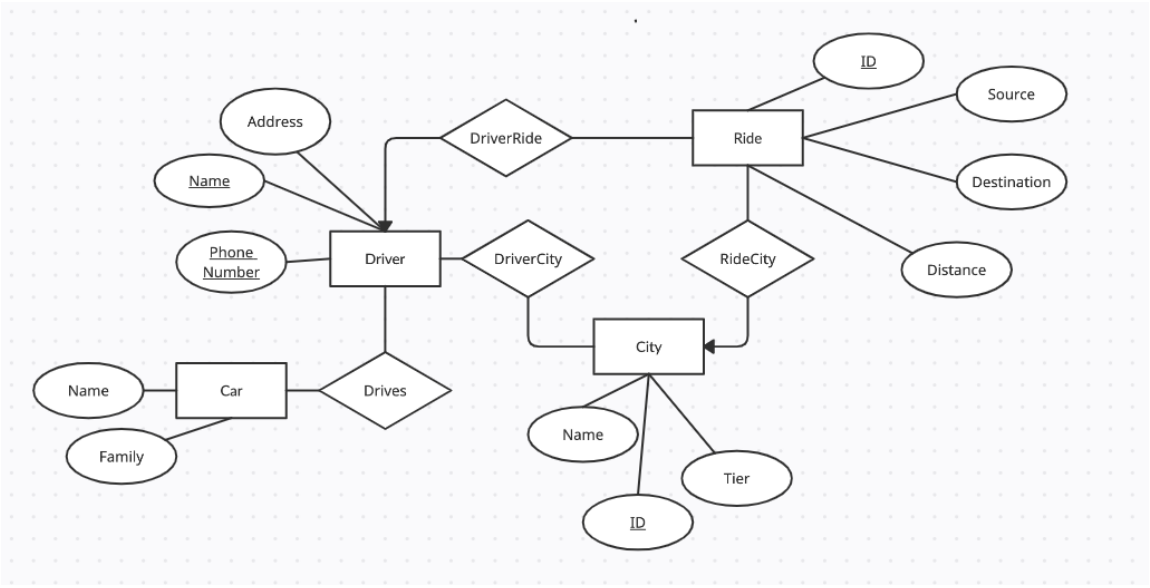
Khoi Nguyen
CS 143 HW 3

1)



a)

b) Relational Schema:

i) CREATE TABLE Driver (Address VARCHAR(100), Name VARCHAR(100), PhoneNumber INT, PRIMARY KEY (Name, PhoneNumber))

ii) CREATE TABLE Car (Name VARCHAR(100), Family VARCHAR(100))

iii) CREATE TABLE City (Name VARCHAR(100), ID INT, Tier INT, PRIMARY KEY (ID))

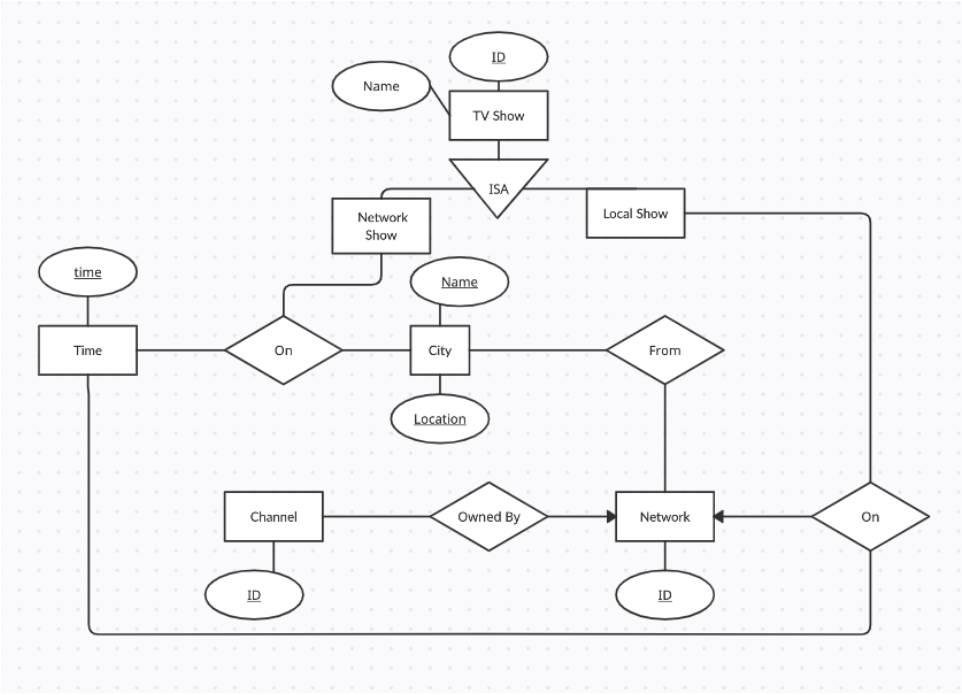
iv) CREATE TABLE Ride (ID INT, Source VARCHAR(100), Destination VARCHAR(100), Distance FLOAT, PRIMARY KEY (ID))

v) CREATE TABLE Drives (DriverName VARCHAR(100), PhoneNumber INT, CarName VARCHAR(100), CarFamily VARCHAR(100), PRIMARY KEY (DriverName, PhoneNumber, CarFamily, CarName))

vi) CREATE TABLE DriverRide (DriverName VARCHAR(100), PhoneNumber INT, RideID INT))

vii) CREATE TABLE DriverCity (Name VARCHAR(100), PhoneNumber iNT, CityID INT)

viii) CREATE TABLE RideCity (RideID INT, CityID INT, PRIMARY KEY(RideID))



2)

3) Programmer(<u>name</u>), TeamLeader(<u>name</u>,team_name), WorksWith(<u>team_name</u>,<u>name</u>,project)

4) Yes, decomposition is lossless. A is the shared unique key and able to get (A,D,E) from R1(A,D,E)

5) (C → A) and (A → B)

6)

a) One to many: sid-> dept,cnum; dept,cnum -> sid
b) Many to one: sid -> dept,cnum

7)

a) Yes, {A}+ = R
b) Yes, {BC}+ = R

8) No not in BCNF

{A}+ = {A,B,C,D,E}
{C}+ = {C,E}
{B}+ = {B,D}
All of the above violate BCNF

Key for relation: A,F

R(A,B,C,D,E,F) → using (C→ E)
R1(C,E)
R2(A,B,C,D,F) → using (B→D)
R3(B,D)
R4(A,B,C,F) → using A→ BC
R5(A,B,C)
R6(A,F)

Final BCNF tables:

R1(C,E), R3(B,D), R5(A,B,C), R6(A,F)