

Yuwen Sang

COMP 3421: Database Organization & Management - A4

### E/R Schema of the Auto Insurance Company Database:

Customers (**customerID**, cname, age, gender, SSN, dlNum, **coverageID**, **stateName**)

Cars (**VINcode**, brand, color, ctype, **customerID**)

States (**stateName**, climate, pDensity)

Driving Records (**recordID**, DRdate, DRtype)

Coverage (**coverageID**, cAmount, planName, price)

Premium (**premiumID**, paymentPeriod, cAmount, **recordID**, **customerID**)

#### 1. Three Queries

- 1) Find the customerID and the record ID of the customers that have the serious driving accident record and are living in Colorado.

Select C.customerID, R.recordID

-> from Customers C, DrivingRecords R, Premium P

-> where C.customerID = P.customerID and R.recordID = P.recordID and C.stateName = "Colorado" and R.DRtype = "serious";

customerID	recordID
175	1507
239	604
594	510
1545	1213
2051	976
3344	1278
3803	1990
3832	1314
4199	880
4974	1024
5669	1655
6652	1686
7674	1547
8989	507
9419	1536

- 2) Find the planName and the average price of each plan.

Select CV.planName, avg(CV.price)

-> from Coverage CV

-> group by CV.planName;

planName	avg(CV.price)
Premium	550.0000
Silver	880.0000
Gold	1650.0000
Plantinum	2750.0000

- 3) Find the stateName and the average age of the customers of those states that the customers' average age is greater than 60 years old.

```

Select C.stateName, avg(C.age)
-> from Customers C
-> group by C.stateName
-> having avg(C.age) > 60;

```

stateName	avg(C.age)
Kentucky	62.3695
Maine	60.0863
Ohio	60.1515
South Dakota	60.1863
Texas	61.3057
Utah	60.9856

\*The data are not real.

2. Three Data Modifications (More details please run the sample script shown in the appendix)

- 1) A simple insert: Insert a new customer's information in the Customer table:

Code:

```

insert into Customers values (20000, "Bob", 18, "Male", 118899650, NULL, 3,
"Colorado");

```

- 2) A simple update: Change the customer's name to "Alan" whose customerID = 1;

Code:

```

update Customers set cname = "Alan" where customerID = 1;

```

- 3) An update that change several tuples: Change the customers' name from "Alice" to "Alex" if the gender is "Male". (The customer names are all "Alice" originally)

Code:

```

update Customers set cname = "Alex" where gender = "Male";

```

## APPENDIX: Sample Code

# Notice: This is a sample file which only imported several tuples for each table in the database

# to demonstrate the data modifications work (The original database has 10,000 tuples)

show databases;

drop database if exists carInsurance\_sample;

create database carInsurance\_sample;

use carInsurance\_sample;

# create 6 tables

#1. Coverage

drop table if exists Coverage;

create table Coverage(

coverageID int NOT NULL,

cAmount varchar(10) NOT NULL,

planName varchar(15) NOT NULL,

price int NOT NULL,

primary key (coverageID));

describe Coverage;

#2. States (here we use states instead)

drop table if exists States;

create table States(

stateName varchar(20) NOT NULL,

climate varchar(15) NOT NULL,

pDensity varchar(10) NOT NULL,

primary key (stateName));

describe States;

#3. DrivingRecords

drop table if exists DrivingRecords;

create table DrivingRecords(

recordID int NOT NULL,

DRdate varchar(15),

DRtype varchar(20) NOT NULL,

```
primary key (recordID));  
describe DrivingRecords;
```

#### #4. Customers

```
drop table if exists Customers;  
create table Customers(  
    customerID int NOT NULL,  
    cname varchar(30),  
    age int,  
    gender varchar(10),  
    ssN int,  
    dlNum int,  
    coverageID int NOT NULL,  
    stateName varchar(20) NOT NULL,  
    primary key (customerID),  
    foreign key (coverageID) references Coverage(coverageID),  
    foreign key (stateName) references States(stateName));  
describe Customers;
```

#### #5. Cars

```
drop table if exists Cars;  
create table Cars(  
    VINcode varchar(20) NOT NULL,  
    brand varchar(15),  
    color varchar(15),  
    ctype varchar(10),  
    customerID int NOT NULL,  
    primary key (VINcode),  
    foreign key (customerID) references Customers(customerID));  
describe Cars;
```

#### #6. Premium

```
drop table if exists Premium;  
create table Premium(  
    -- table definition continues here
```

```
        premiumID int NOT NULL,
    paymentPeriod varchar(15),
    cAmount varchar(10) NOT NULL,
    recordID int,
    customerID int NOT NULL,
    primary key (premiumID),
    foreign key (recordID) references DrivingRecords(recordID),
    foreign key (customerID) references Customers(customerID));
describe Premium;
```

#Insert Tuples:

```
insert into Coverage values(1,"high","Premium",500);
insert into Coverage values(2,"medium","Premium",550);
insert into Coverage values(3,"low","Premium",600);
insert into Coverage values(4,"high","Silver",800);
insert into Coverage values(5,"medium","Silver",880);
insert into Coverage values(6,"low","Silver",960);
insert into Coverage values(7,"high","Gold",1500);
insert into Coverage values(8,"medium","Gold",1650);
insert into Coverage values(9,"low","Gold",1800);
insert into Coverage values(10,"high","Plantinum",2500);
insert into Coverage values(11,"medium","Plantinum",2750);
insert into Coverage values(12,"low","Plantinum",3000);

insert into States values("Wyoming","normal","low");
insert into States values("Alabama","bad","low");
insert into States values("Alaska","bad","low");
insert into States values("Arizona","bad","medium");
insert into States values("Arkansas","normal","medium");
insert into States values("California","normal","high");
insert into States values("Colorado","bad","medium");
insert into States values("Connecticut","bad","high");
insert into States values("Delaware","normal","high");
insert into States values("Florida","bad","medium");
```

```
insert into States values("Georgia","normal","high");
insert into States values("Hawaii","normal","low");
insert into States values("Idaho","bad","medium");
insert into States values("Illinois","normal","high");
insert into States values("Indiana","normal","medium");
insert into States values("Iowa","normal","medium");
insert into States values("Kansas","normal","medium");
insert into States values("Kentucky","bad","low");
insert into States values("Louisiana","bad","high");
insert into States values("Maine","bad","high");
insert into States values("Maryland","bad","low");
insert into States values("Massachusetts","normal","high");
insert into States values("Michigan","bad","medium");
insert into States values("Minnesota","bad","low");
insert into States values("Mississippi","normal","low");
insert into States values("Missouri","normal","low");
insert into States values("Montana","normal","low");
insert into States values("Nebraska","normal","low");
insert into States values("Nevada","bad","low");
insert into States values("NewHampshire","normal","high");
insert into States values("NewJersey","bad","low");
insert into States values("NewMexico","bad","high");
insert into States values("NewYork","bad","high");
insert into States values("NorthCarolina","bad","high");
insert into States values("NorthDakota","normal","medium");
insert into States values("Ohio","normal","high");
insert into States values("Oklahoma","normal","low");
insert into States values("Oregon","normal","low");
insert into States values("Pennsylvania","bad","medium");
insert into States values("RhodeIsland","bad","low");
insert into States values("SouthCarolina","bad","high");
insert into States values("South Dakota","normal","medium");
insert into States values("Tennessee","bad","low");
insert into States values("Texas","bad","low");
```

```
insert into States values("Utah","normal","medium");
insert into States values("Vermont","normal","medium");
insert into States values("Virginia","bad","high");
insert into States values("Washington","bad","high");
insert into States values("WestVirginia","normal","medium");
```

```
insert into DrivingRecords values(1,"2020-6-11","slight");
insert into DrivingRecords values(2,"2020-11-4","medium");
insert into DrivingRecords values(3,"2020-10-3","serious");
```

```
insert into Customers values(1,"Alice",55,"Female",946286476,784077896,10,"Idaho");
insert into Customers values(2,"Alice",23,"Female",396591248,629559425,8,"Virginia");
insert into Customers values(3,"Alice",24,"Female",166716594,413652244,6,"Maine");
insert into Customers values(4,"Alice",29,"Male",550260202,986026652,3,"California");
insert into Customers values(5,"Alice",31,"Female",937426313,226591751,7,"Alaska");
insert into Customers values(6,"Alice",18,"Male",339933393,365262088,9,"Indiana");
insert into Customers values(7,"Alice",65,"Male",550367865,732412360,8,"Arkansas");
insert into Customers values(8,"Alice",88,"Female",694873649,142443833,4,"California");
insert into Customers values(9,"Alice",42,"Female",610401323,801015372,11,"Kentucky");
insert into Customers values(10,"Alice",59,"Male",689925184,208285721,3,"Mississippi");
```

```
insert into Cars values("7QKI1CLUY2PT4BKXBS68","Chevrolet","blue","Truck",1);
insert into Cars values("MK4TUGNAJPJ9TCZ6UB24","Jeep","red","Truck",2);
insert into Cars values("ICX6GTMYPQ5LXDX1KOCA4","Honda","others","Sport",3);
insert into Cars values("PGNWIVJ8KEIR9I1OZV45","KIA","black","Truck",4);
insert into Cars values("55R9IAD6BEKZA2J7JQGB","BMW","black","Truck",5);
insert into Cars values("HAO0QZCJ28ONY02PDJUE","GMC","white","Truck",6);
insert into Cars values("I8PTAQ2HF87M3JO6MC2J","Honda","others","SUV",7);
insert into Cars values("BPVRW0JKVAB2B6C3W23J","Jeep","black","SUV",8);
insert into Cars values("S2SJQ2Y1NG5J6FG888XY","Audi","silver","SUV",9);
insert into Cars values("5AFMWCK700Y8K7RI2WY8","Cadillac","others","Sport",10);
```

```
insert into Premium values(532988752,"month","high",1,3);
insert into Premium values(906869042,"month","high",2,2);
```

```
insert into Premium values(626403767,"month","medium",3,6);
insert into Premium values(703983615,"week","medium",NULL,1);
insert into Premium values(688578699,"year","low",NULL,4);
insert into Premium values(130168172,"year","medium",NULL,5);
insert into Premium values(644547714,"month","high",NULL,7);
insert into Premium values(937865093,"month","high",NULL,8);
insert into Premium values(523672051,"week","low",NULL,9);
insert into Premium values(402720540,"month","low",NULL,10);
```

# Describe

```
Select * from Customers;
```

# Three Data Modifications:

# 1) A simple insert: Insert a new customer's information in the Customer table:

```
insert into Customers values (20000, "Bob", 18, "Male", 118899650, NULL, 3, "Colorado");
select * from Customers;
```

#2) A simple update: Change the customer's name to "Alan" whose customerID = 1;

```
update Customers set cname = "Alan" where customerID = 1;
select * from Customers;
```

#3) An update that change several tuples: Change the customers' name from "Alice" to "Alex" if the gender is "Male".  
(The customer names are all "Alice" originally)

```
update Customers set cname = "Alex" where gender = "Male";
select * from Customers;
```