

II) Recoverable schedule?

2. Simple Two-way Merge Sort + example + cost?

II

	T1	T2	T3
①	lock-X(A) R(A) W(A)	lock-X(B) R(B) W(B)	lock-X(C) R(C) W(C)

Is this exec. possible under  
Strict 2PL?

Justify!

E in 2PL

② la fel ca exemplu

③ la fel ca exemplu

④  $R1[10, C1, C2, C3]$   
 $R2[10, C7, C9, 10 \text{ Rel } 1]$

$R1$ : 100.000 records, 40 records/page

$R2$ : 10.000 records, 50 records/page

a) 100 Buffer Pages available

$R1 \otimes R2$   
 $Rel 1: 10 = R2 \cdot 10 \cdot Rel 1$

Cost with: - sort merge join  
 - hash join

- page-oriented nested loops join.

?

- e) R1 fragmented: 10, C1 stored at City  
10, C2, C3 stored at Backrest

Describe eval of the query:

SELECT AVG(C2)

FROM R1

WHERE C1 >= 9

III ① To prevent SQL injection attack:

- A a) data validation is performed with regular expressions  
B b) statements are parameterised  
c) string separators are preceded with "\"  
d) users are asked nicely not to commit an attack  
e) none

② T1 and T2 are 2 concurrent transactions. The final result of their execution must be identical to the result obtained when executing:

- a) only T1  
b) only T2  
c) either T1 or T2, but not both  
D d) T1 followed by T2, or T2 followed by T1  
e) none of the above answers is correct

③ In the strict 2PL protocol:

- a) locks are never used
- b) locks are used to control concurrent access to data
- c) transaction  $T$  can ask for a new lock after it released a lock
- d) all the locks of a transaction are released when it completes execution
- e) none

B, D

④ The system crashes at time  $t$ . The REDO phase of ARIES:

- a) identifies all the active transactions at time  $t$
- b) brings the DB to the state it was in at time  $t$
- c) undoes the changes of transactions that were active at time  $t$
- d) ARIES doesn't include a REDO phase
- e) none

B sau E?

⑤ In vertical fragmentation A, C

- a) the reconstruction operator is the natural join
- b) \_\_\_\_\_ union
- c) fragmentation is performed with projection
- d) \_\_\_\_\_ " \_\_\_\_\_ selection
- e) none

⑥ In primary site replication

a) changes to secondary copy are propagated to the primary copies

b) \_\_\_\_\_ primary \_\_\_\_\_  
secondary \_\_\_\_\_ B, C

c) The Capture ~~step~~ step can be implemented using the log

d) \_\_\_\_\_ can't \_\_\_\_\_

e) none

⑦ Which of the following factors must be considered when choosing an alg. for a relational operator?

a) uses of relations

b) existence of indexes B, C, D

c) existence of sorting orders

d) size of the available buffer pool

e) none

⑧ I is an index with search key  $\langle a, b \rangle$  ?

a) I hash index, I matches  $a=9 \wedge b=10$

b) I hash index, I matches  $a=9 \wedge b=10 \wedge c=2$

c) \_\_\_\_\_ // \_\_\_\_\_  
 $a < 9 \wedge b < 10 \wedge c < 2$   
 $\wedge d < 10$

d) I B+tree index, I matches  $a=9 \wedge b < 10$

e) none

9) Under READ COMMITTED

- a) dirty reads occur
- b) NOT B, C
- c) ~~no~~ nonrepeatable reads occur
- d) NOT
- e) none

10) Consider

Select \*

F R

W R.C > '100%

The cost is:

- a) 9E/0
- b) 90 ?
- c) 1/90
- d) 1/9
- e) none

11) When undoing the change of an Update log record:

- a) a Commit log record is written on ~~itself~~ the log
- b) Allobor
- c) Compensation
- d) no log records written ?
- e) none

(12)  $\frac{1}{2}$  data replication:

a) voting = sync. A, D

b) voting = Async.

c) P2P = sync. (peer-to-peer)

d). P2P = Async

e) none

(13) Which of the alg. below uses indexing techniques

a) sort-merge-join

b) index nested loops join B

c) page-oriented nested loops join

d) hash join

e) none

(14) System catalog maintains at least:

a) relation cardinality and size

b) index " " " " A, D

c) index transcendence

d) index height

e) none