**Patterns**

1. **For any bill, Bills.time > Bar.opening && Bills.time < Bar.closing**

select distinct Bills.id, Bills.time, Bills.date, Bills.drinker, Bills.bar

from Bills, Bars

Where (Bars.name = Bills.bar) and ((Bills.time > Bars.open) OR (Bills.time < Bars.close) )

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Select not exists(

Select \*

From Bills, Bars

Where Bars.name = Bills.bar

And Bills.time < Bars.open

And Bills.time > Bars.close)

As results;

**2.) For any drinker in Frequents, Drinker.state == Bar.state**

select distinct f.drinker, f.bar

from Drinkers d, Bars b, Frequents f

where d.name = f.drinker and b.name = f.bar and b.state = d.state

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Select not exists(

Select \*

From Drinkers d, Bars b, Frequents f

Where d.name = f.drinker

And b.name = f.bar

And b.state <> d.state)

As result;

**3.) For different beers b1 and b2, Sells.price of b1 <= Sells.price of b2 for all bars,**

**or Sells.price of b1 >= Sells.price of b2 for all bars**

select not exists (

select \*

from (select \* from Sells) s1,

(select \* from Sells) s2,

(select \* from Sells) s3,

(select \* from Sells) s4

where s1.item = s3.item

and s2.item = s4.item

and s1.bar = s2.bar

and s3.bar = s4.bar

and s1.item <> s2.item

and s3.item <> s4.item

and s1.item IN (

select item

from Beers

)

and s2.item IN(

select item

from Beers

)

and s1.price > s2.price

and s3.price < s4.price

) as result

**4.) For beer b1, total sold of b1 <= inventory.count (doesn’t include food items as there is no inventory for them)**

select t1.\*

from Transactions t1

where t1.item in (

select t.item

from Transactions t, Bills b, Bars ba

where b.id = t.bill and b.bar = ba.name

group by b.bar, t.item

having sum(t.count) < (select i.count from Inventory i where i.bar = b.bar and i.item = t.item))

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Select not exists(

Select \*

From Transactions t1

Where t1.item in(

Select t.item

From Transactions t, Bills b, Bars ba

Where b.id = t.bill and b.bar = ba.name

Group by b.bar, t.item

Having sum(t.count) > (select i.count from Inventory i where i.bar = b.bar and i.item = t.item))

) as results

**5.) For any 2 shifts, shift1.date != shift2.date**

Select not exists(

select distinct \*

from Shifts s1, Shifts s2

where s1.date = s2.date

and s1.bartender = s2.bartender

and (s1.start != s2.start

or s1.end != s2.end))

As results

**6.) For any item in inventory where inventory.bar == sells.bar, item must be in sells**

select distinct s.bar, s.item, s.price

from Sells s

where s.item in (select i.item from Inventory i where i.bar = s.bar)

or s.item in (select \* from Food)

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Select not exists(

select \*

from Sells s

where s.item not in (select i.item from Inventory i where i.bar = s.bar)

and s.item in (select item from Beers)

) as result;

**7.) Remaining queries are in the code under the server folder**