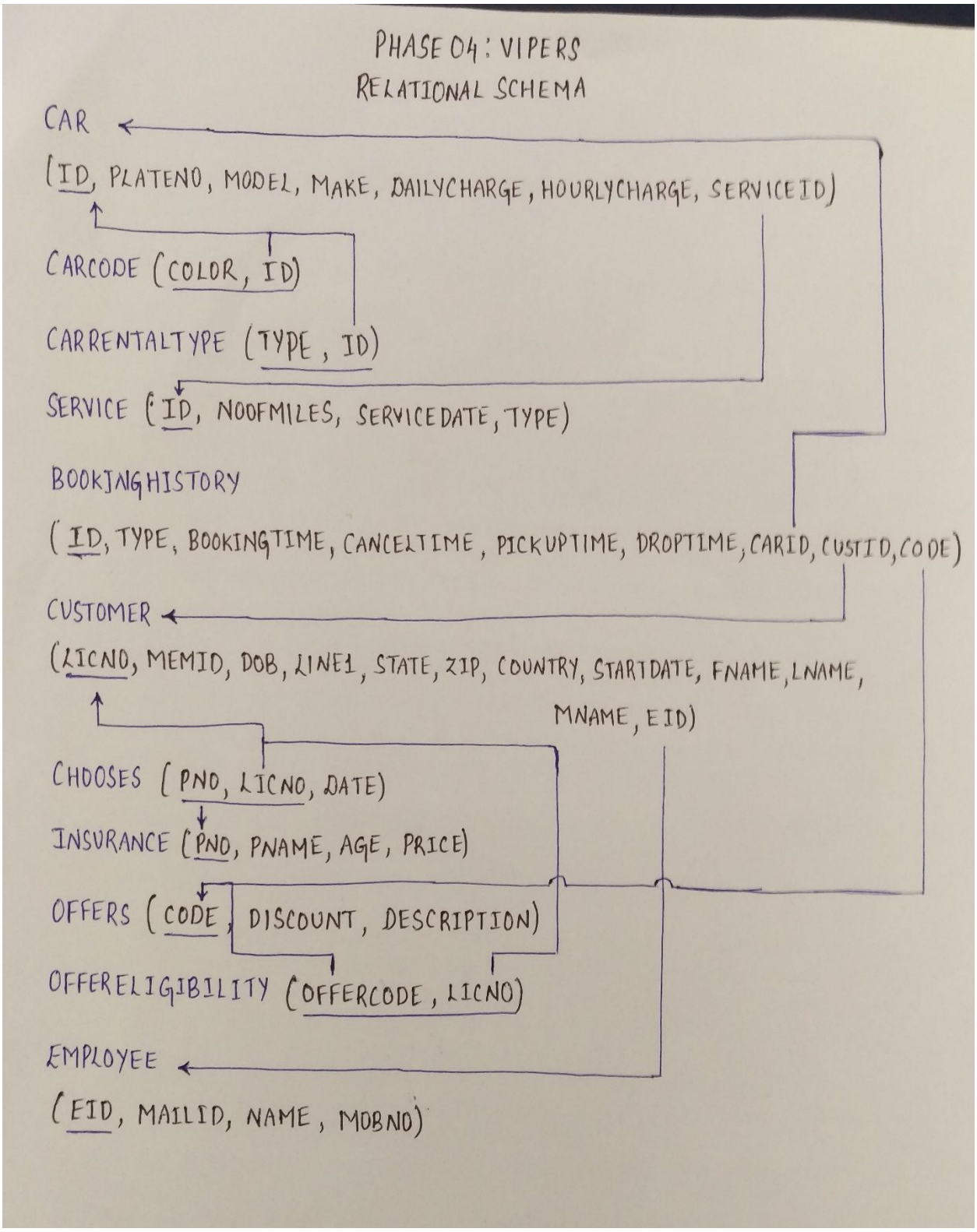
Phase 12 Vipers



PHASE 1 2 - VIPERS

CAR

Functional Dependencies

ID → Plateno, Model, Make, Dailycharge, Hourlycharge, ServiceID

Plateno → ID, Model, Make, Dailycharge, Hourlycharge, ServiceID

Model, Make → Dailycharge, Hourlycharge

CANDIDATE KEY → Plateno, ID (Primary key in schema)

Relation is in 2NF.

CARCODE

Functional Dependencies → none

CANDIDATE KEY → (Color, ID) (P.K. in schema)

Relation is in BCNF

CARRENTALTYPE

Functional Dependencies → none

CANDIDATE KEY :- (Type, ID) (P.K. in schema) Relation is in BCNF

~~BOOKINGHISTORY~~ CUSTOMER

Functional Dependencies

Licno → MemID, DOB, Line1, State, Zip, Country, Startdate, Fname, Mname, Lname, Eid

Line1 → State, Zip, Country

Zip → State, Country

CANDIDATE KEY :- Licno (P.K. in schema) Relation is in 2NF

PHASE 12 VIPERS

BOOKING HISTORY

Functional Dependencies

ID → Type, Bookingtime, Canceltime, Pickuptime, Droptime, CarID, CustID, Code

CustID, Bookingtime → Type, Canceltime, Pickuptime, Droptime, CarID, Code

CarID, Bookingtime → Type, Canceltime, Pickuptime, Droptime, CarID, Code

CANDIDATE KEY → (CustID, Bookingtime), (CarID, Bookingtime), ID
(P.K. in schema)

Relation is in BCNF

CHOOSES

Function Dependency

PNO, Licno → Date

CANDIDATE KEY → (PNO, Licno)
↳ (P.K. in schema)

Relation is in BCNF

SERVICE

Functional Dependencies

ID → Noofmiles, Servicedate, Type

CANDIDATE KEY → ID (P.K. in schema)

Relation is in BCNF

PHASE 12 VIPERS

INSURANCE

Functional Dependencies

PNO → Pname , Age , Description

Pname → PNO, Age , Description

CANDIDATE KEY :- Pname , PNO — (P.K. in schema)

Relation is in BCNF

OFFERS

Functional Dependencies

Code → Discount , Description

CANDIDATE KEY :- Code (P.K. in our schema)

Relation is in BCNF

OFFERELIGIBILITY

Functional Dependencies → none

CANDIDATE KEY : (offercode, Licno)
(P.K. in schema)

Relation is in BCNF

EMPLOYEE

Functional Dependencies

EID → MailID, Name , Mobno

MailID → Eid, Name, Mobno

CANDIDATE KEY: MailID, EID
↳ (P.K. in schema)

Relation is in BCNF

PHASE 12 VIPERS

Anomolies in CAR relation

Due to the FD Model, Make → Dailycharge, Hourlycharge there arises anomolies in the CAR relation.

i) Insert Anomaly :- Let us say we have values for model and make as SUV, FORD EXPLORER and their corresponding charges as 40 and 15. Even though we have these values, we cannot insert them into the relation as ID cannot be NULL. It violates entity integrity

ii) Update Anomaly :- If for a model and make, daily/hourly charge gets updated, then in the relation it needs to get updated for each ID that corresponds to that particular model and make.

Anomalies in CUSTOMER RELATION

Due to the FD line 1 → State, Zip, country even though we have a valid address we cannot insert it into the customer relation unless we have a LICNO associated with it. This is because LICNO is a primary key and it cannot be null.

PHASE 12 VIPERS

Decomposition for CAR

D = { (ID, Plateno, Model, Make, ServiceID) [R1], (Model, Make, Dailycharge, Hourlycharge) [R2] }

Minimal cover of FD's of CAR

{ ID → PlateNO [R1], ID → model [R1], ID → Make [R1], ID → ServiceID [R1], plateno → ID [R1], plateno → make [R1], plateno → model [R1], Model, Make → Dailycharge [R2], Model, Make → Hourlycharge [R2], plateno → ServiceID [R1] }

Every FDP is covered. Hence D is FDP.

Initial tableau for LJD

	ID	plateno	Model	Make	Dailycharge	Hourlycharge	ServiceID
R1	a	a	a	a			a
R2			a	a	a	a	

After applying FD's row 1 becomes all a's. Hence, LJD

	FD's inherited	Key	NF
R1	ID→plateno, ID→model, plateno→model, ID→make, ID→serviceID, plateno→make, plateno→ID, plateno→serviceID	ID	BCNF
R2	Model, Make → Dailycharge Model, Make → Hourlycharge	Model, Make	BCNF

PHASE 12 - VIPERS

Decomposition for CUSTOMER relation

$D = \{$ (LicNo, MemID, DOB, Line1, StartDate, Fname, Lname, Mname, EID) [R1], (Line1, Zip) [R2], (Zip, State, Country) [R3] $\}$

Minimal cover of FD of Customer is

LicNo → MemID [R1], LicNO → DOB [R1], LicNo → Line1 [R1], LicNO → StartDate [R1], LicNo → Fname [R1]

LicNo → Lname [R1], LicNo → Mname [R1], LicNo → Eid [R1], Line1 → Zip [R2], Zip → State [R3],

Zip → Country [R3]

Each FD is preserved in D. Hence D is FDP

Initial tableau for LJD.

	LicNO	MemID	DOB	Line1	StartDate	Fname	Mname	Lname	EID	zip	State	Country
R1	a	a	a	a	a	a	a	a	a			
R2				a						a		
R3										a	a	a

After applying some FD's row 1 has all a's. Hence D is LJD.

	FD's inherited	Key	NF
R1	LicNo → MemID, DOB, Line1, StartDate, Fname, Mname, Lname, EID	LicNo	BCNF
R2	Line1 → zip	Line1	BCNF
R3	Zip → State, Country	zip	BCNF