CS425 - Database Organization

Homework Assignment 2

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Part 2.1 SQL DDL (Total: 14 Points)

Question 2.1.1 (7 Points)

Write an SQL statement that creates a new table *newrental* that stores the *owner* and the owner's *buildingNo* and *aptNo* assigned to a *tenant*. Furthermore, we also want to store *neighbourhoodRates* in dollars for every new rental contract. The combination of owner, building no.,apt no. and tenant uniquely identifies an new rental contract. For each contract make sure that the neighbourhoodRate for this contract is bigger than 1500 and smaller than 3000 dollar.

```
CREATE TABLE newrental(
owner varchar(256),
buildingNo varchar(256),
aptNo varchar(256),
tenant varchar(256),
neighbourhoodRates numeric(8,2) not null check
(neighbourhoodRates between 1501 and 2999),
PRIMARY KEY (owner,buildingNo,aptNo,tenant),
FOREIGN KEY (owner) REFERENCES owner(ownerName),
FOREIGN KEY (tenant) REFERENCES tenant(tenantName)
);
```

Question 2.1.2 (7 Points)

Write an SQL statement that creates a table *dealsFor* that records which realtor deals buildings of which owner. For each such relationship between owners and realtors we record a commission for the realtor. A realtor may deal/sell buildings for several owners (and obviously a owner can employ multiple realtors).

```
CREATE TABLE dealsFor(
realtor varchar(256),
buildingNo number(3),
owner varchar(256),
commission numeric(8,2),
PRIMARY KEY (realtor,owner),
FOREIGN KEY (owner) REFERENCES owner(ownerName)
);
```

Part 2.2 SQL Queries (Total: 56 + 10 BONUS Points)

Question 2.2.1 (5 Points)

Write an SQL query that returns the owner names and building no. of the buildings they own for all owners whose birthplace is Tampa or Orlando and who owns at least one a building in "The Hamilton" neighbourhood.

```
SELECT b.OWNER, b.BUILDINGNO
FROM owner o JOIN buildingInfo b on o.ownerName = b.owner
WHERE (birthPlace = 'Tampa' or birthPlace = 'Orlando') and
        (b.NEIGHBOURHOOD = 'The Hamilton') ;
```

Question 2.2.2 (5 Points)

Write an SQL query that returns bulding no. and tenant name for tentants that live in an apartment with apt. no between 8 and 11.

```
SELECT buildingNo,tenantName
FROM tenant
WHERE aptNo >= 8 and aptNo <= 11 ;
```

Question 2.2.3 (7 Points)

Write an SQL query that counts the number of pairs of owners and tentants where all of the following conditions apply: 1) each tenant should only be paired with the owner of the building they live in, 2) the owner and tenant have the same birthplace, and 3) the tenant has been living his/her current residence for more than 4 years.

```
SELECT count(concat(b.OWNER,t.TENANTNAME)) as cnt
FROM (buildingInfo b JOIN owner o on b.owner=o.ownerName) join
        tenant t on b.buildingNo=t.buildingNo
WHERE (b.buildingNo = t.buildingNo and
        (t.aptNo >= b.fromAptNo and t.aptNo <= toAptNo)) and
        (t.birthplace = o.birthplace) and
        ((select to_char(sysdate, 'YYYY') from dual) - t.livingSince > 4) ;
```

Question 2.2.4 (7 Points)

Write an SQL query that returns all birthplaces for which the average age of owners for that place is above 40.

```
SELECT birthPlace
FROM  owner
group by birthplace
having avg(age) > 40 ;
```

Question 2.2.5 (7 Points)

Write an SQL query that returns the owner-tenant pairs who are dealt by same realtor. For example, relator Samuel (realtor table) deals in neighbourhood *The Hamilton*. Cherry owns a building in same neighbourhood (*The Hamilton*) and also tenant *Victor* living in buildingNo 377 of same neighbourhood *The Hamilton*. Thus, the pair Cherry and Victor would be in the result.

```
SELECT  b.owner || '-' || t.tenantName as Owner_Tenant
FROM buildingInfo b join tenant t on b.BUILDINGNO = t.BUILDINGNO
WHERE t.aptNo >= fromAptNo and t.aptNo <= toAptNo ;
```

Question 2.2.6 (8 Points)

Write an SQL query that returns potential tenants (names) and realtors (names) with the building no and aptNo if the contract of the tenant currently occupying the apartment (if any) has ended. To determine whether a contract has expired, assume that the realtor mentioned in the potential contract is the same as the realtor that dealt with the current occupant of the apartment. Thus, you can use the value of attribute yrsOfcontract for this realtor for the neighborhood a building is located in together with livingSince to determine whether the contract of the current owner has expired. Hint: you can use SQL function **CURRENT_DATE** to get the current date and from that the year or alternatively assume that the current year is 2016.

```
SELECT distinct p.tenant,p.buildingNo,p.realtor,p.aptNo
FROM (( potentialcontract p JOIN tenant t on p.BUILDINGNO = t.BUILDINGNO )
          JOIN realtor r on p.REALTOR = r.RNAME )
          JOIN buildingInfo b on b.BUILDINGNO = t.BUILDINGNO
WHERE ( p.APTNO <> t.APTNO ) or ( p.APTNO = t.APTNO and
           r.NEIGHBOURHOOD =  b.NEIGHBOURHOOD and
           (select to_char(sysdate, 'YYYY') from dual) - t.livingSince > r.yrsOfcontract ) ;
```

Question 2.2.7 (9 Points)

Write an SQL query that returns building numbers and apartment number(s) for the apartments which are available for rent, i.e., which are stored in the buildingInfo table, but are currently not occupied and in tenant table, whose contract has expired.

```
SELECT buildingno, listagg(aptnum,',') within group (order by aptnum) as aptnumber
FROM  (SELECT distinct B1.BUILDINGNO, level as APTNUM
          FROM (select level from dual connect by level <= 20 ) A1,
          (select b.FROMAPTNO, b.TOAPTNO ,t.APTNO, b.BUILDINGNO
          from buildingInfo b LEFT OUTER JOIN tenant t
          on b.BUILDINGNO = t.BUILDINGNO) B1
          WHERE  level >= B1.FROMAPTNO  and level <> B1.APTNO
          connect by level <= B1.TOAPTNO
          order by B1.BUILDINGNO,level)
group by buildingno ;
```

Question 2.2.8 (8 Points)

Write an SQL query which returns the name(s) of the tenants who are living in the neighbourhood with the highest neighbourhood rate.

```
SELECT  t.tenantName
FROM    (BUILDINGINFO b join REALTOR r on
           b.NEIGHBOURHOOD = r.NEIGHBOURHOOD)
           join TENANT t on b.BUILDINGNO = t.BUILDINGNO
WHERE r.NEIGHBOURHOODRATES = (select max(r.neighbourhoodrates)
           from realtor r) ;
```

Question 2.2.9 BONUS (5 Points)

Suppose the apartments in the potential contract table have all become unavailable, write an SQL query that displays for every potential tenant (person mentioned in potentialcontract) all available apartments by the same owner as apartment the tenant was interested in. If no apartments of the owner are available, return all available apartments in the same neighbourhood.

```
SELECT tenant , buildingno, listagg(aptnum,',') within group
           (order by aptnum) as aptnumber
FROM   (SELECT distinct b1.TENANT, B1.BUILDINGNO, level as APTNUM
            FROM (select level from dual connect by level <= 20 ) A1,
           (select b.FROMAPTNO, b.TOAPTNO, p.APTNO, b.BUILDINGNO, p.TENANT
            from buildingInfo b , POTENTIALCONTRACT p
            where b.BUILDINGNO = p.BUILDINGNO) B1
            WHERE  level >= B1.FROMAPTNO  and level <> APTNO
           connect by level <= B1.TOAPTNO
           order by  b1.TENANT, B1.BUILDINGNO, level)
group by tenant, buildingno ;
```

Question 2.2.10 BONUS (5 Points)

Write an SQL query that returns the average number of buildings available to rent by owners for every birth place.

```
SELECT avg(numO) as avgNum , birthplace
FROM ( select count(*) as numO, o.ownerName, o.birthPlace
        from owner o join buildingInfo b on o.ownerName = b.owner
        group by o.OWNERNAME,o.BIRTHPLACE )
group by birthplace;
```

Part 2.3 SQL Updates (Total: 30 + 5 BONUS Points)

Question 2.3.1 (7 Points)

Write an SQL operation that deletes all buildings that were owned for more than 18 years.

```
DELETE from buildingInfo
WHERE owningSince < (select to_char(sysdate, 'YYYY') from dual) - 18 ;
```

Question 2.3.2 (8 Points)

Decrease the rate of all neighborhoods dealt by realtor Samuel and Adam by 2,000.

```
UPDATE realtor set neighbourhoodRates = neighbourhoodRates - 2000
WHERE (rName = 'Samuel' or rName = 'Adam') ;
```

Question 2.3.3 (6 Points)

Insert a new neighbourhood *Capendon* handeled by realtor *Monit*. Buildings in this neighbourhood are available for contracts of *4* years and at *$2700* rate.

```
INSERT into realtor values ('Monit', 'Capendon', 4, 2700) ;
```

Question 2.3.4 (9 Points)

Update livingSince to 2009 in the tenant table for tentants living in building with building number 377 if their current livingSince year is 2011.

```
UPDATE tenant set livingSince = 2009
WHERE ( buildingNo = 377 and livingSince = 2011 ) ;
```

Question 2.3.5 BONUS (5 Points)

Change the contract years for *The Hamilton* and *Prestwick Chase* neighbourhood. Contract for *The Hamilton* neighbourhood should be set to the ceiling of the average contract length for this neighbourhood plus 2 and Contractfor *Prestwick Chase* neighbourhood should be set to the maximum contract length for this neighbourhood minus 3.

```
UPDATE realtor r
SET  yrsofcontract =  CASE WHEN NEIGHBOURHOOD = 'The Hamilton'
                    THEN ( select CEIL(avg(yrsofcontract))
                        from realtor a
                        where a.YRSOFCONTRACT = r.YRSOFCONTRACT
                        group by neighbourhood) + 2
                    WHEN NEIGHBOURHOOD = 'Prestwick Chase'
                    THEN ( select max(yrsofcontract)
                        from realtor a
                        where a.YRSOFCONTRACT = r.YRSOFCONTRACT
                        group by neighbourhood) - 3
                END
WHERE   NEIGHBOURHOOD IN ('Prestwick Chase', 'The Hamilton');
```

-------END-----