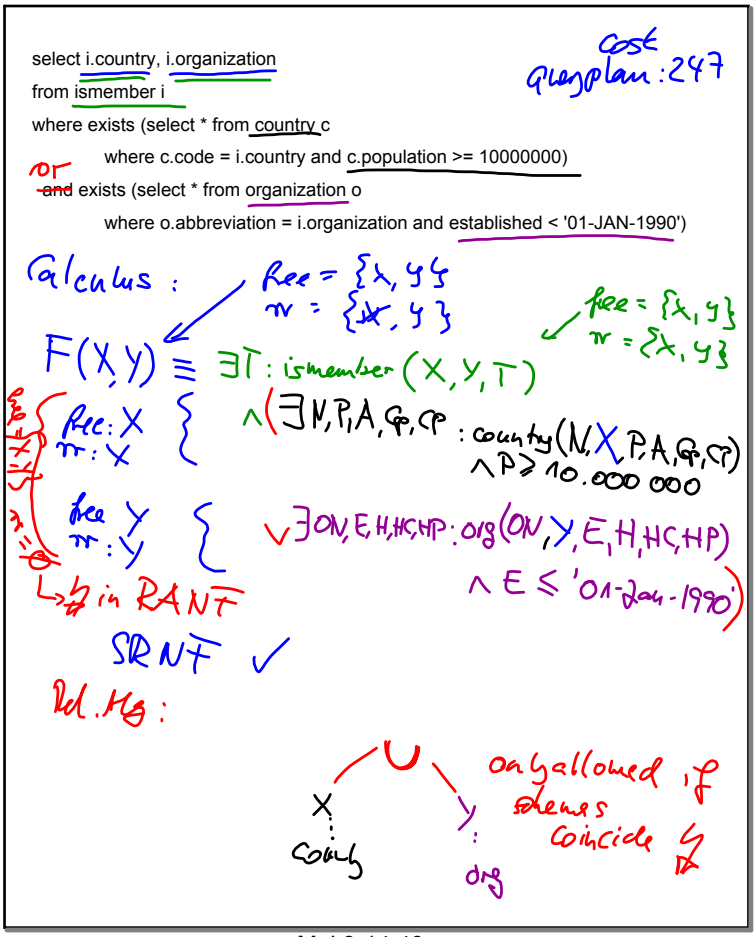

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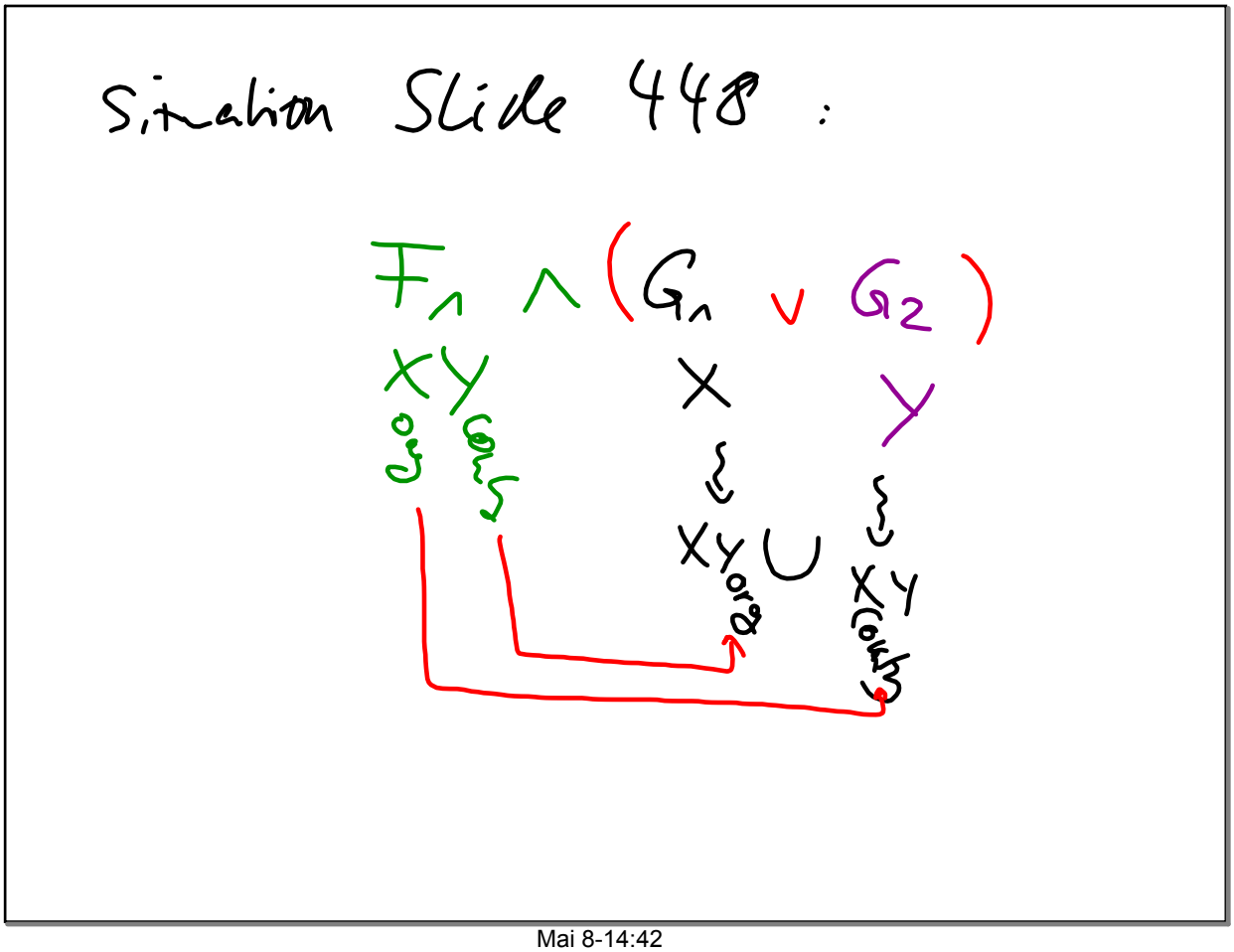
Situation Slide 448 :



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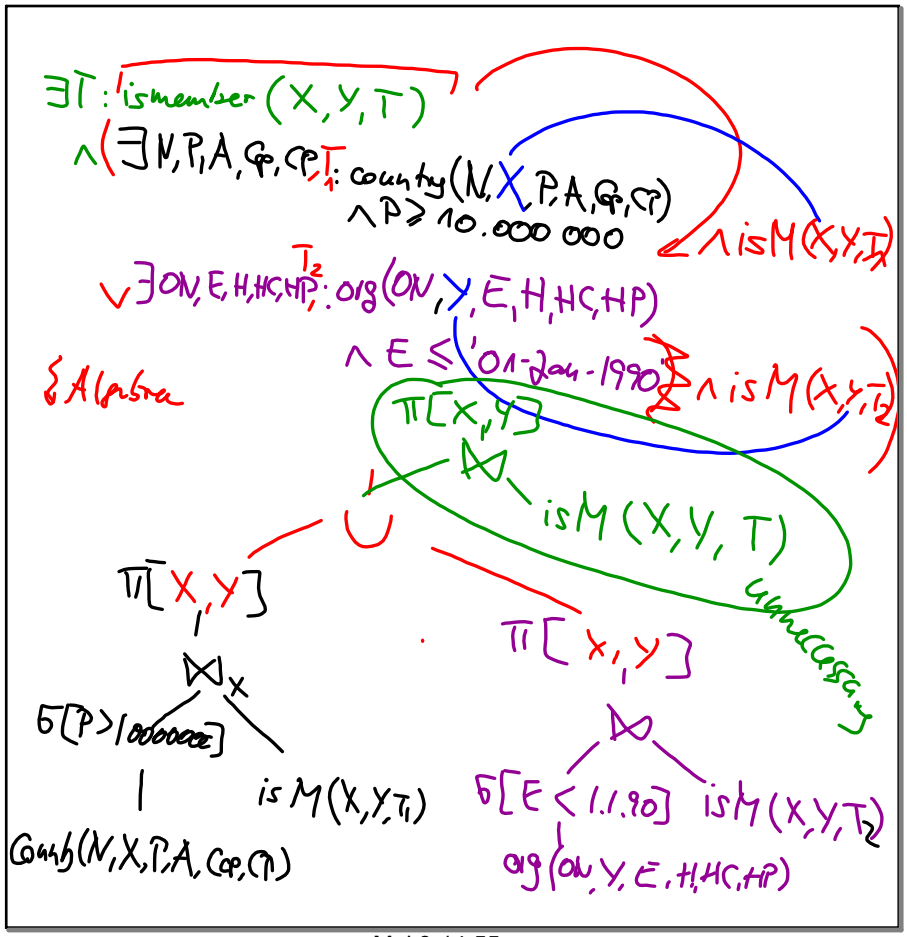

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query plan: cost 26

```
(select c.code , i1.organization
 from country c, ismember i1
 where c.code = i1.country and c.population >= 10000000)
  union
(select i2.country , o.abbreviation
 from organization o, ismember i2
 where o.abbreviation = i2.organization and established < '01-JAN-1990')
```

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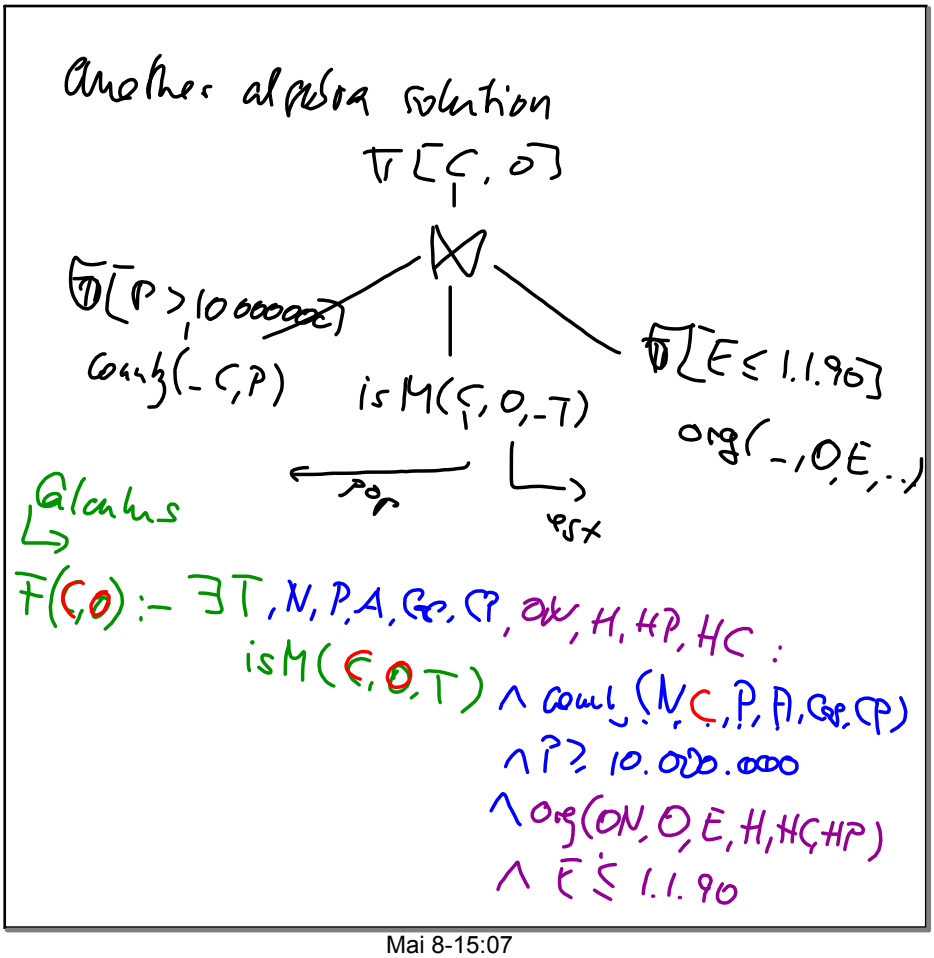

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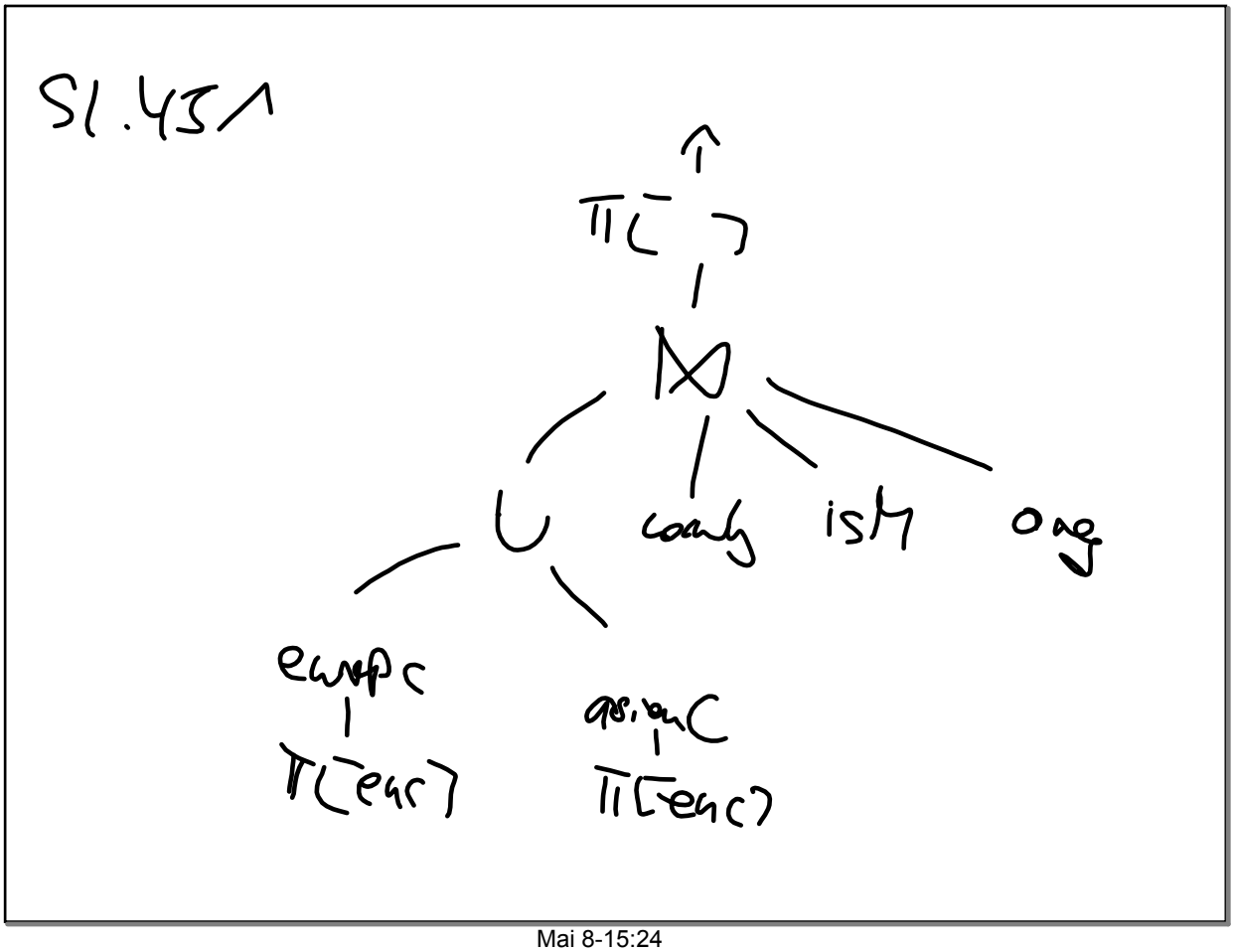

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