Assignment : 03

Md. Sabbir Akon
2230242
Sec: 10

Ans to the Q.S No. 1

a) As no multivalued or composite attributes or nested relations present in given schema, it is in INF.

b) There are partial dependencies due to FD1, it is not in 2NF.

Room:

Course code	Section No.	Semester	Slot	Room No.	Building No.	Total-Student	Capacity

Course:

Course_code	Department	Course-title	Credit

Co-ordinator:

Course_code	Semester	Co-ordinator Name	Co-ordinator initial	Co-ordinator E-mail

c) The schema of no. b is not in 3NF because there are transitive dependencies due to FD3 and FD4 in Room and Co-ordinator tables.

Course:

Course-code	Department	Credits	Coordinator-title

Coordinator-course:

Course-code	semester	Co-ordinator_ini

Coordinator-profile:

Coordinator_ini	Coordinator-name	Coordinator-email

Course-offer:

Course-code	Semester	SectionNo	Room	Building	slot	total-std

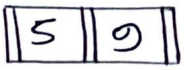
Room:

Room-No	Building	Capacity

Ans to the Q.S No. 2

n: 3

Insert 9, 5 :



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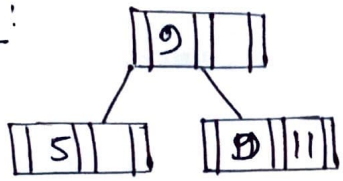

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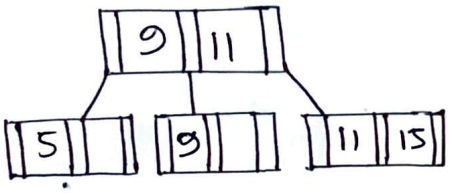

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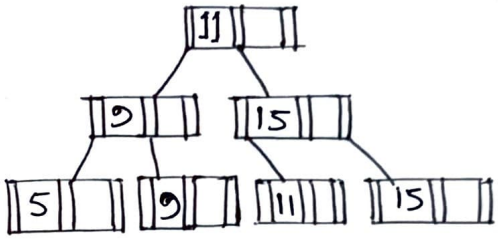
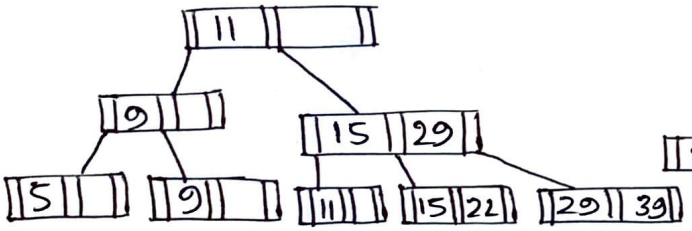


Insert 29, 22 :



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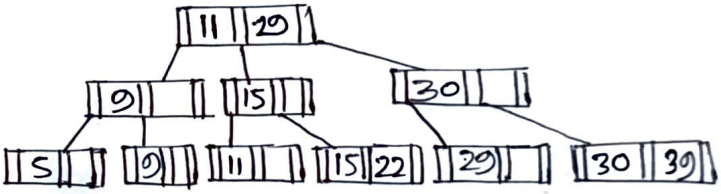
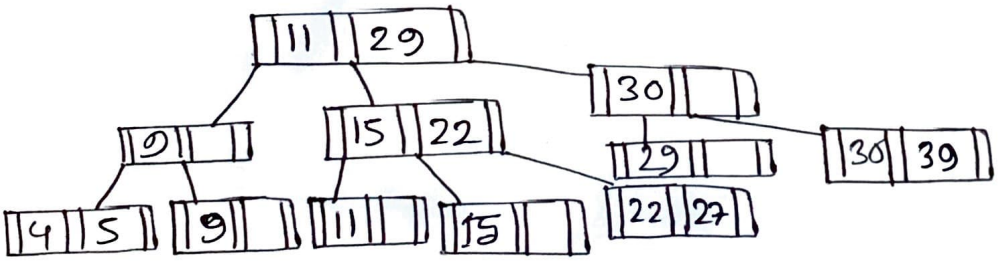


Insert 4, 27 :



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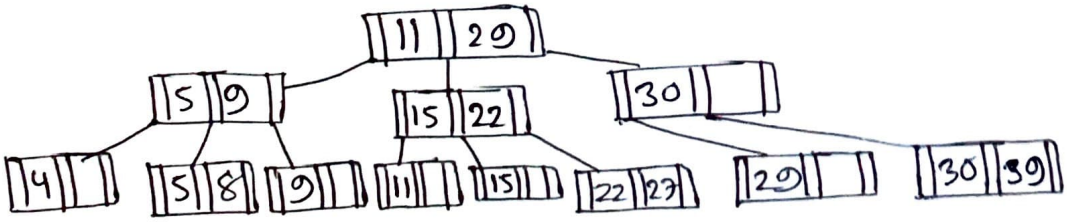

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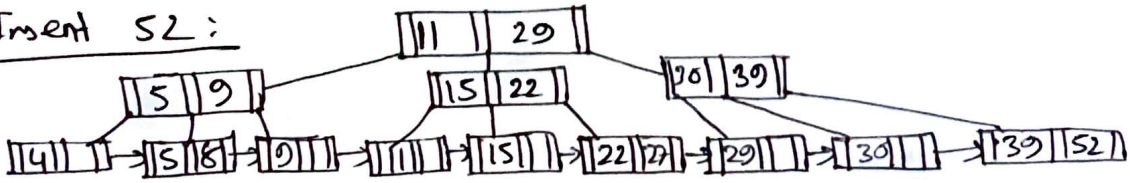
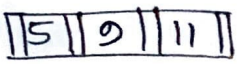


Ans to the Q.S No. 3

n = 4

Insert ~~5, 9, 11~~ 9, 5, 11 :



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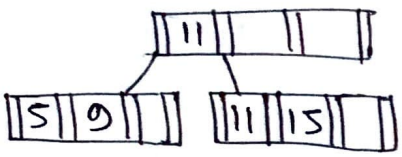

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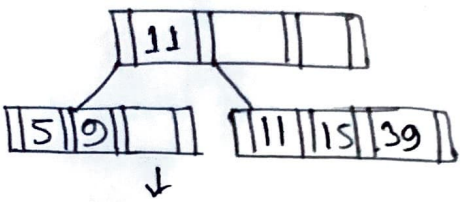

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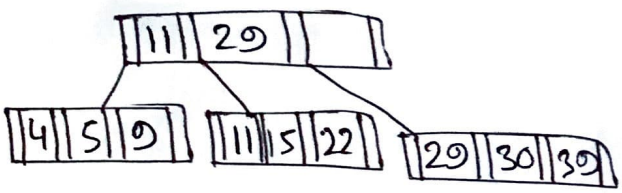

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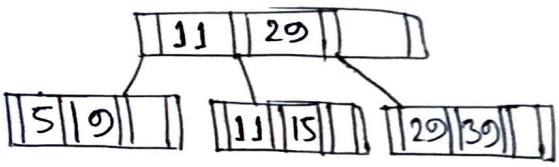

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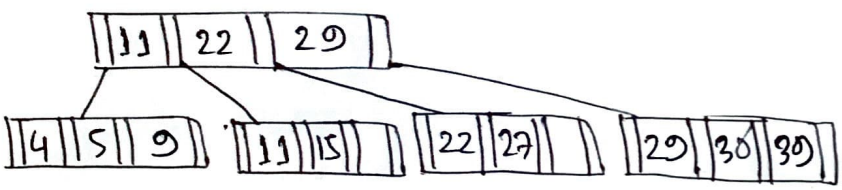

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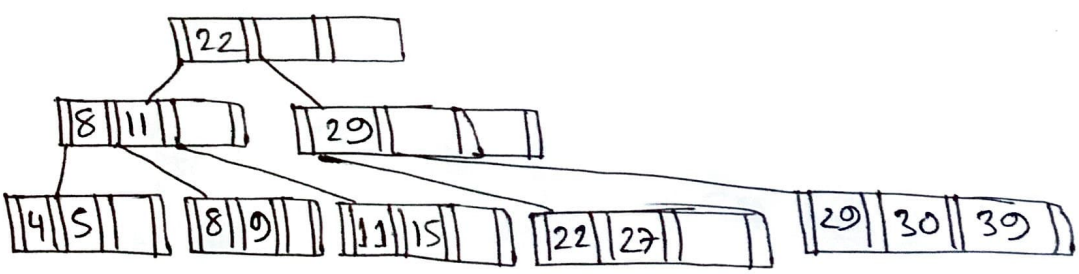

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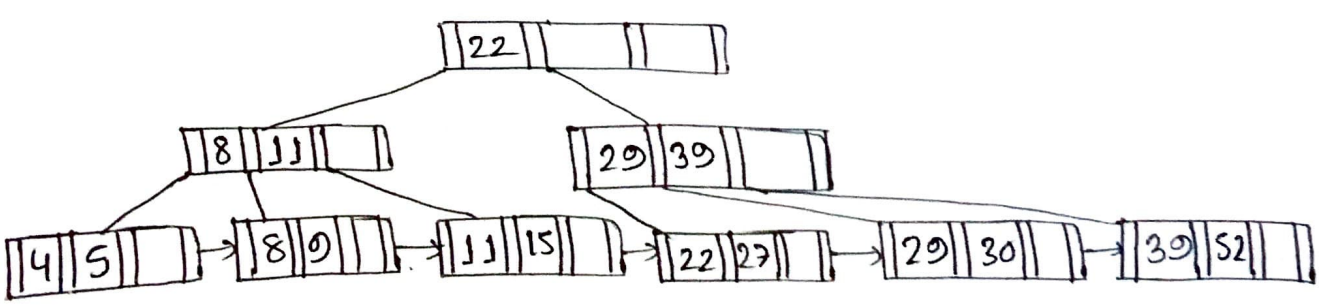

Ans to the Question No. 4

The scenerio demonstrates a temporary update issue, where Sarah reads an uncommitted value updated by John. Since John's transaction is later rolled back, Sarah's actions are based on incorrect data which leading to inconsistencies.

Implications:

(i) inconsistent Data: Sarah overpaid due to acting on a value that wasn't finalized.

(ii) Integrity issue: The system ends up with conflicting states for the room price.

(iii) Customer problem: Overpayment can result in disputes and dissatisfactions.

Solutions:

(i) Ensures Sarah can only access finalized values, avoiding intermediate updates by John.

(ii) Guarantees that once Sarah reads the room price it does not change during her transaction.

(iii) Executes transactions sequentially to prevent interference

Ans to the Q.S No.5

The scenerio demonstrates the Lost update problem. This occurs when two transactions read the same initial value and update it concurrently. The updates overwrite each other, leading to incorrect results, in this case, the stock incorrectly remains 0, even though two items were sold where only one was available.

Explaination: Both Alex and Jordan read the same stock value of 1 before either transaction is committed. Alex deducts 1, writes the stock as 0 and commits. Jordan, operating on the same stale stock value deducts another 1 and overwrites Alex's correct stock update. This results in the inventory incorrectly reflecting 0 despite overselling the product.

Solution: Lock the stock record when a user reads it, preventing other transactions from accessing the same stock until the first transaction is committed. This ensures only one transaction processes the stock at a time.

Use timestamps to detect if the stock has changed since it was last read. If a conflict is detected the transaction is rolled back, and Jordan is prompted to retry.

Ensure transactions are executes in a sequential manner, eliminating the possibility of simultaneous updates.