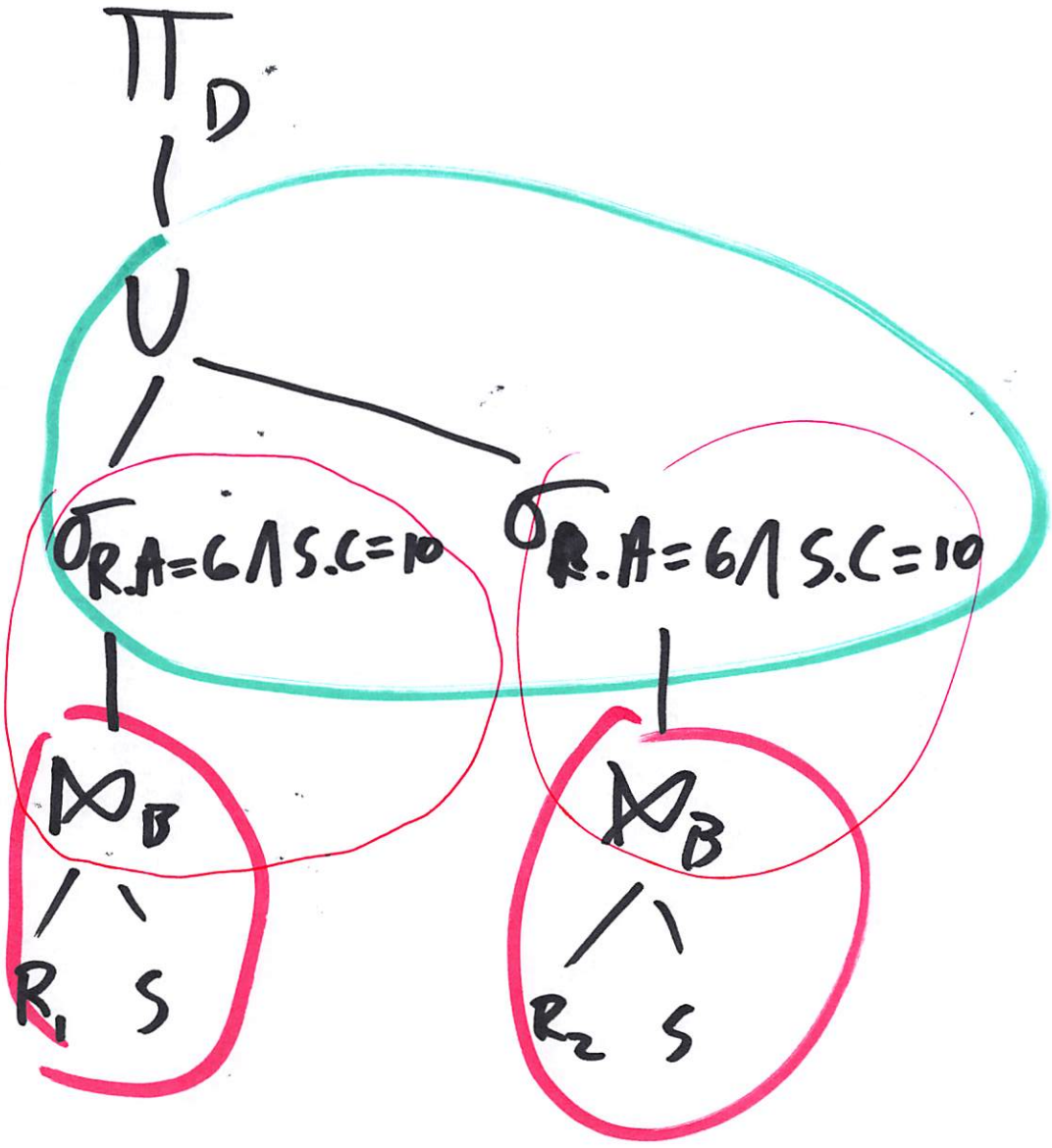
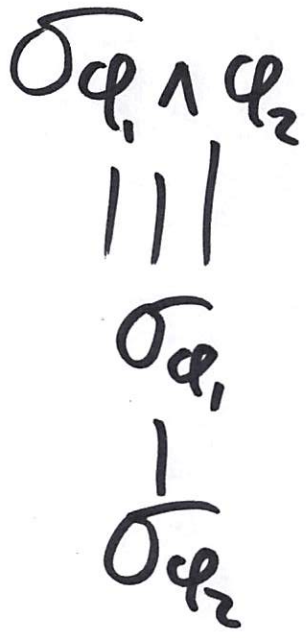
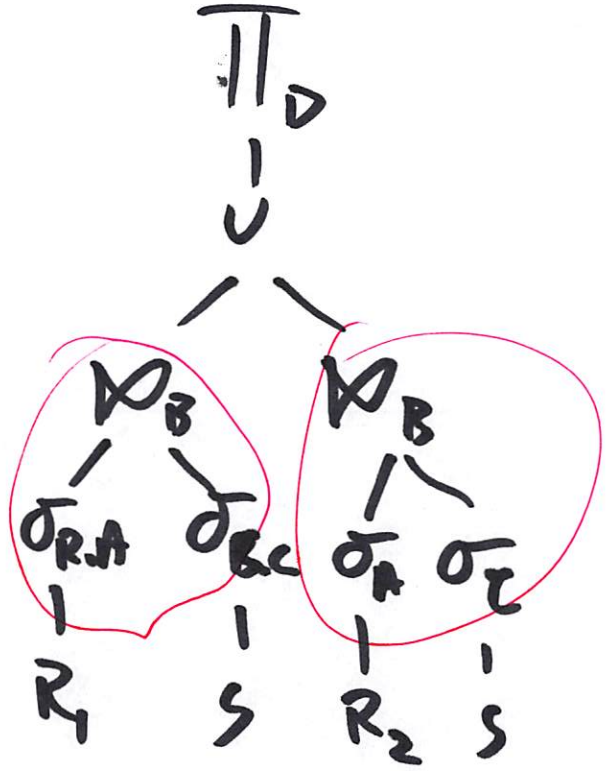
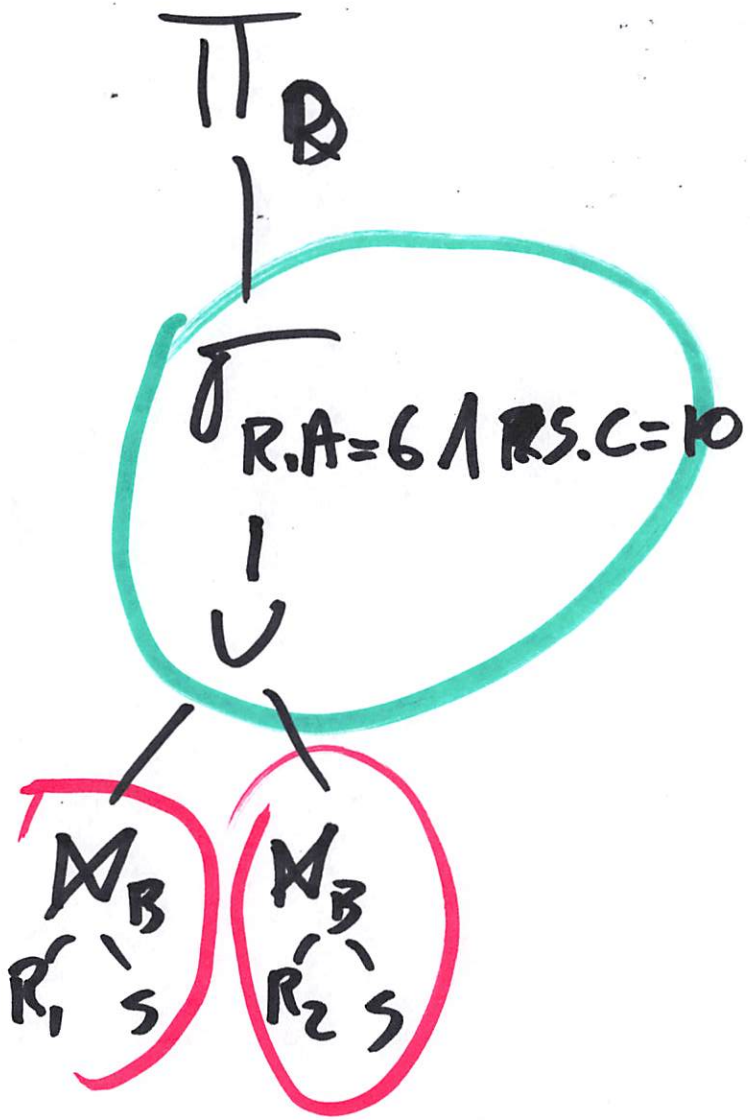
Midterm 2 Review


Π_D
$\cup$
$\sigma_{R.A=6 \wedge S.C=10}$
$\sigma_{R.A=6 \wedge S.C=10}$
$\bowtie_B$
$\bowtie_B$
R_1
S
R_2
S

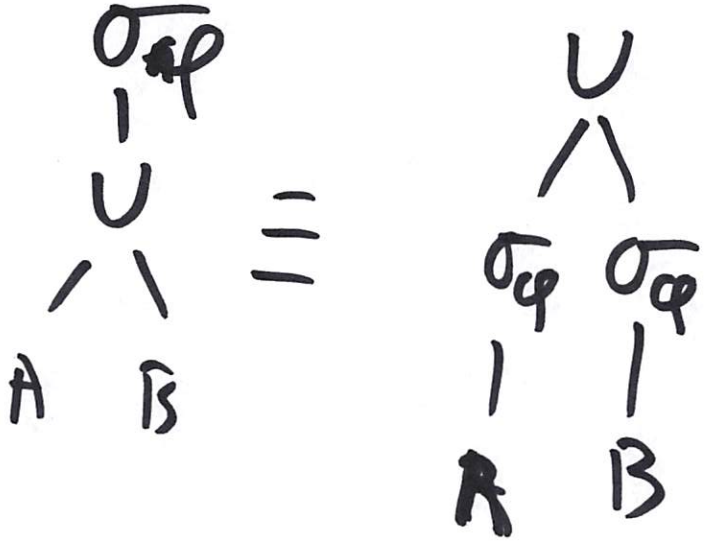

$\sigma_{\varphi_1 \wedge \varphi_2}$
σ_{φ_1}
σ_{φ_2}


Π_D
$\cup$
$\bowtie_B$
$\bowtie_B$
$\sigma_{R.A}$
$\sigma_{B.C}$
σ_A
σ_C
R_1
S
R_2
S



$R_1(A,B)$ $S(B,C,D)$

$R_2(A,B)$



$|R|$ = # of tuples

p = # of tuples per disk page

t = # of keys per tree index page (not data page)

b = # of tuples per buffer block (or bucket)

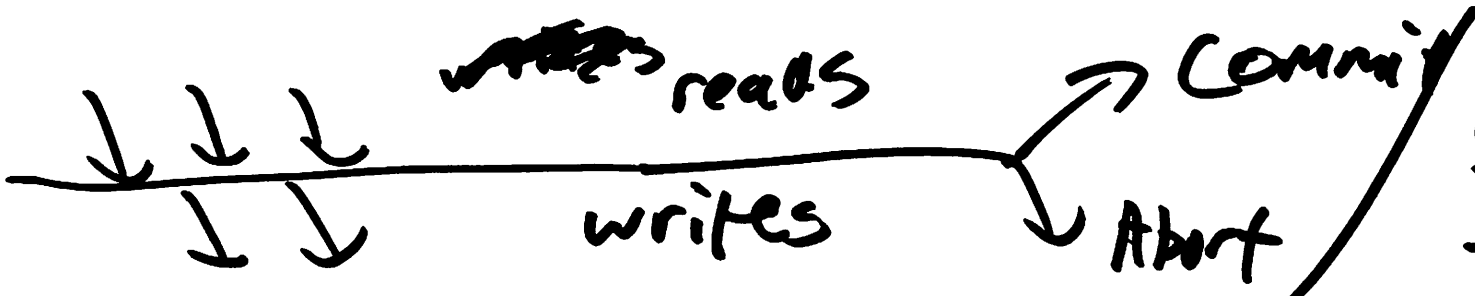
Sel = Selectivity

φ has selectivity s

where $s = \frac{|\sigma_\varphi R|}{|R|}$

Metrics: - Memory
- CPU cost
- IO cost

$$\forall \text{tuples in } S \quad \underbrace{|\sigma_{R.B=\blacksquare ?} \; R|}_{= S \cdot |R|}$$



schedule
- seq of R + W

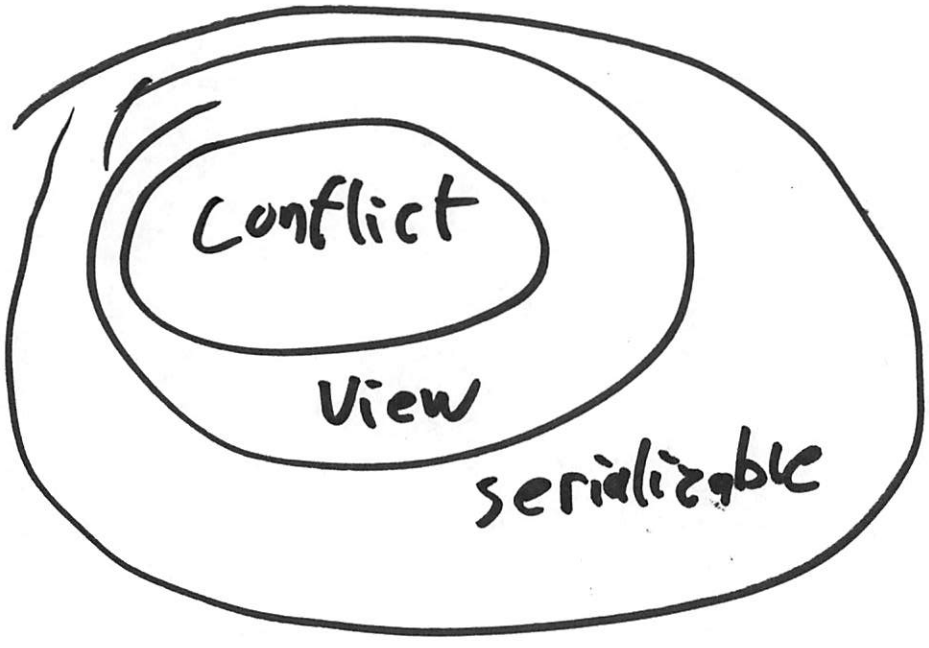
Objects
- DB
- Table
- Column
- Row
- Cell
- Set of rows
- Page

Serial Schedules
- all ops one xact at a time

Serializable
- identical output to A serial sched
  - final DB state
  - all xact reads

R(A)
W(A)

Conflicts
- W-W
- W-R
- R-W



Conflict Serializability

T_1 is Conflict equiv to T_2 if

all conflicts are in same order

if T_1 writes to A then T_2 reads A

$T_1 \Rightarrow T_2$

comes before

View Serializability

$T_1: W(A), T_2: W(A), T_3: W(A)$

R(A) → Reads make the object visible

can swap "hidden" ops

- 2P Locking → Conflict serializability
- OCC → (Read, Val, Write) — based on validation step (typically conflict)
- TS CC → View ser
  - ↳ MVersion → Allows R-W conflicts