Συστήματα Διαχείρισης και Ανάλυσης Δεδομένων

2ο Project 2023

Βεάζογλου Γεώργιος 3190347

Ζήτημα Πρώτο:

Δημιουργούμε τον πίνακα CardsTransactions και φορτώνουμε τα δεδομένα:

```
create table CardsTransactions(
	pid int,
	pname varchar(50),
	age int,
	gender char(1),
	cardno char(16),
	card_brand varchar(30),
	card_type varchar(20),
	tdate datetime,
	amount decimal(6,2),
	ttc int,
	trans_type varchar(30),
	mcc int,
	merchant_city varchar(50)
)

BULK INSERT CardsTransactions
FROM 'C:\data\CardsTransactions.txt'
WITH (FIRSTROW =2, FIELDTERMINATOR='|', ROWTERMINATOR = '\n');
```

Δημιουργούμε το σχήμα της αποθήκης δεδομένων με fact table τον πίνακα transactions και τέσσερις πίνακες διαστάσεων owners, cards, cities, tdate.

```
create table owners(
	pid int primary key,
	pname varchar(50),
	age int,
	gender char(1)
)


create table cards(
	cardno char(16) primary key,
	card_brand varchar(30),
	card_type varchar(20)
)


create table cities(
	mmc int primary key,
	merchant_city varchar(50)
)
```

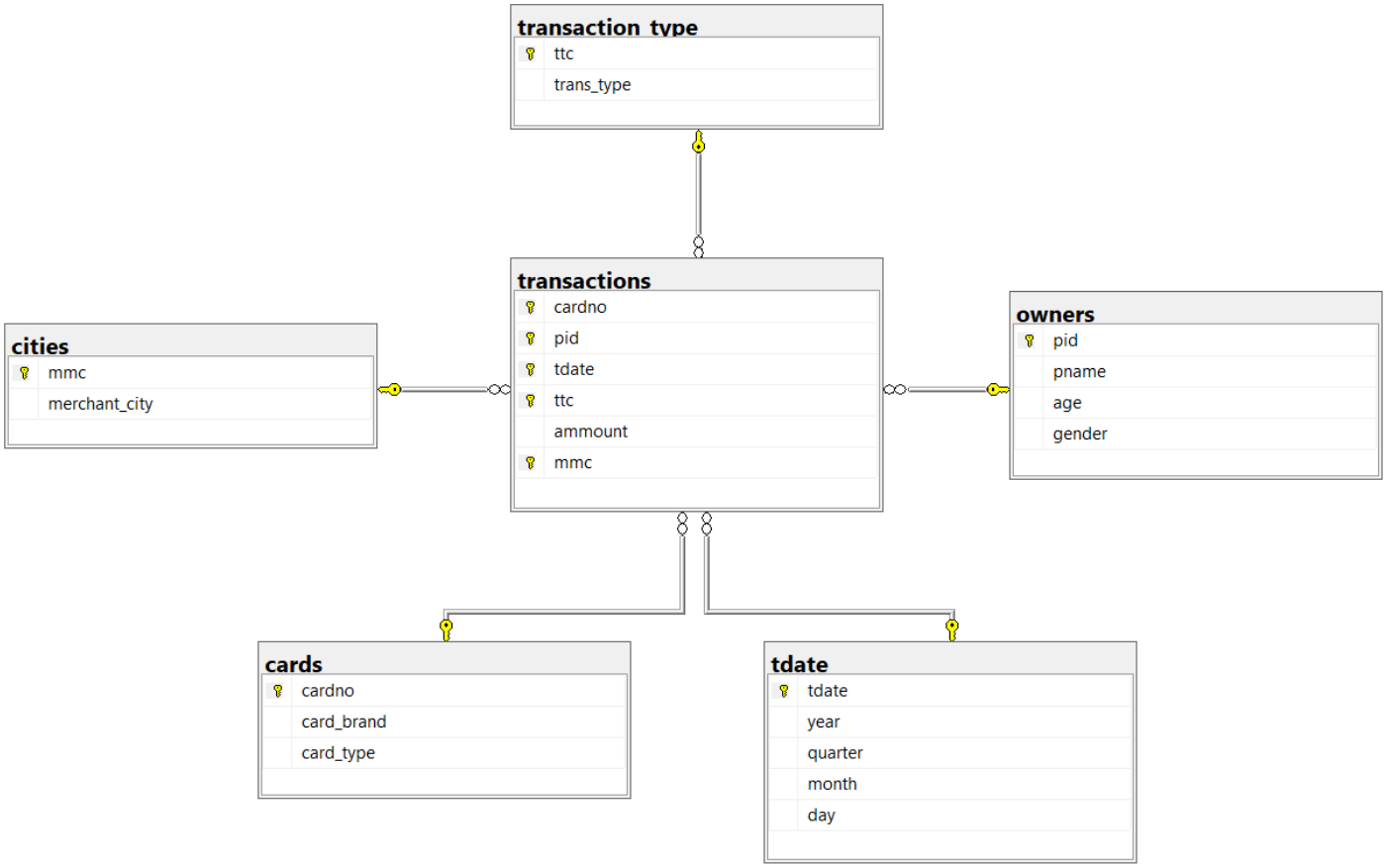
```
create table tdate(
	tdate datetime primary key,
	year int,
	quarter int,
	month int,
	day int
)

create table transaction_type(
	ttc int primary key,
	trans_type varchar(30)
)

create table transactions(
	cardno char(16),
	pid int,
	tdate datetime,
	ttc int,
	mmc int,
	ammount decimal(6,2),

	foreign key (cardno) references cards(cardno),
	foreign key (mmc) references cities(mmc),
	foreign key (pid) references owners(pid),
	foreign key (tdate) references tdate(tdate),
	foreign key (ttc) references transaction_type(ttc),
	primary key (cardno, pid, tdate, ttc, mmc)
)
```

Τροφοδοτούμε με δεδομένα τους πίνακες της αποθήκης.

```
insert into owners
select distinct pid, pname, age, gender
from CardsTransactions



insert into cards
select distinct cardno, card_brand, card_type
from CardsTransactions



insert into cities
select distinct mmc, merchant
from CardsTransactions



insert into tdate
select distinct tdate, datepart(year, tdate), datepart(quarter,tdate),
datepart(month, tdate), datepart(day, tdate)
from CardsTransactions



insert into transactions
select cardno, pid, tdate, ttc, mmc, ammount
from CardsTransactions
```

```
insert into transaction_type
select distinct ttc, trans_type
from CardsTransactions
```

Διάγραμμα αναπαράστασης του σχήματος της αποθήκης.



Ζήτημα Δεύτερο:

1.
```
select merchant_city, sum(ammount) as amount
from cities, transactions
where cities.mmc = transactions.mmc
group by merchant_city
order by merchant_city asc
```

2.
```
select year, gender, sum(ammount) as amount
from transactions
join owners on transactions.pid = owners.pid
join tdate on transactions.tdate = tdate.tdate
group by year, gender
order by year
```

3.

```
select card_brand, card_type, count(*) as transactions,  sum(ammount) as amount
from transactions
join cards on transactions.cardno = cards.cardno
group by card_brand, card_type
```

4.

```
select trans_type, quarter, sum(ammount) as amount
from transactions
join tdate on transactions.tdate = tdate.tdate
join transaction_type on transactions.ttc = transaction_type.ttc
where tdate.year = 2019
group by trans_type, quarter
```

5.

```
select year, gender, age, sum(ammount) as amount
from transactions
join tdate on transactions.tdate = tdate.tdate
join owners on transactions.pid = owners.pid
where ttc = 1
group by rollup (year, gender, age)
```

Ζήτημα Τρίτο:

1.

```
select year, card_brand, gender, count(*) as count
from tdate, cards, owners, transactions
where transactions.tdate = tdate.tdate and
       transactions.cardno = cards. cardno and
       transactions.pid = owners.pid
group by cube (year, card_brand, gender)
```

2.

Δημιουργία όψης:

```
view_CTDW with schemabinding as
select [d].year, [c].card_brand, [o].gender, count_big(*) as transactions
from dbo.transactions [t], dbo.tdate [d], dbo.owners [o], dbo.cards [c]
where [t].tdate = [d].tdate and
       [t].pid = [o].pid and
       [t].cardno = [c].cardno
group by [d].year, [c].card_brand, [o].gender
```

Δημιουργία index:

```
create unique clustered index idx_view on view_CTDW(year, card_brand, gender)
```

Group by βάσει έτους, επωνυμίας και φύλου:

```
select year, card_brand, gender, sum(transactions) as transactions
from view_CTDW
group by year, card_brand, gender
```

Group by βάσει έτους και φύλου:

```
select year, gender, sum(transactions) as transactions
from view_CTDW
group by year, gender
```

Group by βάσει έτους και επωνυμίας κάρτας:

```
select year, card_brand, sum(transactions) as transactions
from view_CTDW
group by year, card_brand
```

Group by βάσει επωνυμίας και φύλου:

```
select card_brand, gender, sum(transactions) as transactions
from view_CTDW
group by card_brand, gender
```

Group by βάσει έτους:

```
select year, sum(transactions) as transactions
from view_CTDW
group by year
```

Group by βάσει επωνυμίας:

```
select card_brand, sum(transactions) as transactions
from view_CTDW
group by card_brand
```

Group by βάσει φύλου:

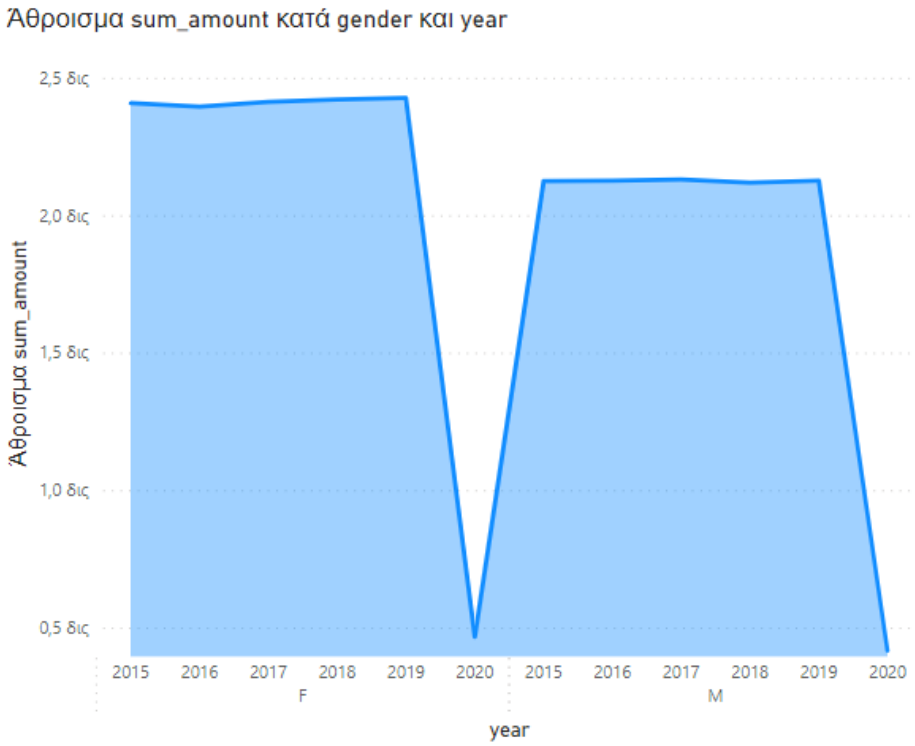
```
select gender, sum(transactions) as transactions
from view_CTDW
group by gender
```

Group by none:

```
select sum(transactions) as transactions
from view_CTDW
```

Ζήτημα Τέταρτο:

1.



2.