**Design of Relational DB**

**Signup:**

**Relation Schema:**

Below is the relation schema for Signup table

Signup = {username, firstname, lastname, dob, ssn, email, password}

We use below abbreviations: S = {uname, fn, ln, dob, ssn, email, pwd}

**Functional Dependencies for Signup table:**

uname -> fn, ln, dob, ssn, email, pwd.

**BCNF:** Yes, it is in BCNF.

**Reason:** For above non-trivial FD,LHS of FD is a super key. To verify the same, calculate the closure of uname. It determines all the attributes in Signup table.

{uname}+ = {uname, fn, ln, dob, ssn, email, pwd}.

**Car Information:**

**Relation Schema:**

Below is the relation schema for Car\_information table

CarInformation = {vehicle\_id, make, model, year, color, price, yearaddedtoinventory, type, mileage, engine, transmission, incentives, downpayment, interestrate}

We use below abbreviations:

CI = {vid, mk, mdl, year, clr, price, yai, type, mil, eng, transm, incen, dp, intr}

**Functional Dependencies for Car\_information** **table:**

vid -> mk, mdl, year, clr, price, yai, type, mil, eng, transm, incen, dp, intr

**BCNF:** Yes, it is in BCNF.

**Reason:** For above non-trivial FD,LHS of FD is a super key. To verify the same, calculate the closure of vid. It determines all the attributes in CarInformation table.

{vid}+ = {vid, mk, mdl, year, clr, price, yai, type, mil, eng, transm, incen, dp, intr}

**Purchase:**

**Relation Schema:**

Below is the relation schema for Purchase table

Purchase = {purchase\_id, payment, vehicle\_id, username , purchasedate, address, city , state , zip , cardname , cardnumber , expmonth , expyear , cvv , status, year}

We use below abbreviations:

P = {pid, payment, vid, uname, pdate, add, city, state, zip, cname, cno, expmnt, expyr, cvv, status, year}

**Functional Dependencies for Purchase table:**

pid -> payment, vid, uname, pdate, add, city, state, zip, cname, cno, expmnt, expyr, cvv, status, year

**BCNF:** Yes, it is in BCNF.

**Reason:** For above non-trivial FDs, LHS of FD should be a super key. To verify the same, calculate the closure of pid. It determines all the attributes in Purchase table.

{pid}+ = {pid, payment, vid, uname, pdate, add, city, state, zip, cname, cno, expmnt, expyr, cvv, status, year}.