1. Arity / Degree : No. of columns / attributes.

2. Cardinality : No. of tuples.

3. No. of non-Trivial F.D formation. Let R(A, B, C)

$X \longrightarrow Y$

${}^3C_1$ and $q^{{}^3C_1 + {}^3C_2}$

+

${}^3C_2$ and $q^{{}^1C_1}$

4. C.K may take NULL values.

$A \to BC \quad C \to E$

5. Properties of Decomposition
   - Dependency preserving
   - Lossless Join.

(ABC) (CE)

$A^+ = (ABC)$ ✓

$B^+ = (B)$

$C^+ = (C)$

$AB^+ = (ABC)$

Information

$A \to BC, C \to E$ ✓

6	$X \longrightarrow Y$	1NF	2NF	3NF	BCNF
1.	Proper subset of CK / Non prime attribute	✓			
2.	Non prime attribute / Non prime attribute	✓	✓		
3.	~~proper subset~~ of one CK / proper subset of another CK	✓	✓	✓	

Top goals	Things to do	Notes
4. Super key	✓ ✓	✓ ✓

SHYAM STEEL

- If not commited and crached → undo
- If ~~not~~ commited and crashed → redo.

7. i. Atomicity - Recovery Managment Component
   uses → Transaction log.

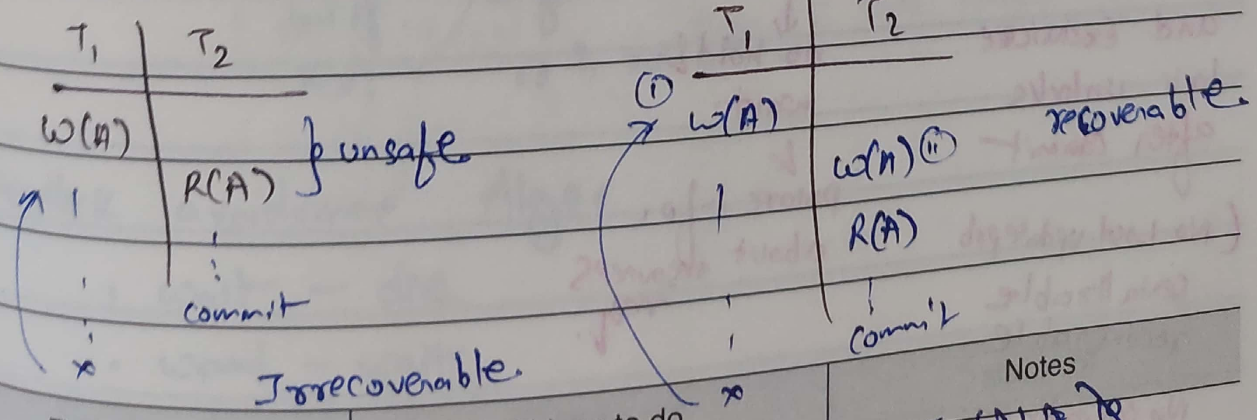
   ii. Durability :- RAID : Redundant Array of Independant Disk
   +
   ~~Transition log.~~

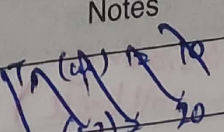
   iii. Isolation : Serial ; concurrent →
   → Concurrency Control Component

   iv. Consistency : Concurrency Control Comp t
   recovery mang. n.

8. If not commited & crashed → undo.
   commited & crashed → redo.

9.



Top goals	Things to do	Notes
		

10. Cascading Rollback → problem with WR

11. Cascadless recoverable sch → NO WR allowed.

12. Strict → No WR & WW allowed.

↳ Not free from RW but not a problem.

13. Concurrency Control protocols.

i. Lock based.

- Basic 2PL

↳ No new lock in Shrinking phase.

- Strict 2PL ← → Irrecoverable
  - → Deadlock. → starvation ↳ No sol.
  - ↓ Basic 2PL + No WW and WR and Exclusive lock unlocks after commit (No Lost update prob, Serializable, recoverable, No cascading rollback)
  - ↓ Conservative 2PL ↓ no hold & wait & prior info. about resources req.

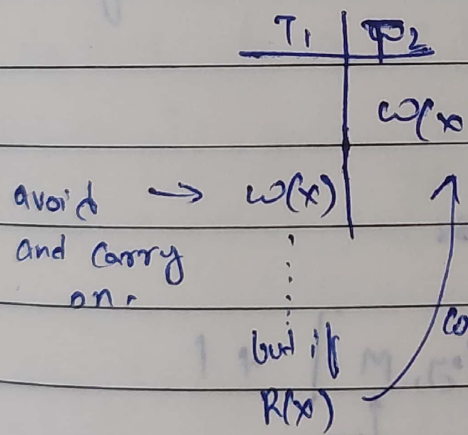
Top goals	Things to do	Notes

- Rigorous 2PL → Deadlock still possible.
  Basic 2PL + Shared & Exclusive lock unlock after commit only.

Time stamp based:

- old wants to read when WTS is high (Newer)
  Not allowed & roll back old.
- old wants to write but WTS or RTS high (New)
  Roll back old.

- Thomas write



Deadlock avoidance Algor

- wait – die
- wound – wait

Top goals ↑ old	↑ new Things to do	Notes

HYAM STEEL

15. Blocking Factor = $\frac{\text{Block size} - (\text{Block header size})}{\text{(Avg.) Record size}}$.

16. Spanned organization: ! For variable long.
No internal frag.
more IO cost.
B.F can be in fraction.

17. Unspanned Organization: For fixed length.
Internal frag.
less IO cost
BF can't be in fraction.

18. Indexing.

BF of ~~index file~~ > BF of

Woost case IO cost = $\lceil \log_2 M \rceil + 1$

M = no of block in index file.

Top goals

+

ER from copy /

1 to M or M to 1

1 = partial
↳ 2 table

many's side joining

Relational Constraints

1. Domain Constraint
   : Column must be atomic.
2. Key Constraint or Tuple Uniqueness Constrain : Every relation must be unique.

1 to 1 ① : P.K with partial part

M to M ② : Join with to side + Joine P.K.

3. Entity Integrity Constrain : No null in PK.

Top goals	Things to do	Notes
4. Referential Constrain	Integrity :	Specified b/w 2 relat to form consistency [F.K].

SHYAM STEEL

Intersection : $A - (A - B)$

$\div$: return those tuples from relation A which are associated to every tuple of B.

A		B
S1	S2	S2
A1	X1	X1
A2	X1	X2
A1	X2	

$\Pi_{S1}(A \div B)$

:: A1

$Y \leftarrow (\Pi_{sid}(E) \times \Pi_{cid}(C)) - \Pi_{sid,cid}$

universal

$\Pi_{sid,cid}\ E \div \Pi_{cid}\ C \leftarrow \Pi_{sid}(E) - \Pi_{sid}(Y)$

The following table has 2 attribute A & C where A is the PK and C is the FK, referencing with on delete cascade.

The set of

DBMS + E. Maths 2021 [SQL + Probability]

- A relation $r(A, B)$ in a relational database has 1200 tuples. The attribute A has integer values ranging from 6 to 20, and the attribute B has integer values ranging from 1 to 20. Assume that the attribute A and B are independently distributed. The estimated no. of tuples in the output of

$\sigma_{(A>10) \vee (B=18)}(r)$ is _____.

Condition 1. $A > 10 \Rightarrow$ 11 to 20 = 10

$\therefore P(A>10) = 10/15 = 2/3$

Condition 2. $B = 18 \Rightarrow 1$

$P(B = 18) = 1/20.$

Given. $P[(A>10) \vee (B=18)] = P(A>10) + P(B=18) - P[(A>10) \wedge (B=18)]$

$= \frac{2}{3} + \frac{1}{20} - \left(\frac{2}{3} \times \frac{1}{20}\right)$

↳ As said to be independent.

$= 41/60$

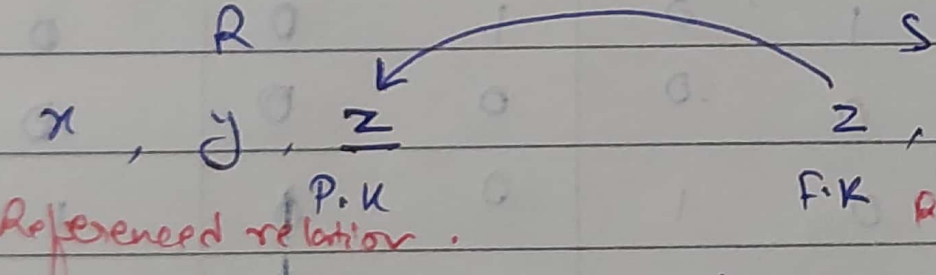
$\therefore$ Out of 1200 tuples $41/60 \times 1200 = 820$ tuples Ans,

DBMS 2021 [Lossy & Loss less]

- Consider the Relation (P, Q, S, T, X, Y, Z, W) with the following

DBMS Mock. [Keys]

- Consider the relation $R(x, y, z)$ and $S(z, q, r)$ where z is Primary key of R and q is the primary key of S. Relation R contains 600 tuples and relation S contains 700 tuples, what will be maximum number of tuples possible in $R \bowtie S$?



The table that contain's FK. that becomes the no. of tuple after joining ∴ 700 Ans.

59. DBMS Super Mock [Candidate Key]

- A relation R has 13 attributes, what is the maximum number of Candidate Keys this relation R can have?

We get maximum number of Candidate Keys, when we pair two attributes together. Therefore,

$$= {}^{n}C_{\lfloor n/2 \rfloor}$$

$$= {}^{13}C_{6} \Rightarrow 1716.$$

Note,

no. of Super keys $= 2^{n} - 1$

and when CK given $= 2^{n-k}$

asked Apr 18 • edited Apr 18 by **Shubham Sharma 2**
573 views

0

R(A1, A2,A3,A4....AN). How many super keys possible in relation? If (A1 is candidate key, A2 is candidate key, A3 is candidate key)

Databases #databases #superkeys

asked Apr 18 • edited Apr 18 by **Shubham Sharma 2**

Ssm

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2 Answers

Standard answers | Video answers

Best answer

2

Total Super Keys = {(Total number of super keys with A1 Candidate) U (Total number of super keys with A2 Candidate) U (Total number of super keys with A3 Candidate)}

From Set Theory Concep ... U C) = A + B +C -AB - BC - CA

Ssm

Answer Comment Share ...

2 Answers

Standard answers | Video answers

Best answer

2

Total Super Keys = {(Total number of super keys with A1 Candidate) U (Total number of super keys with A2 Candidate) U (Total number of super keys with A3 Candidate)}

From Set Theory Concepts, (A U B U C) = A + B +C -AB - BC - CA +ABC

Total Super Keys = (super keys with A1) + (super keys with A2) + (super keys with A3) - (super keys with A1 and A2) - (super keys with A2 and A3) - (super keys with A1 and A3) + (super keys with A1 and A2 and A3)

$= 2^{n-1} + 2^{n-1} + 2^{n-1} - 2^{n-2} - 2^{n-2} - 2^{n-2} + 2^{n-3}$

$= 2^{n-3} (12 - 6 + 1)$

$= 7 * 2^{n-3}$

answered Apr 18 • selected Apr 18 **Ssm**

Manishanka