Transportation Database Project

2020/2021

Outline

Part A: Application of the Database

Begin by choosing an application.

Description:
The Transportation Company management system revolves around a lot of information and data. The application of the database can help the company to manage the data more easily. Transportation companies mainly provide services to production companies that need to transport their goods to the retailers. In more detail, after the transportation company generates an order with the production company, the goods will be sent to a specific location and the logistics information will be recorded accordingly and be updated in real-time. It can be seen from this that transportation is directly related to the retailer, so the logistics data will be concerned with the retailer's information to confirm the information when the retailer signs for the goods and make them be able to inquire about the dynamics of the logistics. Usually, the transportation company establishes records of the customers' information, that is, the production companies' information. What's more, the transportation part of the company consists of its fleet and drivers whose information should also be put into the database. Hence, the goal of this database is applied to help handle the connections among the several characters and manage the information generated in the course of business.

Part B: Assumptions to the Database

Specify the assumptions about the database in English (informally).

Description:
We would like to construct 7 entity sets and 6 relationship sets. In part B, we will give the proper explanation of the attributes, keys, the nature of relationships between entities, etc.

For Entities

1.Producer_company: with attributes(<u>producer_name</u>, producer_address, producer_tel)

a.We assume 'producer_name' as the distinct company name because there is no the same name of different companies.
b.Attribute 'producer_address' is a descriptive attribute without the restrictions of fixed format.
c.Attribute 'producer_tel' should be one fixed attribute. If one company has several phone numbers, one of them should be chosen.
d. One producer company should have one distinct address.

2.Orders: with attributes(<u>order_num</u>, good, expense)

a.Relation set 'Orders' is the orders between producer company and transportation company.
b.Attribute 'Good' is the type of goods.
c.Attribute 'expense' should be bigger than 0. The measurement unit of 'expense' is 'MOP'

3.Track: with attributes(<u>tracking_num</u>, start_date, start_time, arrive_date, arrive_time, start_address, arrive_address, complete)

a. Attribute 'tracking_num' is a distinct number to track different vehicles loaded with goods on each order.
b. Attributes 'start_time' and 'arrive_time' provide information at what times, a particular transport starts and ends. The attributes should be in the form of '11:00:00'.
c. Attribute 'arrive_time' can have null value because there may exist non-arrival goods.
d. Attributes 'start_date' and 'arrive_date' provide information at which dates a particular transport starts and ends. The attributes should be in the form of '2021-03-14'.
e. Attribute 'arrive_date' can have null value because there may exist non-arrival goods.
f. Attributes 'start_address' and 'arrive_address' are descriptive attributes without the restrictions of fixed format.
g. Attribute 'complete' is to describe whether a transportation is finished. The attributes should be between 'T' and 'F'.

4.Diver: with attributes(<u>driver_id</u>, driver_name, gender, driver_age, driver_tel, driver_address, license_type, salary, working_years, driver_free)

a.The attribute 'gender' should be between 'M' and 'F'.
b. Attribute 'age' should be more than 16, and less than 65.

c.Attribute ‘driver_address’ is a descriptive attribute without the restrictions of fixed format and one driver should have one distinct address.
d.Attribute ‘driver_tel’ should be one fixed attribute. If a person has several phone numbers, one of them should be chosen.
e.Attribute ‘driver_address’ is a descriptive attribute without the restrictions of fixed format.
f.We assume the attribute ‘salary’ should be at least 6000MOP depending on one month.
g.Attribute ‘driver_free’ is to describe whether the driver is driving. The attributes should be between ‘T’ and ‘F’.

5.Retailer_company: with attributes(<u>retailer_name</u>, retailer_address, retailer_tel)
a.We assume ‘retailer_name’ as the distinct company name because there is no the same name of different companies.
b.Attribute ‘retailer_address’ is a descriptive attribute without the restrictions of fixed format.
c.Attribute ‘retailer_tel’ should be one fixed attribute. If one company has several phone numbers, one of them should be chosen.
d. One retailer company should have one distinct address.

6.Vehicle: with attributes(<u>license_num</u>, vehicle_free)
Attribute ‘vehicle_free’ is to describe whether the vehicle is in the process of transportation. The attributes should be between ‘T’ and ‘F’.

7.Vehicle_type: with attributes(<u>brand</u>, <u>model</u>, loads, fuel, insurance)
a.The attributes ‘brand’ and ‘model’ together should be a primary key of this entity set.
b.Attributes ‘loads’, ‘fuel’, ‘insurance’ should be bigger than 0. The measurement unit of loads is ‘t’. The measurement unit of fuel is ‘L’.

For relationships

1. order_producer: with attributes(order_num, producer_name)
This relationship connects entity Order and entity Producer_company. The mapping cardinality of this relationship should be many to one, and entity set Orders should be total participation. Because in this system an order belongs to only one producer company, but a producer company can have multiple orders.

2.transport: with attributes(order_num, tracking_num)

This relationship connects entity Orders and entity Track. The mapping cardinality of this relationship should be one to many, and the entity Track should be total participation. Because in this system one delivery only corresponds to one order, but the goods of an order may be delivered in several batches.

3.drive: with attributes(tracking_num, drive_id)

This relationship connects entity Track and entity Driver. The mapping cardinality of this relationship should be many to one, and entity Track should be total participation. Because here one delivery must match one driver, but a driver may have done several delivery tasks.

4.track_retailer: with attributes(tracking_num, retailer_name)

This relationship connects entity Track and entity Retailer_company. The mapping cardinality of this relationship should be many to one, and entity Track should be total participation. Because here one delivery must match one retailer, but for a retailer, they may sign for several deliveries.

5.tool: with attributes(tracking_num, license_num)

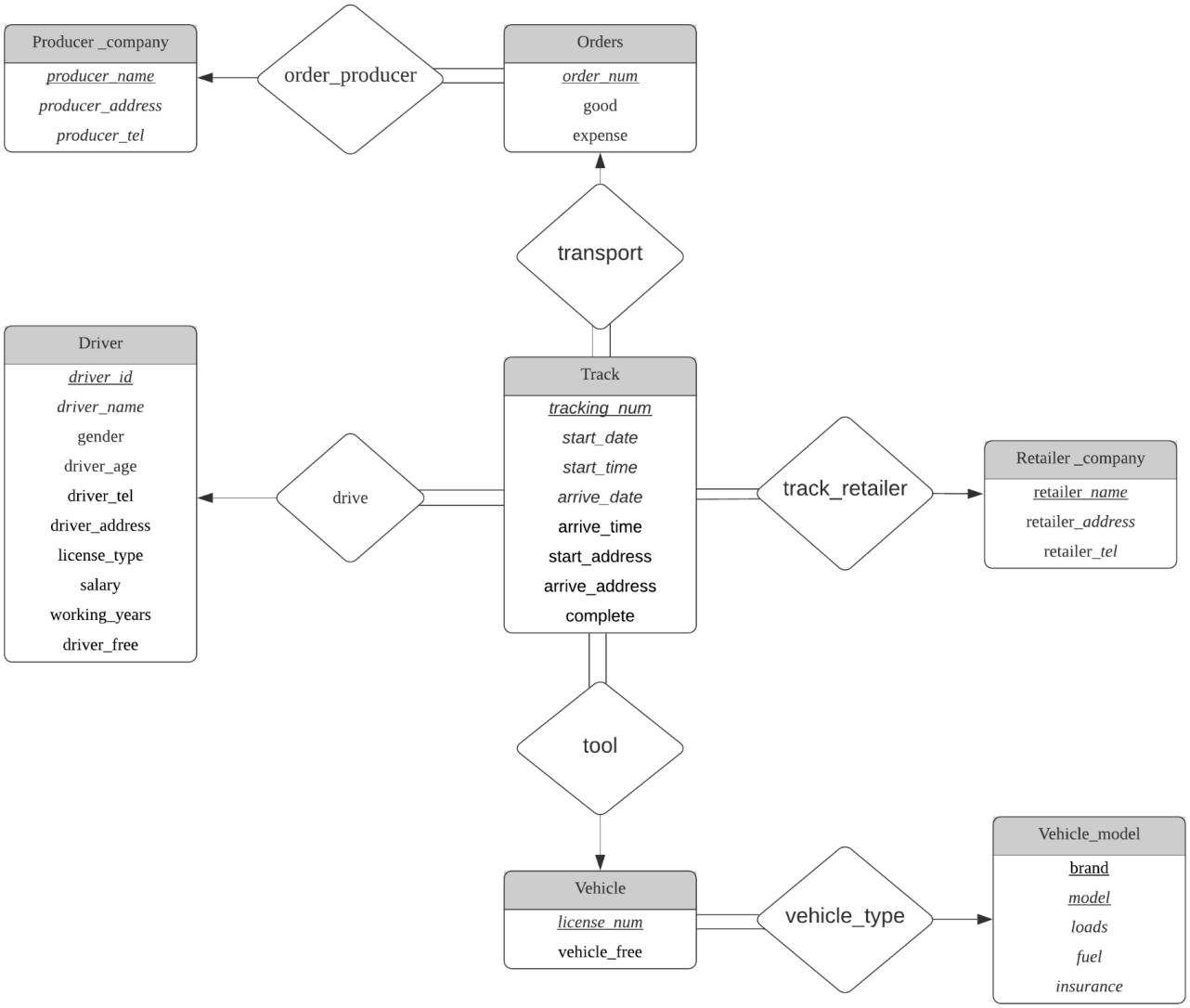
This relationship connects entity Track and entity Vehicle. The mapping cardinality of this relationship should be many to one, and entity Track should be total participation. Because here one delivery must match one vehicle, but for a vehicle, it may be used in many transportation tasks.

6.vehicle_type: with attributes(license_num, brand, model)

This relationship connects entity Vehicle and entity Vehicle_type. The mapping cardinality of this relationship should be many to one, and entity Vehicle should be a total participation. Because here we assume one vehicle can only belong to one vehicle model. The vehicle model here shows its brand and its model under this brand. But the company may own multiple cars of the same vehicle model.

Part C: E-R diagram

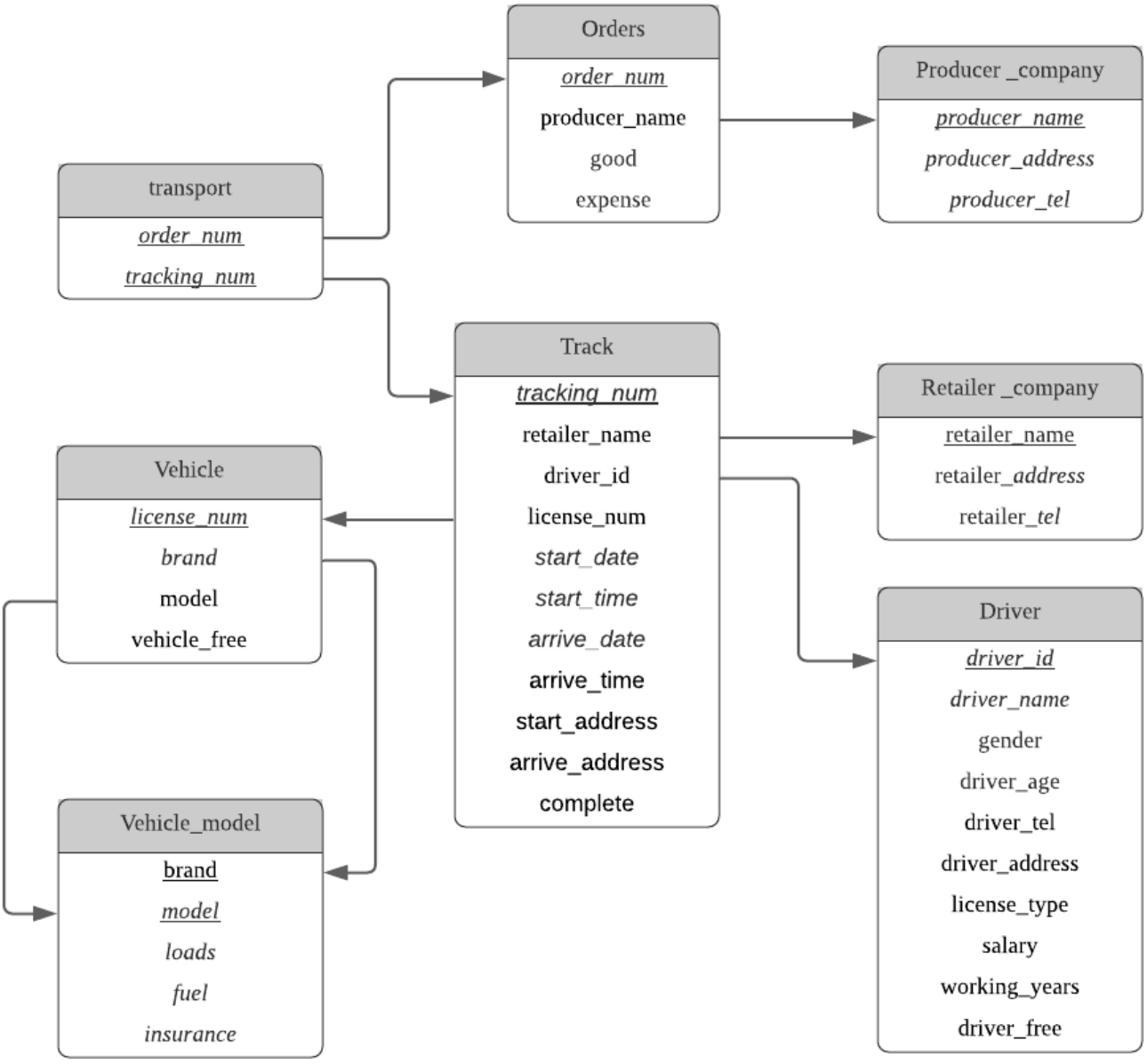
construct an E-R diagram



order_producer (producer_name,order_num)
transport(order_num,tracking_num)
drive(driver_id,tracking_num)
track_retailer(retailer_name,tracking_num)
tool(license_num,tracking_num)
vehicle_type(license_num,brand,model)

Part D: Relational database schema

Convert the E-R diagram into a relational database schema



Part E: SQL (DDL + DML)

i) SQL Statements for creating tables

- Producer_company

```
create table Producer_company
      (producer_name          varchar(20),
     producer_address       varchar(50),
      producer_telephone     varchar(15),
      primary key (producer_name)
);
```

- Retailer_company

```
create table Retailer_company
      (retailer_name          varchar(20),
      retailer_address        varchar(50),
      retailer_telephone     varchar(15),
      primary key (retailer_name)
);
```

- Driver

```
create table Driver
 (driver_id        varchar(10),
  driver_name      varchar(20),
  gender           varchar(4),
  driver_age       numeric(3,0)
                   check (driver_age > 16 and driver_age < 65),
  driver_tel       varchar(15),
  driver_address   varchar(50),
  license_type     varchar(15),
  salary           numeric(7,2) check (salary >= 6000.00),
  working_years    numeric(3,0),
  driver_free      varchar(3),
  primary key (driver_id)
);
```

- Vehicle_model

```
create table Vehicle_model
      (brand      varchar(15),
```

```
      model      varchar(10),
      loads      numeric(5,1) check(loads>0),
      fuel       numeric(6,1) check(fuel>0),
      insurance  numeric(7,1) check(insurance>0),
      primary key (brand,model)
);
```

- Vehicle

```
create table Vehicle
     (license_num    varchar(15),
        brand        varchar(15),
        model        varchar(10),
      vehicle_free    varchar(3),
     primary key (license_num),
     foreign key (brand,model) references
Vehicle_type(brand,model)
     on delete cascade
);
```

- Orders

```
create table Orders
     (order_num      varchar(10),
      producer_name   varchar(20),
      good            varchar(20),
      expense        numeric(6,2) check (expense>0) ,
      primary key (order_num),
      foreign key (producer_name) references
Producer_company(producer_name)on delete cascade
);
```

- Track

```
create table Track
   (tracking_num              varchar(15),
    retailer_name         varchar(20),
    driver_id             varchar(10),
    license_num          varchar(15),
    start_date            date,
    start_time            time,
    arrive_date           date null,
    arrive_time           time null,
    start_address         varchar(50),
    arrive_address        varchar(50),
    complete              varchar(3),
    primary key (tracking_num),
```

```
    foreign key (retailer_name ) references
Retailer_company(retailer_name),
    foreign key (driver_id) references Driver(driver_id),
    foreign key (license_num) references Vehicle(license_num)
);
```

- transport

```
create table transport
     (order_num      varchar(10),
      tracking_num   varchar(15),
      primary key (order_num,tracking_num),
      foreign key (order_num) references Orders (order_num),
      foreign key (tracking_num) references Track(tracking_num)
);
```

ii-a) SQL Statements for inserting tables

The following are screen captures of the SQL statements.

- Producer_company

```
insert into Producer_company values ('1st seller','3724 Jackson St.','28880001');
insert into Producer_company values ('Sky Land','9530 5th Avenue','28883579');
insert into Producer_company values ('Seas Fish','1222 Queen St.','28663579');
insert into Producer_company values ('O.N.','9820 5th Avenue','28879555');
insert into Producer_company values ('COMPOLOP','467 Clover Drive','28880111');
insert into Producer_company values ('TASCO','3344 Jackson St.','28009999');
insert into Producer_company values ('earth-like','411 Clover Drive','28886666');
insert into Producer_company values ('OLF','67 7th Avenue','28883301');
insert into Producer_company values ('Vanky','36 7th Avenue','28888966');
insert into Producer_company values ('StyleBox','1820 5th Avenue','28858273');
```

- Retailer_company

```
insert into Retailer_company values ('1st seller','3724 Jackson St.','28880001');
insert into Retailer_company values ('Oral','1 Crown Av.','28671536');
insert into Retailer_company values ('Canned','Block5 Gold Plaza.','28663579');
insert into Retailer_company values ('Partition','Block20 Gold Plaza','28991837');
insert into Retailer_company values ('Macy','Gold Plaza','28993887');
insert into Retailer_company values ('TASCO','3344 Jackson St.','28009999');
insert into Retailer_company values ('USPS','Central Gov. Proverty','18001234567');
insert into Retailer_company values ('OLF','67 7th Avenue','28883301');
insert into Retailer_company values ('Vanky','36 7th Avenue','28888966');
insert into Retailer_company values ('WiCash','1820 5th Avenue','28858273');
```

- Driver

```
insert into Driver values ('E0001','XWQ','M',55,'68880001','552 B Av.','Probationary','9000.00','1','T');
insert into Driver values ('E3578','Alan','M',30,'68875467','721 Hills St.','Commercial','20000.00','3','F');
insert into Driver values ('E8940','Leo','M',25,'68829375','45 B Av.','Commercial','20300.00','2','T');
insert into Driver values ('E2738','Marcus','M',25,'68980771','1123 Albertson St.','Commercial','22000.00','1','T');
insert into Driver values ('E3931','Philip','M',36,'68872937','424 Clover Drive','Private','10300.00','9','T');
insert into Driver values ('E1839','Roy','M',29,'68894923','9304 Jackson St.','Private','13000.00','2','F');
insert into Driver values ('E2938','Nick','M',28,'66009001','712 Hills St.','Commercial','18900.00','1','F');
insert into Driver values ('E8986','Helen','F',39,'68872001','4293 Queen St.','Private','17700.00','12','T');
insert into Driver values ('E2579','Ivy','M',40,'68888901','467 Clover Drive','Commercial','30000.00','17','F');
insert into Driver values ('E6798','Jane','F',47,'68887806','90 7th Avenue','Commercial','26700.00','10','F');
```

- Vehicle_model

```
insert into Vehicle_model values ('Kenworth','T880','1.8','50.0','50000.0');
insert into Vehicle_model values ('FREIGHTLINER','eM2','8.0','65.0','70000.0');
insert into Vehicle_model values ('Kenworth','W990','10.0','69.0','90000.0');
insert into Vehicle_model values ('MACK','LR','1.6','35.0','30000.0');
insert into Vehicle_model values ('FREIGHTLINER','Cascadia','15.0','80.5','100000.0');
insert into Vehicle_model values ('FREIGHTLINER','122SD','2.0','51.0','55000.0');
insert into Vehicle_model values ('MACK','Anthem','1.8','49.0','50000.0');
insert into Vehicle_model values ('MACK','Granite','3.8','55.0','58000.0');
insert into Vehicle_model values ('FREIGHTLINER','108SD','9.0','69.0','83000.0');
insert into Vehicle_model values ('Kenworth','T680','1.6','48.0','30000.0');
```

- Vehicle

```
insert into Vehicle values ('V0001','Kenworth','T880','T');
insert into Vehicle values ('V3579','FREIGHTLINER','eM2','T');
insert into Vehicle values ('V2468','Kenworth','W990','F');
insert into Vehicle values ('V0009','MACK','LR','T');
insert into Vehicle values ('V0123','FREIGHTLINER','Cascadia','F');
insert into Vehicle values ('V0778','FREIGHTLINER','122SD','F');
insert into Vehicle values ('V0034','MACK','Anthem','F');
insert into Vehicle values ('V0140','MACK','Granite','F');
insert into Vehicle values ('V0012','FREIGHTLINER','108SD','T');
insert into Vehicle values ('V0999','Kenworth','T680','F');
```

- Orders

```
insert into Orders values ('90001','1st seller','Pipes',25.50);
insert into Orders values ('90247','Seas Fish','Canned Fish',33.00);
insert into Orders values ('92469','1st seller','Cups',10.00);
insert into Orders values ('92498','OLF','Skin Care',99.00);
insert into Orders values ('90092','StyleBox','Clothing',399.00);
insert into Orders values ('90293','O.N.','Newspapers',1.00);
insert into Orders values ('90986','TASCO','Optical Instruments',4999.00);
insert into Orders values ('90423','earth-like','Softwares',499.50);
insert into Orders values ('90065','Seas Fish','Cat Food',9.00);
insert into Orders values ('90078','COMPOLOP','Batteries',12.00);
insert into Orders values ('90238','OLF','Skin Care',78.00);
```

- Track

```
insert into Track values ('T0101','1st seller','E2579','V0123','2021-01-01', '11:00:00', '2021-01-03','09:30:00','South Factory','3724 Jackson St.','T');
insert into Track values ('T0356','Canned','E1839','V0034','2021-03-14', '21:00:00', '2021-03-20','11:00:00','1222 Queen St.','Block5 Gold Plaza.','T');
insert into Track values ('T0257','1st seller','E3931','V0140','2021-02-07', '13:00:00', '2021-03-01','21:00:00','South Factory','3724 Jackson St.','T');
insert into Track values ('T0256','OLF','E2579','V0012','2021-02-07', '11:00:00', '2021-02-14','10:00:00','OLF Producing Ctr','67 7th Avenue','T');
insert into Track values ('T9980','Macy','E6798','V3579','2020-12-09', '15:00:00', '2020-12-25','10:00:00','1820 5th Avenue','25 Crown Av.','T');
insert into Track values ('T0503','USPS','E2738','V0999','2021-05-08', '12:30:00', null,null,'9820 5th Avenue','Dist. Postal Complex','F');
insert into Track values ('T0327','TASCO','E8986','V0012','2021-03-10', '18:50:00', '2021-03-14','08:00:00','Tasco Warehouse','3344 Jackson St.','T');
insert into Track values ('T0502','Partition','E0001','V0009','2021-05-07', '13:00:00', null,null,'411 Clover Drive','Block20 Gold Plaza','F');
insert into Track values ('T0378','Macy','E8940','V2468','2021-03-30', '19:00:00', '2021-04-01','21:00:00','1222 Queen St.','25 Crown Av.','T');
insert into Track values ('T0423','Oral','E2738','V0778','2021-04-16', '20:00:00', '2021-04-21','17:00:00','467 Clover Drive','Apt.5 374 Mayor St.','T');
insert into Track values ('T0424','OLF','E3578','V0001','2021-04-16', '20:00:00', '2021-04-22','18:00:00','OLF Producing Ctr','67 7th Avenue','T');
```

- transport

```
insert into transport values ('90078','T0101');
insert into transport values ('90247','T0356');
insert into transport values ('90001','T0257');
insert into transport values ('92498','T0256');
insert into transport values ('90092','T9980');
insert into transport values ('90293','T0503');
insert into transport values ('90986','T0327');
insert into transport values ('90423','T0502');
insert into transport values ('90056','T0378');
insert into transport values ('90078','T0423');
insert into transport values ('90238','T0424');
```

ii-b) Data display

```
select * from Producer_company;
```

producer_name	producer_address	producer_telephone
1st seller	3724 Jackson St.	28880001
COMPOLOP	467 Clover Drive	28880111
earth-like	411 Clover Drive	28886666
O.N.	9820 5th Avenue	28879555
OLF	67 7th Avenue	28883301
Seas Fish	1222 Queen St.	28663579
Sky Land	9530 5th Avenue	28883579
StyleBox	1820 5th Avenue	28858273
TASCO	3344 Jackson St.	28009999
Vanky	36 7th Avenue	28888966

```
select * from Retailer_company;
```

retailer_name	retailer_address	retailer_telephone
1st seller	3724 Jackson St.	28880001
Canned	Block5 Gold Plaza.	28663579
Macy	Gold Plaza	28993887
OLF	67 7th Avenue	28883301
Oral	1 Crown Av.	28671536
Partition	Block20 Gold Plaza	28991837
TASCO	3344 Jackson St.	28009999
USPS	Central Gov. Proverty	18001234567
Vanky	36 7th Avenue	28888966
WiCash	1820 5th Avenue	28858273

```
select * from Driver;
```

driver_id	driver_name	gender	driver_age	driver_tel	driver_address	license_type	salary	working_years	driver_free
E0001	XWQ	M	55	68880001	552 B Av.	Probationary	9000.00	1	T
E1839	Roy	M	29	68894923	9304 Jackson St.	Private	13000.00	2	F
E2579	Ivy	M	40	68888901	467 Clover Drive	Commercial	30000.00	17	F
E2738	Marcus	M	25	68980771	1123 Albertson St.	Commercial	22000.00	1	T
E2938	Nick	M	28	66009001	712 Hills St.	Commercial	18900.00	1	F
E3578	Alan	M	30	68875467	721 Hills St.	Commercial	20000.00	3	F
E3931	Philip	M	36	68872937	424 Clover Drive	Private	10300.00	9	T
E6798	Jane	F	47	68887806	90 7th Avenue	Commercial	26700.00	10	F
E8940	Leo	M	25	68829375	45 B Av.	Commercial	20300.00	2	T
E8986	Helen	F	39	68872001	4293 Queen St.	Private	17700.00	12	T

```
select * from Vehicle_model;
```

brand	model	loads	fuel	insurance
FREIGHTLINER	108SD	9.0	69.0	83000.0
FREIGHTLINER	122SD	2.0	51.0	55000.0
FREIGHTLINER	Cascadia	15.0	80.5	100000.0
FREIGHTLINER	eM2	8.0	65.0	70000.0
Kenworth	T680	1.6	48.0	30000.0
Kenworth	T880	1.8	50.0	50000.0
Kenworth	W990	10.0	69.0	90000.0
MACK	Anthem	1.8	49.0	50000.0
MACK	Granite	3.8	55.0	58000.0
MACK	LR	1.6	35.0	30000.0

```
select * from Vehicle;
```

license_num	brand	model	vehicle_free
V0001	Kenworth	T880	T
V0009	MACK	LR	T
V0012	FREIGHTLINER	108SD	T
V0034	MACK	Anthem	F
V0123	FREIGHTLINER	Cascadia	F
V0140	MACK	Granite	F
V0778	FREIGHTLINER	122SD	F
V0999	Kenworth	T680	F
V2468	Kenworth	W990	F
V3579	FREIGHTLINER	eM2	T

```
select * from Orders;
```

order_num	producer_name	good	expense
90001	1st seller	Pipes	25.50
90065	Seas Fish	Cat Food	9.00
90078	COMPOLOP	Batteries	12.00
90092	StyleBox	Clothing	399.00
90238	OLF	Skin Care	78.00
90247	Seas Fish	Canned Fish	33.00
90293	O.N.	Newspapers	1.00
90423	earth-like	Softwares	499.50
90986	TASCO	Optical Instruments	4999.00
92469	1st seller	Cups	10.00
92498	OLF	Skin Care	99.00

```
select * from Track;
```

tracking_num	retailer_name	driver_id	license_num	start_date	start_time	arrive_date	arrive_time	start_address	arrive_address	complete
T0101	1st seller	E2579	V0123	2021-01-01	11:00:00	2021-01-03	09:30:00	South Factory	3724 Jackson St.	T
T0256	OLF	E2579	V0012	2021-02-07	11:00:00	2021-02-14	10:00:00	OLF Producing Ctr	67 7th Avenue	T
T0257	1st seller	E3931	V0140	2021-02-07	13:00:00	2021-03-01	21:00:00	South Factory	3724 Jackson St.	T
T0327	TASCO	E8986	V0012	2021-03-10	18:50:00	2021-03-14	08:00:00	Tasco Warehouse	3344 Jackson St.	T
T0356	Canned	E1839	V0034	2021-03-14	21:00:00	2021-03-20	11:00:00	1222 Queen St.	Block5 Gold Plaza.	T
T0378	Macy	E8940	V2468	2021-03-30	19:00:00	2021-04-01	21:00:00	1222 Queen St.	25 Crown Av.	T
T0423	Oral	E2738	V0778	2021-04-16	20:00:00	2021-04-21	17:00:00	467 Clover Drive	Apt.5 374 Mayor St.	T
T0424	OLF	E3578	V0001	2021-04-16	20:00:00	2021-04-22	18:00:00	OLF Producing Ctr	67 7th Avenue	T
T0502	Partition	E0001	V0009	2021-05-07	13:00:00	NULL	NULL	411 Clover Drive	Block20 Gold Plaza	F
T0503	USPS	E2738	V0999	2021-05-08	12:30:00	NULL	NULL	9820 5th Avenue	Dist. Postal Complex	F
T9980	Macy	E6798	V3579	2020-12-09	15:00:00	2020-12-25	10:00:00	1820 5th Avenue	25 Crown Av.	T

```
select * from transport;
```

	order_num	tracking_num
▶	90078	T0101
	92498	T0256
	90001	T0257
	90986	T0327
	90247	T0356
	90056	T0378
	90078	T0423
	90238	T0424
	90423	T0502
	90293	T0503
	90092	T9980

iii) Ten Reasonable Queries:

1. Find the tracking number and good from deliveries operated by driver Mr. XWQ

```
SELECT Track.tracking_num as 'Waybill#', Orders.good as 'Good'
FROM Driver NATURAL JOIN Track NATURAL JOIN Transport NATURAL JOIN Orders
WHERE Driver.driver_name='XWQ';
```

The result:

	Waybill#	Good
▶	T0502	Softwares

2. List the drivers with his/her license type who earns at least as much as the average income.

```
SELECT driver_id , driver_name , license_type , salary
FROM driver
where salary >= (select avg(salary) from driver) ;
```

The result:

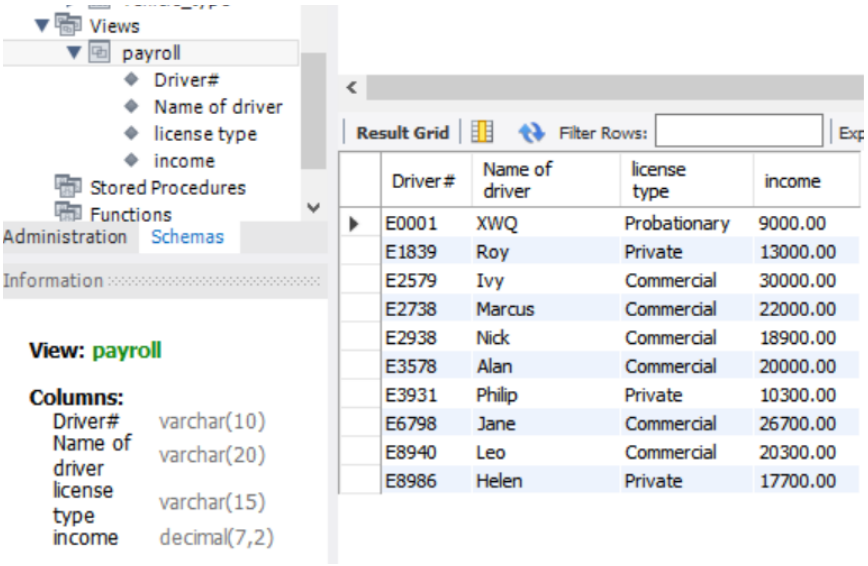
	driver_id	driver_name	license_type	salary
▶	E2579	Ivy	Commercial	30000.00
	E2738	Marcus	Commercial	22000.00
	E2938	Nick	Commercial	18900.00
	E3578	Alan	Commercial	20000.00
	E6798	Jane	Commercial	26700.00
	E8940	Leo	Commercial	20300.00

3.Create a view for drivers' payroll including the ID, name and licensed type then print it.

```
create view payroll as
SELECT driver_id as 'Driver#', driver_name as 'Name of driver',
license_type as 'license type', salary as 'income'
from Driver;

SELECT * FROM transportation.payroll;
```

The result:



4.Find available drivers who hold a commercial license (using in clause).

```
SELECT driver_id, driver_name
FROM Driver
WHERE license_type='Commercial' and driver_id IN
(SELECT driver_id
FROM Driver
WHERE driver_free='T');
```

The result:

	driver_id	driver_name
▶	E2738	Marcus
	E8940	Leo

5.Find the deliveries which were sent to arriving addresses other than the retailers' HQ addresses.

```
SELECT Track.tracking_num as 'Waybill#', Track.arrive_address as 'Destination add.',
Retailer_company.retailer_address as 'Retailer add.'
FROM Track NATURAL JOIN Retailer_company
WHERE Track.arrive_address!=Retailer_company.retailer_address;
```

The result:

	Waybill#	Destination add.	Retailer add.
▶	T0378	25 Crown Av.	Gold Plaza
	T9980	25 Crown Av.	Gold Plaza
	T0423	Apt.5 374 Mayor St.	1 Crown Av.
	T0503	Dist. Postal Complex	Central Gov. Proverty

6.Find the address whose retailer and producer is the same enterprise, make sure there are no duplicate names in the result.

```
SELECT DISTINCT Retailer_company.retailer_name as 'company_name', Retailer_company.retailer_address as 'company_address'
FROM Retailer_company , Producer_company
WHERE Retailer_company.retailer_name=Producer_company.producer_name;
```

The result:

	company_name	company_address
▶	1st seller	3724 Jackson St.
	OLF	67 7th Avenue
	TASCO	3344 Jackson St.
	Vanky	36 7th Avenue

7.Find the driver who has operated at least two deliveries.

```
SELECT Driver.driver_id as 'Driver#', Driver.driver_name as 'Name of driver'
FROM Driver,Track
WHERE Driver.driver_id=Track.driver_id
group by Driver.driver_id
having count(*)>=2;
```

The result:

	Driver#	Name of driver
▶	E2579	Ivy
	E2738	Marcus

8. Find all drivers who have used the same vehicles.

```
SELECT Driver.driver_id, Driver.driver_name
FROM Driver, Track
WHERE Driver.driver_id=Track.driver_id and
Track.license_num=(
SELECT Track.license_num
FROM Track
GROUP BY Track.license_num
HAVING count(*)>=2
);
```

The result:

	driver_id	driver_name
▶	E2579	Ivy
	E8986	Helen

9.Find the car that is not available, which carries no less than 10T goods.

```
SELECT license_num, Vehicle.brand,Vehicle.model
FROM Vehicle natural join vehicle_type
WHERE vehicle_free='F' and vehicle_type.loads>=10;
```

The result:

	license_num	brand	model
▶	V0123	FREIGHTLINER	Cascadia
	V2468	Kenworth	W990

10.Find the model with the most expensive insurance in each brand

```
WITH expense(vehicle_brand,max_insurance) as
(SELECT brand, max(insurance)
FROM vehicle_model
GROUP BY brand)
SELECT brand, model, insurance
FROM vehicle_model, expense
WHERE expense.vehicle_brand=vehicle_model.brand and expense.max_insurance=vehicle_model.insurance;
```

The result:

	brand	model	insurance
▶	FREIGHTLINER	Cascadia	100000.0
	Kenworth	W990	90000.0
	MACK	Granite	58000.0