1.(a) Insertion anomaly occurs when you are inserting inconsistent information into a table. When we insert a new record, such as account no. A-306 in fig. we need to check that branch data is consistent with existing rows.

| Account no. | Balance | Customer | branch | address | assets |
|---|---|---|---|---|---|
| A-101 | 500 | 131313 | Downtown | Brooklyn | 9000000 |
| A-102 | 400 | 131313 | Perryridge | Horseneck | 17000000 |
| A-113 | 600 | 9876543 | Round Hil | Horseneck | 8000000 |
| A-201 | 900 | 9876543 | Brighton | Brooklyn | 7100000 |
| A-215 | 700 | 1111111 | Manus | Horseneck | 400000 |
| A-306 | 800 | 11111111 | Round hill | Horseneck | 800000 |

Ex:- Example of an insertion anomaly.

- Update Anomaly:-
If a branch changes address, such the Round Hill branch in fig, we need to update all rows referring to that branch. Changing existing information incorrectly is called an update anomaly.

| Account no. | Balance | Customer | Branch | address | assets |
|---|---|---|---|---|---|
| A-101 | 500 | 131313 | Downtown | Brookyln | 9000000 |
| A-102 | 400 | 131313 | perryridge | Horseneck | 17000000 |
| A-113 | 600 | 9876543 | Round hill | Horseneck | 8000000 |
| A-201 | 900 | 9876543 | Brighton | Brooklyn | 7100000 |
| A-215 | 700 | 1111111 | manus | Horseneck | 400000 |

update anomaly - Round hill branch address

Ex:- Example of an update anomaly.

- A deletion anomaly occurs when you delete a record that may contain attributes that shouldn't be deleted. For instance, if we remove information about the last account at a branch, such as account A-101 at the Downtown branch in figure, all of the branch information disappears.

| Account no. | balance | customer | branch | address | assets |
|---|---|---|---|---|---|
| A-101 | 500 | 1313131 | Downtown | Brooklyn | 900000 |
| A-102 | 400 | 1313131 | Perryridge | Horseneck | 1700000 |
| A-113 | 600 | 9876543 | Roundhill | Horseneck | 8000000 |
| A-201 | 900 | 9876543 | Brighton | Brooklyn | 7100000 |
| A-215 | 700 | 1111111 | Manus Redwood | Palo alto | 2100000 |
| ~~A-222~~ A-305 | ~~320~~ 350 | 1234567 | Roundhill | Horseneck | 8000000 |

Deletion anomaly - Bank Account

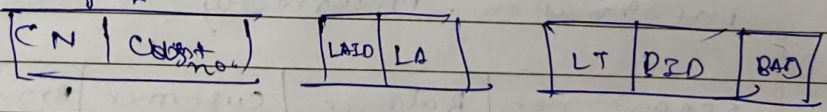
Fig - Example of a deletion anomaly.

(b) Assumption :-

Customer → multiple type of loans

primary key → CN, LAID, B_ID → composite

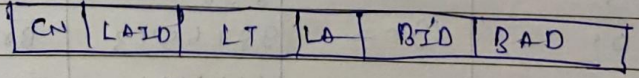
1NF - pk



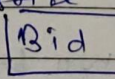

2NF -

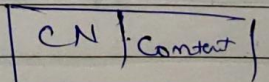
It contain partial dependency CN | cust_no.

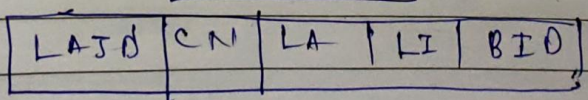
Now,



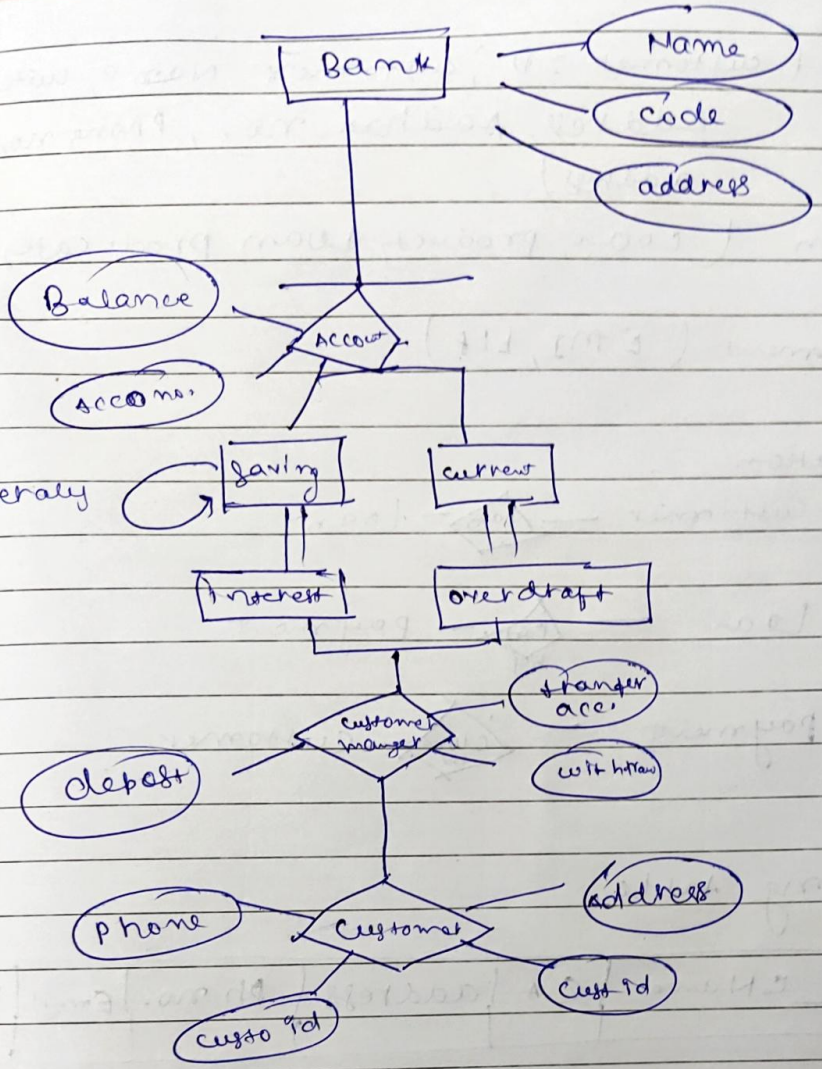

3NF - Transitive dependency



2.




3. URL Account ( Group URLID (Foreign key))

Accounting ~~translate~~ template (prod.Id, stageId, URLID, Charge code ID)

Product (code)

Scheme (Scheme ID, product flag (fk))

Document (DOC)ID, SchemeId (fk)

Constitution, product ID (fk); property Id

Scheme charge (ch-Scheme ID), Charges ID

Charges (charge ID, charge code ID)

charge code (charge code ID)

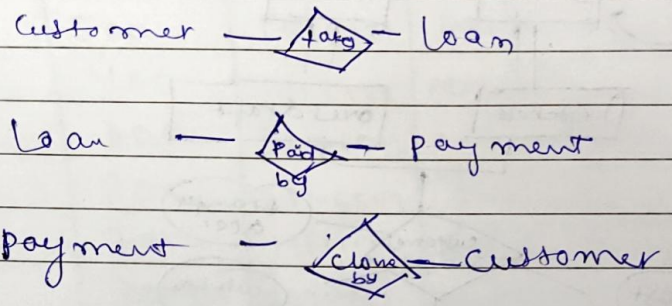
promotion (Scheme · ID (fk))

4 (a) (i) Customer ( customer ID ; customer Name, customer Address, Aadhar no., Phone no, email address)

(ii) Loan ( Loan product, Loan prod. category)

(iii) payment ( EMI, LLP)

Relation




(b) Creating table

| C.ID | CName | CA | address | Ph no. | Email | loan category | LP |
|---|---|---|---|---|---|---|---|

| Loan Product Category | Loan product |
|---|---|
| Home Loan | Under construction |
| Home Loan | ~~Go~~ |
| ~~Auto~~ Loan | 4 wheeler |
| ~~Auto~~ loan | 2 wheeler |
| Consumer loan | Electrical item |
| Consumer loan | Furniture |
| Education Loan | Undraduate |
| Education | post graduate |

1NF :- Primary key ⇒ C.ID, LP

| C ID | CName | CA | Cadd | Phone. | Email | LC | LP |
|---|---|---|---|---|---|---|---|

2 NF :-

| CID | C_Name | CA | CAdd | Phone. | Email | LP |
|---|---|---|---|---|---|---|

| Lc | LP |
|---|---|

3 NF :- contain transitive dependency.

| CID | cName | CA | CAdd | Phone | Email | LP | Lc | LP |
|---|---|---|---|---|---|---|---|---|

So therefore,

| C_ID | CA | LP |
|---|---|---|

| CA | CNone | C_Add | Phone. | Email |
|---|---|---|---|---|

primary key - CA

| Lc | LP |
|---|---|