SQL - DML

Review with an example

SELECT Statement

SELECT [DISTINCT]

   {* | [columnExpression [AS newName]] [,...] }

FROM   TableName [alias] [, ...]

[WHERE   condition]

[GROUP BY   columnList] [HAVING   condition]

[ORDER BY   columnList]

SELECT Statement

FROM   Specifies table(s) to be used.

WHERE   Filters rows.

GROUP BY   Forms groups of rows with same column value.

HAVING   Filters groups subject to some condition.

SELECT   Specifies which columns are to appear in output.

ORDER BY   Specifies the order of the output.

SELECT Statement

- Order of the clauses cannot be changed.

- Only SELECT and FROM are mandatory.

Problem

Consider the following database designed to maintain information for a national football league.

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Here most attributes have obvious meanings. The others are explained in the following:

Pbdate: player's birthdate
Coo: Country of origin
Hteamno: Home team's number
Vteamno: Visiting team's number
Rbdate: Referee's birthdate

Write the SQL statements for the following queries.

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the counts of players by the country of origin, but only for foreign countries (i.e. country not 'Turkey'). Print them out as shown below:

COUNTRY	PCOUNT
France	4
…	…

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Pno	Teamno	Lname	Fname	pbdate	coo
300	1	Doe	John	1980	TR
301	3	Hammer	Mike	1965	FR
302	4	Who	Alice	1990	TR
303	2	Trump	Real	1970	DE
304	4	Jones	Bridgitte	1975	FR

301	3	Hammer	Mike	1965	FR
304	4	Jones	Bridgitte	1975	FR
303	2	Trump	Real	1970	DE

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Pno	Teamno	Lname	Fname	pbdate	coo
300	1	Doe	John	1980	TR
301	3	Hammer	Mike	1965	FR
302	4	Who	Alice	1990	TR
303	2	Trump	Real	1970	DE
304	4	Jones	Bridgitte	1975	FR

SELECT P.coo, Count(*) AS PCount
FROM Players P
WHERE P.coo<>"tr"
GROUP BY P.coo

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Pno	Teamno	Lname	Fname	pbdate	coo
300	1	Doe	John	1980	TR
301	3	Hammer	Mike	1965	FR
302	4	Who	Alice	1990	TR
303	2	Trump	Real	1970	DE
304	4	Jones	Bridgitte	1975	FR

300	1	Doe	John	1980	TR
302	4	Who	Alice	1990	TR
301	3	Hammer	Mike	1965	FR
304	4	Jones	Bridgitte	1975	FR
303	2	Trump	Real	1970	DE

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Pno	Teamno	Lname	Fname	pbdate	coo
300	1	Doe	John	1980	TR
301	3	Hammer	Mike	1965	FR
302	4	Who	Alice	1990	TR
303	2	Trump	Real	1970	DE
304	4	Jones	Bridgitte	1975	FR

SELECT P.coo, Count(*) AS PCount
FROM Players P
WHERE P.coo<>"tr"
GROUP BY P.coo

SELECT P.coo, Count(*) AS PCount
FROM Players P
GROUP BY P.coo
HAVING P.coo<>"tr"

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the the first/last names of all the referees who are younger than a player in the league.

TEAMS (<u>Teamno</u>, Teamname, Town)

PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)

MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)

REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the ref nos of all the referees who are younger than a player in the league.

Refno	Rbdate
100	1970
101	1975

Pno	Teamno	Pbdate
300	1	1980
301	3	1965
302	4	1990
303	2	1970
304	4	1975

Refno
100
101
101

TEAMS (Teamno, Teamname, Town)
PLAYERS (Pno, Teamno, Lname, Fname, Pbdate, Coo)
MATCHES (Matchno, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (Refno, Lname, Fname, Rbdate)

- List the ref nos of all the referees who are younger than **a player** in the league.

  SELECT R.refno
  FROM referees R, players P
  WHERE R.rbdate > P.pbdate

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the ref no's of all the referees who are younger than a player in the league together with the number of such of players.

  SELECT R.refno, COUNT(*)
  FROM referees R, players P
  WHERE R.rbdate > P.pbdate
  GROUP BY R.refno

TEAMS (Teamno, Teamname, Town)
PLAYERS (Pno, Teamno, Lname, Fname, Pbdate, Coo)
MATCHES (Matchno, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (Refno, Lname, Fname, Rbdate)

- List the match numbers and referee fnames for those matches where the referee was younger than **every player** from the visitor team.

Pno	Teamno	pbdate
300	1	1980
301	3	1965
302	4	1990
303	2	1970
304	4	1975

Matchno	Hteamno	Vteamno	Refno
2000	1	2	100
2003	3	4	101

Refno	Rbdate
100	1970
101	1995

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the match numbers and referee fnames for those matches where the referee was younger than every player from the visitor team.

SELECT M.matchno, R.fname
FROM matches M, referees R
WHERE R.refno = M.refno AND
      R.rbdate **> ALL**
            (**SELECT** p.pbdate
            FROM players P
            WHERE p.teamno = M.VTeamno);

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the the first/last names of all the referees who refereed a game where at least one participating player had the same birthdate as the referee.

TEAMS (<u>Teamno</u>, Teamname, Town)

PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)

MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)

REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

Pno	Teamno	pbdate	Matchno	Hteamno	Vteamno	Refno	Rbdate
300	1	1980	2000	1	2	100	1970
301	3	1965	2003	3	4	101	1975
303	2	**1970**	2000	1	2	100	**1970**
302	4	1990	2003	3	4	101	1975
304	4	**1975**	2003	3	4	101	**1975**

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the first/last names of all the referees who refereed a game where at least one participating player had the same birthdate as the referee.

SELECT R.fname, R.lname
FROM referees R, matches M, players P
WHERE (R.refno=M.refno **AND** P.teamno=M.**HTeamno AND** R.rbdate=P.pbdate)
        OR
        (R.refno=M.refno **AND** P.teamno=M.**VTeamno AND** R.rbdate=P.pbdate)

You can also answer the same query using UNION!

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the first/last names of all the referees who refereed a game where at least one participating player had the same birthdate as the referee.

SELECT R.fname, R.lname
FROM referees R, matches M, players P
WHERE (R.refno=M.refno **AND** P.teamno=M.**HTeamno AND** R.rbdate=P.pbdate)
UNION
SELECT R.fname, R.lname
FROM referees R, matches M, players P
WHERE (R.refno=M.refno **AND** P.teamno=M.**VTeamno AND** R.rbdate=P.pbdate)

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the first/last names of all the referees who refereed a game where at least one participating player had the same birthdate as the referee.

SELECT R.fname, R.lname
FROM matches M, players P
WHERE R.refno=M.refno **AND** R.rbdate **IN**

(**SELECT** P.pbdate
FROM players P
WHERE P.teamno=**M**.HTeamno **OR**
P.teamno=**M**.VTeamno)

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the names of all teams and the total number of matches won by each (at home and away):

TEAMNAME	NUMWINS
Galatasaray	12
Ankara	8
...	

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the names of all teams and the total number of matches won by each (at home and away):

Teamno	Teamname		Matchno	Hteamno	Vteamno	Hgoals	Vgoals	Refno
1	GS		2000	1	2	3	2	100
2	FB		2001	1	3	4	3	100
3	BJK		2002	2	3	4	5	100
4	TRA		2003	3	4	2	2	101
			2004	3	4	3	1	101
			2005	4	3	2	6	101

TEAMS (<u>Teamno</u>, Teamname, Town)
PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)
MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)
REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the names of all teams and the total number of matches won by each (at home and away):

```
SELECT teamname, count(*)
FROM teams AS T, matches AS M
WHERE (T.teamno=M.Hteamno And M.Hgoals>M.Vgoals)
        OR
        (T.teamno=M.Vteamno And M.Vgoals>M.Hgoals)
GROUP BY teamno, teamname;
```

TEAMS (<u>Teamno</u>, Teamname, Town)

PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)

MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)

REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- List the **team no's** and the total number of matches won by each (at home and away):

```
SELECT teamnum, count(*)
FROM (SELECT M.Hteamno As teamnum
        FROM matches AS M
        WHERE M.Hgoals>M.Vgoals
        UNION ALL
        SELECT M.Vteamno  As teamnum
        FROM matches AS M
        WHERE M.Vgoals>M.Hgoals) AS Temp
    GROUP BY teamnum
```

TEAMS (<u>Teamno</u>, Teamname, Town)

PLAYERS (<u>Pno</u>, <u>Teamno</u>, Lname, Fname, Pbdate, Coo)

MATCHES (<u>Matchno</u>, Hteamno, Vteamno, Hgoals, Vgoals, Refno)

REFEREES (<u>Refno</u>, Lname, Fname, Rbdate)

- Find the top winners. Top winners are teams with the largest number of recorded wins for any team in the league. There can be more than one top winner team of course.

TOPWINNERS

Fenerbahçe

Galatasaray

…