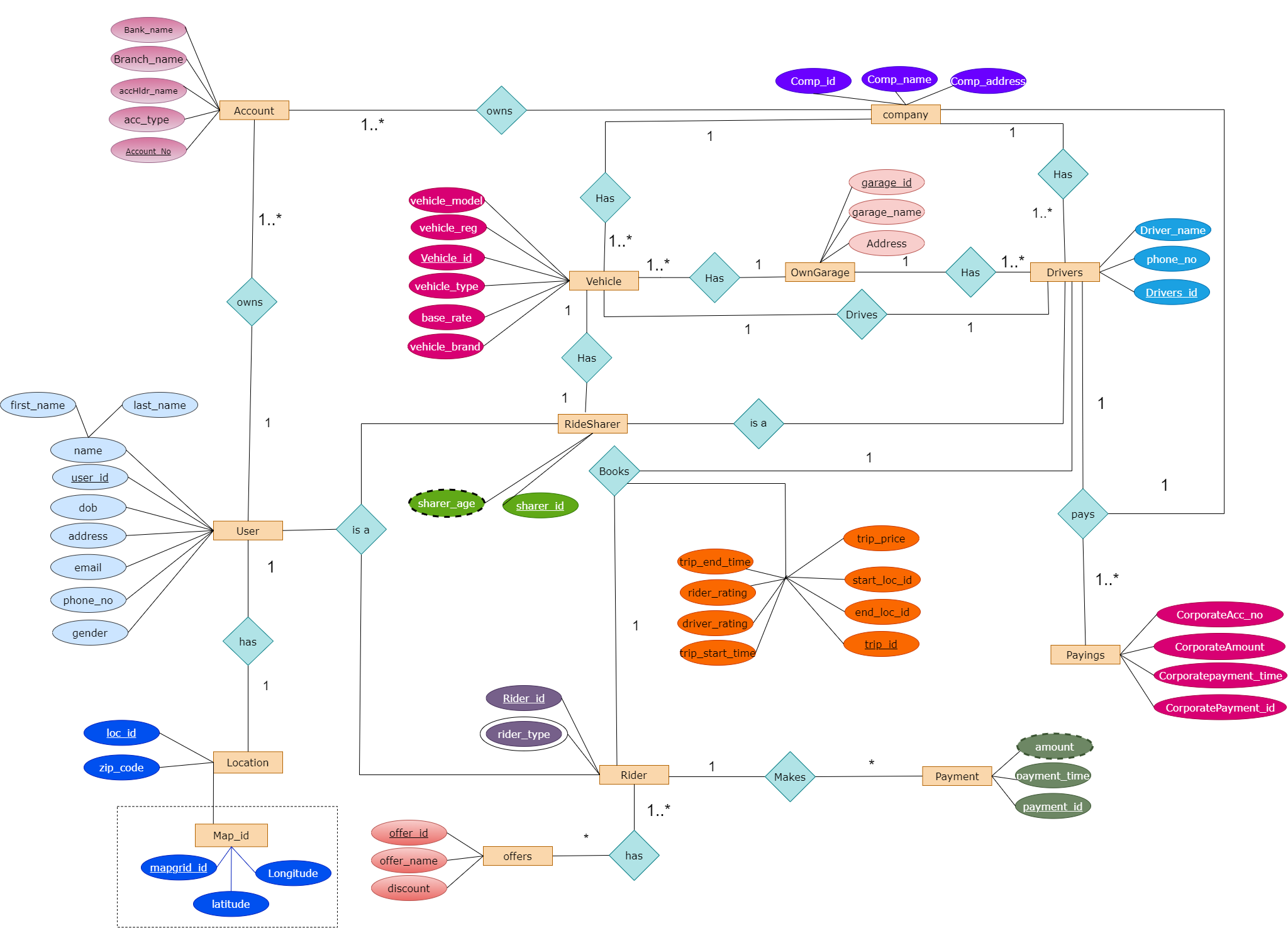
****

Lift is a ridesharing management company. Vehicles from other companies are hired under Lift. The lift has its own vehicles, own drivers, and own garage. Other companies must pay a percentage of the income of their vehicles as those companies are under Lift and are used as Lift’s vehicles. There are two types of users: Driver and rider. Each driver is assigned to only one vehicle, vehicles Lift has its own drivers assigned whereas other companies have their own driver assigned to each vehicle. All vehicles are parked in Lift’s own garage. Riders can choose a vehicle, a specific location, and his/her location and then book a trip to his/her desired destination. When a rider books a trip a driver near to rider’s present location will be assigned for that trip. At the end of the trip, the rider is able to pay the ride fare to the driver and both the driver and the rider can rate each other. After a particular time,1 week/1 month/1 year the companies under Lift will receive full payment for trips of their vehicle.

**Scenario**

The owner of a ride-sharing company named ‘LIFT’ wants to create a database for his company. The company has its unique company id, company name, and company address. The company has Vehicles. Vehicles have vehicle model, vehicle registration, vehicle type, base rate, vehicle brand, and unique vehicle id for each vehicle. Vehicles have their own garage. The own garage has a unique garage id, garage name, and address. The own garage has many drivers. The company has many drivers. Each driver has their driver name, phone number, and unique driver id. Each driver drives only one vehicle. The company ‘LIFT’ pays payment to sub-company as well as ride sharer . Each time of payment a account number, amount, payment time and unique payment id is stored in the database. A user has a first name, last name, a unique user id, date of birth, address, email, phone number, and gender. Each vehicle has a ride-sharer. A ride-sharer is a driver. A user can be a ride-sharer. A ride-sharer has age and a unique sharer id for each ride-sharer The user can be a rider. Each rider has a unique offer id, offer name, and different rider type. Rider books trip, trip information like trip start and end time, start location and end location rider rating, driver rating, trip price and a unique trip id is stored in the database. A rider makes a payment after each trip. Each payment consists of an amount, payment time, and a unique payment id. Each user has a location. Each location contains zip code, a unique location id, and a map id. A map id has a unique map grid id, longitude, and latitude. Each user can own one or many accounts. The company owns many accounts. Each account has a bank name, branch name, account holder name, account type, and a unique account number.

**ER-Diagram**

****

**Normalization**

***User owns Account***

**UNF** - first\_name, last\_name, user\_id, dob, address, email, phone\_no, gender, Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name

**1NF** - first\_name, last\_name, user\_id, dob, address, email, phone\_no, gender, Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name

(phone\_no is a multivaluated attribute)

**2NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name, user\_id

**3NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name , user\_id

***User is a RideSharer***

**UNF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, sharer\_age, sharer\_id

**1NF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, sharer\_age, sharer\_id

(NO multivaluated attribute)

**2NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd- sharer\_id, sharer\_age, user\_id

**3NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - sharer\_id, sharer\_age, user\_id

***User is a Rider***

**UNF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, Rider\_id, rider\_type

**1NF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, Rider\_id, rider\_type

(Rider\_Type is a multivaluated attributes)

**2NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - Rider\_id, rider\_type, user\_id

3rd - rider\_type\_id, rider\_type

**3NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - Rider\_id, rider\_type, user\_id

3rd - rider\_type\_id, rider\_type CREATE

***Company owns Account***

**UNF** - Comp\_id, Comp\_name, Comp\_address, Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name

**1NF** - Comp\_id, Comp\_name, Comp\_address, Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name

(no multivaluated attributes)

**2NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Account\_No, acc\_type, accHldr\_name, Bank\_Name, Branch\_Name, Comp\_id

**3NF** - 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Account\_No, acc\_type, accHldr\_name, Bank\_Name, Branch\_Name, Comp\_id

***Company has Vehicles***

**UNF** - Comp\_id, Comp\_name, Comp\_address, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

**1NF** - Comp\_id, Comp\_name, Comp\_address, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

(no multivaluated attributes)

**2NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, comp\_id

**3NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, comp\_id

***Company has Drivers***

**UNF** - Comp\_id, Comp\_name, Comp\_address, Drivers\_id, Driver\_name, phone\_no, vehicle\_id

**1NF** - Comp\_id, Comp\_name, Comp\_address, Drivers\_id, Driver\_name, phone\_no, vehicle\_id

(no multivaluated attributes)

**2NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Drivers\_id, Driver\_name, phone\_no, vehicle\_id ,comp\_id

**3NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - Drivers\_id, Driver\_name, phone\_no, vehicle\_id ,comp\_id

***Company gets Payings***

**UNF** - Comp\_id, Comp\_name, Comp\_address, CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount,

**1NF** - Comp\_id, Comp\_name, Comp\_address, CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount,

(no multivaluated attributes)

**2NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, comp\_id

**3NF** – 1st - Comp\_id, Comp\_name, Comp\_address

2nd - CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, comp\_id

***OwnGarage has Vehicles***

**UNF** - garagee\_id, garage\_name, Address, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

**1NF** - garagee\_id, garage\_name, Address, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

(no multivaluated attributes)

**2NF** – 1st - garage\_id, garage\_name, Address

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, garage\_id

**3NF** – 1st - garage\_id, garage\_name, Address

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, garage\_id

***OwnGarage*** ***has Drivers***

**UNF** - garage\_id, garage\_name, Address, Drivers\_id, Driver\_name, phone\_no

**1NF** - garage\_id, garage\_name, Address, Drivers\_id, Driver\_name, phone\_no

(no multivaluated attributes)

**2NF** – 1st - garagee\_id, garage\_name, Address

2nd - Drivers\_id, Driver\_name, phone\_no, garage\_id

**3NF** – 1st - garage\_id, garage\_name, Address

2nd - Drivers\_id, Driver\_name, phone\_no, garage\_id

***Drivers drives Vehicle***

**UNF** - Drivers\_id, Driver\_name, phone\_no, vehicle\_id, vehicle\_model, vehicle\_re, vehicle\_type, base\_rate, vehicle\_brand

**1NF** - Drivers\_id, Driver\_name, phone\_no, vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand

(no multivaluated attributes)

**2NF** – 1st - Drivers\_id, Driver\_name, phone\_no, Vehicle\_id

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg , vehicle\_type, base\_rate, vehicle\_brand

**3NF** – 1st - Drivers\_id, Driver\_name, phone\_no , Vehicle\_id

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand

***Drivers gets Paid***

**UNF** - Drivers\_id, Driver\_name, phone\_no, CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount,

**1NF** - Drivers\_id, Driver\_name, phone\_no, CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount,

(no multivaluated attributes)

**2NF** – 1st - Drivers\_id, Driver\_name, phone\_no

2nd - CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, Drivers\_id

**3NF** – 1st - Drivers\_id, Driver\_name, phone\_no

2nd - CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, Drivers\_id

***User has Location***

**UNF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, loc\_id, zip\_code, longitude, latitude

**1NF** - user\_id, first\_name, last\_name, dob, address, email, phone\_no, gender, loc\_id, zip\_code, longitude, latitude

(no multivaluated attributes)

**2NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - loc\_id, zip\_code,mapgrid\_id

3rd – mapgrid\_id, longitude, latitude

**3NF** – 1st - user\_id, first\_name, last\_name, dob, address, email, phone\_id, gender

2nd - loc\_id, zip\_code,mapgrid\_id

3rd – mapgrid\_id, longitude, latitude

***Rider makes Payment***

**UNF** - Rider\_id, rider\_type, amount, payment\_time, acc\_type, Account\_no, payment\_id

**1NF** - Rider\_id, rider\_type, amount, payment\_time, acc\_type, Account\_no, payment\_id ( rider\_type is a multivaluated attribute)

**2NF** – 1st - Rider\_id, rider\_type\_id

2nd - payment\_id, amount, payment\_time, Account\_no, acc\_type, rider\_id

3rd - rider\_type\_id, rider\_type

**3NF** – 1st - Rider\_id, rider\_type\_id

2nd - payment\_id, amount, payment\_time, Account\_no, acc\_type, rider\_id

3rd - rider\_type\_id, rider\_type

***Rider books Trip***

**UNF** - Rider\_id, rider\_type, trip\_price, trip\_start\_time, trip\_end\_time, rider\_rating, driver\_rating, start\_loc\_id, end\_loc\_id, distance, trip\_id, driver\_id, driver\_phone\_no,driver\_name

**1NF** - Rider\_id, rider\_type, trip\_price, trip\_start\_time, trip\_end\_time, rider\_rating, driver\_rating, driver\_id, start\_loc\_id, distance, end\_loc\_id, trip\_id

( rider\_type is a multivaluated attribute)

**2NF** – 1st - Rider\_id, rider\_type\_id

2nd - trip\_id, trip\_price, trip\_start\_time, trip\_end\_time, rider\_rating, driver\_rating, driver\_id, start\_loc\_id, end\_loc\_id, driver\_id, rider\_id

3rd – driver\_id, driver\_phone\_no,driver\_name

5th - Rider\_id, trip\_id

6th- rider\_type\_id, rider\_type

**3NF** – 1st - Rider\_id, rider\_type\_id

2nd - trip\_id, trip\_price, trip\_start\_time, trip\_end\_time, rider\_rating, driver\_rating, driver\_id, start\_loc\_id, end\_loc\_id, driver\_id, rider\_id

3rd – driver\_id, driver\_phone\_no,driver\_name

5th - Rider\_id, trip\_id

6th- rider\_type\_id, rider\_type

***Rider has Offers***

**UNF** - Rider\_id, rider\_type, offer\_id, offer\_name, discount

**1NF** - Rider\_id, rider\_type, offer\_id, offer\_name, discount

( rider\_type is a multivaluated attribute)

**2NF** – 1st - Rider\_id, rider\_type\_id

2nd - offer\_id, offer\_name, discount

3rd - rider\_type\_id, rider\_type

4th -Rider\_offer\_id, Rider\_id, offer\_id

**3NF** – 1st - Rider\_id, rider\_type\_id

2nd - offer\_id, offer\_name, discount

3rd - rider\_type\_id, rider\_type

4th -Rider\_offer\_id, Rider\_id, offer\_id

***RideSharer is a Driver***

**UNF** – Sharer\_id, sharer\_age, Drivers\_id, Driver\_name, phone\_no,

**1NF** - Sharer\_id, sharer\_age, Drivers\_id, Driver\_name, phone\_no,

(no multivaluated attributes)

**2NF** – 1st - Sharer\_id, sharer\_age

2nd - Drivers\_id, Driver\_name, phone\_no, sharer\_id

**3NF** – 1st - Sharer\_id, sharer\_age

2nd - Drivers\_id, Driver\_name, phone\_no, sharer\_id

***RideSharer has Vehicle***

**UNF** - Sharer\_id, sharer\_age, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

**1NF** - Sharer\_id, sharer\_age, vehicle\_model, vehicle\_reg, Vehicle\_id, vehicle\_type, base\_rate, vehicle\_brand

(no multivaluated attributes)

**2NF** – 1st - Sharer\_id, sharer\_age

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, sharer\_id

**3NF** – 1st - Sharer\_id, sharer\_age

2nd - Vehicle\_id, vehicle\_model, vehicle\_reg, vehicle\_type, base\_rate, vehicle\_brand, sharer\_id

**Total Tables**

1. User\_id, first\_name, last\_name, dob, address, email, Phone\_id, gender
2. Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name , User\_id
3. User\_id, first\_name, last\_name, dob, address, email, Phone\_id, gender
4. Sharer\_id, Sharer\_age, User\_id
5. User\_id, first\_name, last\_name, dob, address, email, Phone\_id, gender
6. Rider\_id, Rider\_type, User\_id
7. Rider\_type\_id, Rider\_type
8. Comp\_id, Comp\_name, Comp\_address
9. Account\_No, acc\_type, accHldr\_name, Bank\_Name, Branch\_Name, Comp\_id
10. Comp\_id, Comp\_name, Comp\_address
11. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, comp\_id
12. Comp\_id, Comp\_name, Comp\_address
13. Driver\_id, Driver\_name, Phone\_no, Vehicle\_id ,comp\_id
14. Comp\_id, Comp\_name, Comp\_address
15. CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, comp\_id
16. Garage\_id, Garage\_name, Address
17. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, Garage\_id
18. Garage\_id, Garage\_name, Address
19. Driver\_id, Driver\_name, Phone\_no, Garage\_id
20. Driver\_id, Driver\_name, Phone\_no , Vehicle\_id
21. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand
22. Garage\_id, Garage\_name, Address
23. Driver\_id, Driver\_name, Phone\_no, Garage\_id
24. Driver\_id, Driver\_name, Phone\_no , Vehicle\_id
25. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand
26. Driver\_id, Driver\_name, Phone\_no
27. CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, Driver\_id
28. User\_id, first\_name, last\_name, dob, address, email, Phone\_id, gender
29. loc\_id, zip\_code,mapgrid\_id
30. mapgrid\_id, longitude, latitude
31. Rider\_id, Rider\_type\_id
32. payment\_id, amount, payment\_time, Account\_no, acc\_type, Rider\_id
33. Rider\_type\_id, Rider\_type
34. Rider\_id, Rider\_type\_id
35. Trip\_id, Trip\_price, Trip\_start\_time, Trip\_end\_time, Rider\_rating, Driver\_rating, Driver\_id, start\_loc\_id, end\_loc\_id, Driver\_id, Rider\_id
36. Driver\_id, Driver\_Phone\_no,Driver\_name
37. Rider\_id, Trip\_id
38. Rider\_type\_id, Rider\_type
39. Rider\_id, Rider\_type\_id
40. offer\_id, offer\_name, discount
41. Rider\_type\_id, Rider\_type
42. Rider\_offer\_id, Rider\_id, offer\_id
43. Sharer\_id, Sharer\_age
44. Driver\_id, Driver\_name, Phone\_no, Sharer\_id
45. Sharer\_id, Sharer\_age
46. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, Sharer\_id

**Final Tables**

1. User\_id, first\_name, last\_name, dob, address, email, Phone\_id, gender
2. Account\_No, acc\_type, accHldr\_name,Bank\_Name, Branch\_Name , User\_id
3. Sharer\_id, Sharer\_age, User\_id
4. Rider\_id, Rider\_type, User\_id
5. Rider\_type\_id, Rider\_type
6. Comp\_id, Comp\_name, Comp\_address
7. Account\_No, acc\_type, accHldr\_name, Bank\_Name, Branch\_Name, Comp\_id
8. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, comp\_id
9. Driver\_id, Driver\_name, Phone\_no, comp\_id
10. CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, comp\_id
11. Garage\_id, Garage\_name, Address
12. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, Garage\_id
13. Driver\_id, Driver\_name, Phone\_no, Garage\_id
14. Driver\_id, Driver\_name, Phone\_no , Vehicle\_id
15. CorporatePayment\_id, Corporatepayment\_time, CorporateAcc\_no, CorporateAmount, Sharer\_id
16. loc\_id, zip\_code,mapgrid\_id
17. mapgrid\_id, longitude, latitude
18. Rider\_id, Rider\_type\_id
19. payment\_id, amount, payment\_time, Account\_no, acc\_type, Rider\_id
20. Trip\_id, Trip\_price, Trip\_start\_time, Trip\_end\_time, Rider\_rating, Driver\_rating, Driver\_id, start\_loc\_id, end\_loc\_id, Driver\_id, Rider\_id
21. Rider\_id, Trip\_id
22. offer\_id, offer\_name, discount
23. Rider\_offer\_id, Rider\_id, offer\_id
24. Driver\_id, Driver\_name, Phone\_no, Sharer\_id
25. Vehicle\_id, Vehicle\_model, Vehicle\_reg, Vehicle\_type, base\_rate, Vehicle\_brand, Sharer\_id

**Table Creation**

CREATE TABLE users( user\_id NUMBER(10),

first\_name VARCHAR(15),

last\_name VARCHAR(15),

dob DATE,

address VARCHAR(100),

phone VARCHAR(11),

gender VARCHAR(10),

CONSTRAINT user\_id\_pk PRIMARY KEY(user\_id)

)

2.

CREATE TABLE Users\_Account(Account\_No VARCHAR(20) constraint Account\_No\_pk primary key

    acc\_type VARCHAR(15)

    accHldr\_name VARCHAR(25)

    Bank\_Name VARCHAR(35)

    Branch\_Name VARCHAR(30)

    user\_id NUMBER(10) CONSTRAINT users\_account\_id\_fk REFERENCES users(user\_id)

);

3.

CREATE TABLE ride\_sharer(sharer\_id NUMBER(10) constraint RIDE\_SHARER\_pk primary key

    sharer\_age NUMBER(2)

    user\_id NUMBER(10) CONSTRAINT sharer\_user\_id\_fk REFERENCES users(user\_id)

);

4.

CREATE TABLE rider(rider\_id NUMBER(10) constraint rider\_pk primary key,

rider\_type VARCHAR(20),

user\_id NUMBER(10) CONSTRAINT rider\_id\_fk REFERENCES users(user\_id)

);

5.

6.

CREATE TABLE company(comp\_id NUMBER(5) constraint COMP\_pk primary key

comp\_name VARCHAR(30)

comp\_address VARCHAR(100)

);

7.

CREATE TABLE Comp\_Account(Account\_No varchar(20) constraint Account\_No\_pk primary key,

acc\_type VARCHAR(15),

accHldr\_name VARCHAR(25),

Bank\_Name VARCHAR(35),

Branch\_Name VARCHAR(30),

Comp\_id VARCHAR(5) constraint comp\_account\_id\_fk references(comp\_id));

8.

CREATE TABLE company\_vehicle(vehicle\_id NUMBER(10) constraint comp\_vhcl\_pk primary key

    vehicle\_model VARCHAR(15),

    vehicle\_reg VARCHAR(15),

    vehicle\_type VARCHAR(15),

    base\_rate NUMBER(5),

    vehicle\_brand VARCHAR(15),

    comp\_id NUMBER(5) CONSTRAINT VEHICLE\_comp\_id\_fk REFERENCES company(comp\_id)

    );

9.

CREATE TABLE company\_driver(driver\_id NUMBER(10) constraint COMP\_driver\_pk primary key

    comp\_id NUMBER(5) CONSTRAINT driver\_comp\_id\_fk REFERENCES company(comp\_id)

    );

10.

CREATE TABLE corporate\_payment(CorporatePayment\_id NUMBER(10) constraint CORPORATE\_pk primary key,

    Corporatepayment\_time VARCHAR(30) ,

    Corporate\_Acc\_no VARCHAR(15) ,

    CorporateAmount NUMBER(10) ,

    comp\_id NUMBER(5) CONSTRAINT CORPORATE\_id\_fk REFERENCES company(comp\_id)

    );

11.

CREATE TABLE garage( garage\_id NUMBER(5) constraint garage\_pk primary key,

    garage\_name VARCHAR(20),

    Address VARCHAR(50),

    );

12.

CREATE TABLE garage\_vehicle(vehicle\_id NUMBER(10),

    vehicle\_model VARCHAR(15),

    vehicle\_reg VARCHAR(15),

    vehicle\_type VARCHAR(15),

    base\_rate NUMBER(5),

    vehicle\_brand VARCHAR(15),

    garage\_id NUMBER(5) CONSTRAINT VEHICLE\_garage\_id\_fk REFERENCES garage(garage\_id)

    );

13.

CREATE TABLE garage\_driver(driver\_id NUMBER(10) constraint gd\_pk primary key

    garage\_id NUMBER(5) CONSTRAINT driver\_garage\_id\_fk REFERENCES garage(garage\_id)

    );

14.

CREATE TABLE vehicle\_driver(driver\_id NUMBER(10) constraint vd\_pk primary key

    vehicle\_id NUMBER(10) CONSTRAINT vehicle\_driver\_id\_fk REFERENCES company\_vehicle(vehicle\_id)

    );

15.

create table CORPORATE\_PAYMENT\_sharer(Corporate\_Payment\_id VARCHAR(10),

    Corporate\_payment\_time VARCHAR(20),

    Corporate\_Acc\_no VARCHAR(17),

    Corporate\_Amount NUMBER(15),

    Sharer\_id NUMBER(10) CONSTRAINT CP\_SHARER\_fk REFERENCES ride\_sharer(sharer\_id),

    CONSTRAINT CORPORATE\_PAYMENT\_ID\_KEY PRIMARY KEY(Corporate\_Payment\_id)

    );

16.

create table LOCATION(loc\_id VARCHAR(10) NOT NULL,

    zip\_code VARCHAR(5),

    mapgrid\_id VARCHAR(10) CONSTRAINT loc\_fk REFERENCES MAP(mapgrid\_id),

    CONSTRAINT loc\_id\_KEY PRIMARY KEY(loc\_id)

   );

17.

create table MAP(mapgrid\_id VARCHAR(10) NOT NULL ,

    longitude NUMBER(3,6),

    latitude NUMBER(3,6) ,

    CONSTRAINT mapgrid\_id\_KEY PRIMARY KEY(mapgrid\_id)

   );

18.

CREATE TABLE Payment( Payment\_ID NUMBER(1,10) not null,

    Payment\_Time VARCHAR(20),

    Amount VARCHAR(9),

    Rider\_ID NUMBER(10) constraint rider\_pay\_fk REFERENCES RIDER(rider\_id),

    Account\_No VARCHAR(15),

    Acc\_Type VARCHAR(5),

    constraint Payment\_pk primary key (Payment\_ID)

    );

19.

20.

CREATE TABLE Trip( Trip\_ID NUMBER(10) not null,

    Trip\_Price VARCHAR(9),

    Trip\_Start\_Time VARCHAR(15),

    Trip\_End\_Time VARCHAR(15),

    Start\_Loc\_ID VARCHAR(10),

    End\_Loc\_ID VARCHAR(10),

    vehicle\_ID NUMBER(10) constraint trip\_vehicle\_fk REFERENCES vehicle(vehicle\_id),

    Driver\_Rating VARCHAR(10),

    Rider\_ID NUMBER(10) constraint trip\_rider\_fk REFERENCES rider(rider\_id),

    Rider\_Rating VARCHAR(10),

    constraint Trip\_pk primary key (Trip\_ID)

    );

21.

22.

CREATE TABLE Offers(Offers\_ID NUMBER(4) not null,

    Offers\_Name VARCHAR(10),

    Discount NUMBER(3),

    constraint Offers\_pk primary key (Offers\_ID)

    );

22.

CREATE TABLE Rider\_Offers(Rider\_Offers\_ID NUMBER(5) not null,

    Offers\_ID NUMBER(4) constraint offr\_id\_fk REFERENCES offers(offers\_id),

    Rider\_ID NUMBER(10) constraint rdr\_id\_fk REFERENCES rider(rider\_id),

    constraint Rider\_Offers\_pk primary key (Rider\_Offers\_ID)

    );

23.

24.

CREATE TABLE Driver(Driver\_ID VARCHAR(7) not null,

    Sharer\_ID NUMBER(8) constraint sharer\_driver\_fk REFERENCES ride\_sharer(sharer\_id),

    constraint Driver\_pk primary key (Driver\_ID)

    );

25.

CREATE TABLE sharer\_vehicle(vehicle\_id NUMBER(10),

    vehicle\_model VARCHAR(15),

    vehicle\_reg VARCHAR(15),

    vehicle\_type VARCHAR(15),

    base\_rate NUMBER(5),

    vehicle\_brand VARCHAR(15),

    sharer\_id NUMBER(5) CONSTRAINT VEHICLE\_sharer\_id\_fk REFERENCES ride\_sharer(sharer\_id)

    );

**Value Insertion**

**1.Company**

CREATE SEQUENCE comp\_seq

start with 60

increment by 10

minvalue 60

maxvalue 200

nocycle nocache;

INSERT INTO company values(comp\_seq.nextval, 'Eagle One Delivery','katasur, sher-e-bangla road, mohammadpur, 1207');

INSERT INTO company values(comp\_seq.nextval, 'First Call Auto','dhonanjoypur, ashulia, savar, 1340');

INSERT INTO company values(comp\_seq.nextval, 'N-Motion Auto','home town, (10th floor), bangla motor, 1000');

INSERT INTO company values(comp\_seq.nextval, 'Total Quality','road # 4, block - a, mirpur - 11, 1218');

INSERT INTO company values(comp\_seq.nextval, 'Only Logistic','block - c, banasree, east rampura, 1219');

INSERT INTO company values(comp\_seq.nextval, 'National Carrier Inc','Medona Tower (8th Floor), 28 Mohakhali C/A, P.O. Box: 1212');

**8.Company\_vehicle**

INSERT INTO COMPANY\_VEHICLE('2334', 'auris','5/8/2009','Micro',500,'toyota',70);

INSERT INTO COMPANY\_VEHICLE('3456','swift','7/2/2012','Subcompact',    240,'suzuki',80);

INSERT INTO COMPANY\_VEHICLE('5672', 'ibiza','4/6/2010','Sedan',567,'seat',60);

INSERT INTO COMPANY\_VEHICLE('5681', 'Hyundai Aura','3/9/2010','Sedan',643,'Hyundai',60);

INSERT INTO

COMPANY\_VEHICLE('6781', 'Nissan Quest','7/2/2003','Minivan',672,'Nissan',110);

INSERT INTO

COMPANY\_VEHICLE('6789', 'Toyota Prius','4/1/2011','Sedan',567,'ford',60);

**comp\_driver\_seq**

CREATE SEQUENCE comp\_driver\_seq start with 100 increment by 2 minvalue 60

 maxvalue 200 nocycle nocache;

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 70);

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 60);

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 70);

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 60);

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 80);

INSERT INTO company\_driver values(comp\_driver\_seq.nextval, 110);

**USERS**

CREATE SEQUENCE user\_seq start with 100000 increment by 2 minvalue 100000  maxvalue 99990000 nocycle nocache;

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Fardin','Tasfin',TO\_DATE('03/08/1995', 'mm/dd/yyyy'), 'fardin.tasfin@gmail.com','01773299857','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'md','Seaam',TO\_DATE('10/12/1997', 'dd/mm/yyyy'),'md.seaam@gmail.com','01895642625','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Maruf','Rafi',TO\_DATE('07/01/2000', 'dd/mm/yyyy'),'maruf.rafi@gmail.com','01764054545','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Arif','ASHIK',TO\_DATE('05/11/1995', 'dd/mm/yyyy'),'arif.ashik@gmail.com','01789394070','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Rifat','sayeed',TO\_DATE('10/10/1999', 'dd/mm/yyyy'),'rifat.sayeed@gmail.com','01586713739','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Mohammad',' Rubel',TO\_DATE('03/09/1997','dd/mm/yyyy'),'mohammad.rubel@gmail.com',

'0194597536','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'swapnil','Nazir',TO\_DATE('11/2/2017', 'dd/mm/yyyy'),'swapnil.nazir@gmail.com','01770245982','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Atif','SIAM',TO\_DATE('01/12/2003', 'dd/mm/yyyy'),'atif.siam@gmail.com','01561732077','Male');

INSERT INTO USERS VALUES (USER\_SEQ.NEXTVAL,'Salman','hridoy',TO\_DATE('5/4/1999', 'dd/mm/yyyy'),'salman.hridoy@gmail.com','01561732078','Male');

**RIDER**

CREATE SEQUENCE RIDER\_SEQ start with 100000 increment by 2 minvalue 100000  maxvalue 99990000 nocycle nocache;

INSERT INTO rider VALUES (rider\_seq.NEXTVAL,'SILVER',10004);

INSERT INTO rider VALUES (rider\_seq.NEXTVAL,'GOLD',10004);

INSERT INTO rider VALUES (rider\_seq.NEXTVAL,'SILVER',10005);

INSERT INTO rider VALUES (rider\_seq.NEXTVAL,'BRONZE',10003);

INSERT INTO rider VALUES (rider\_seq.NEXTVAL,'SILVER',10004);

**CORPORATE\_PAYMENT**

INSERT INTO corporate\_payment VALUES(4449,'2022-04-30 14:53:27', '0094676167923',1265000,60);

INSERT INTO corporate\_payment VALUES(1192,'2022-05-30 14:33:27', '00459546105951',456619,70);

INSERT INTO corporate\_payment VALUES(5620,'2022-06-13 11:02:12', '00378101817920',117901,90);

INSERT INTO corporate\_payment VALUES(9232,'2022-11-15 15:44:17', '00607450408991',807877,100);

INSERT INTO corporate\_payment VALUES(9464,'2021-09-18 17:06:11', '01202093996046',894571,70);

INSERT INTO corporate\_payment VALUES(3483,'2022-01-21 17:38:22', '00543774605356',169427,60);

INSERT INTO corporate\_payment VALUES(5254,'2022-02-05 11:30:40', '003382786769',238880,100);

INSERT INTO corporate\_payment VALUES(7261,'2021-08-16 19:20:37', '00864416451720',668041,70);

INSERT INTO corporate\_payment VALUES(1098,'2021-12-06 10:12:19', '0094676167923',960811,90);

**COMP\_ACCOUNT**

INSERT INTO COMP\_ACCOUNT VALUES ('00950201003772432','Savings','shamim ahnaf','Agrani Bank Limited','Bahaddarhat',70);

INSERT INTO COMP\_ACCOUNT VALUES ('00950201045712432','Savings','fardin tasfin','Bangladesh Development Bank','Barisal',60);

INSERT INTO COMP\_ACCOUNT VALUES ('00960201201022432','Savings','md seaam','BASIC Bank Limited','Bogra',70);

INSERT INTO COMP\_ACCOUNT VALUES ('00970201204362432','Savings','maruf rafi','Janata Bank Limited','Ashuganj',110);

INSERT INTO COMP\_ACCOUNT VALUES ('00980201303182432','Savings','arif ashik','Rupali Bank Limited','Brahmanbaria',70);

INSERT INTO COMP\_ACCOUNT VALUES ('00940207002562432','Savings','rifat sayeed','Sonali Bank Limited','Chandpur',60);

INSERT INTO COMP\_ACCOUNT VALUES ('01000201501302432','Savings','mohammad rubel','Agrani Bank Limited','ChapaiNawabganj',60);

INSERT INTO COMP\_ACCOUNT VALUES ('01010201504932432','Savings','swapnil nazir','Bangladesh Development Bank','Agrabad',80);

INSERT INTO COMP\_ACCOUNT VALUES ('00960201507982432','Savings','atif siam','BASIC Bank Limited','Anderkilla',80);

**RIDE\_SHARER**

CREATE SEQUENCE RIDE\_SHARER\_SEQ start with 5000 increment by 2 minvalue 10000 maxvalue 99990000 nocycle nocache;

INSERT INTO RIDE\_SHARER VALUES (RIDE\_SHARER\_SEQ.NEXTVAL,20,100042);

INSERT INTO RIDE\_SHARER VALUES (RIDE\_SHARER\_SEQ.NEXTVAL,28,100044);

INSERT INTO RIDE\_SHARER VALUES (RIDE\_SHARER\_SEQ.NEXTVAL,35,100048);

INSERT INTO RIDE\_SHARER VALUES (RIDE\_SHARER\_SEQ.NEXTVAL,45,100050);

INSERT INTO RIDE\_SHARER VALUES (RIDE\_SHARER\_SEQ.NEXTVAL,99,100040);

**corporate\_payment\_SHARER**

INSERT INTO corporate\_payment\_SHARER VALUES(4440,'2022-04-31 10:53:27', '0094676167923',26500,10000);

INSERT INTO corporate\_payment\_SHARER VALUES(1190,'2022-05-31 10:33:27', '00459546105951',5660,10002);

INSERT INTO corporate\_payment\_SHARER VALUES(5620,'2022-06-11 10:02:12', '00378101817920',1790,10004);

INSERT INTO corporate\_payment\_SHARER VALUES(9230,'2022-11-11 10:44:17', '00607450408991',1780,10006);

INSERT INTO corporate\_payment\_SHARER VALUES(9460,'2021-09-11 10:06:11', '01202093996046',9450,10008);

INSERT INTO corporate\_payment\_SHARER VALUES(3480,'2022-01-21 10:38:22', '00543774605356',6940,10006);

**DRIVER**

CREATE SEQUENCE DRIVER\_SEQ start with 10000 increment by 2 minvalue 10000  maxvalue 1990000 nocycle nocache;

INSERT INTO driver VALUES(DRIVER\_SEQ.NEXTVAL,10000);

INSERT INTO driver VALUES(DRIVER\_SEQ.NEXTVAL,10002);

INSERT INTO driver VALUES(DRIVER\_SEQ.NEXTVAL,10004);

INSERT INTO driver VALUES(DRIVER\_SEQ.NEXTVAL,10006);

INSERT INTO driver VALUES(DRIVER\_SEQ.NEXTVAL,10008);

**GARAGE\_DRIVER**

CREATE SEQUENCE G\_DRIVER\_SEQ start with 10000 increment by 2 minvalue 10000  maxvalue 1990000 nocycle nocache;

INSERT INTO GARAGE\_DRIVER VALUES(G\_DRIVER\_SEQ.NEXTVAL,5024);

INSERT INTO GARAGE\_DRIVER VALUES(G\_DRIVER\_SEQ.NEXTVAL,5018);

INSERT INTO GARAGE\_DRIVER VALUES(G\_DRIVER\_SEQ.NEXTVAL,5020);

INSERT INTO GARAGE\_DRIVER VALUES(G\_DRIVER\_SEQ.NEXTVAL,5030);

INSERT INTO GARAGE\_DRIVER VALUES(G\_DRIVER\_SEQ.NEXTVAL,5034);

**Conclusion**

We investigate the potential benefits of introducing meeting points in a ride-sharing system. With meeting points, riders can be picked up and dropped off either at their origin and destination or at a meeting point that is within a certain distance from their origin or destination. The increased flexibility results in additional feasible matches between drivers and riders, and allows a driver to be matched with multiple riders without increasing the number of stops the driver needs to make. We design and implement an algorithm that optimally matches drivers and riders in large-scale ride-sharing systems with meeting points. We perform an extensive simulation study to assess the benefits of meeting points. The results demonstrate that meeting points can significantly increase the number of matched participants as well as the system-wide driving distance savings in a ride-sharing system.