Description of the Tennis Club

The tennis club was founded in 1970. From the beginning, some administrative data was stored in a database. This database consists of the following tables:

- PLAYERS
- TEAMS
- MATCHES
- PENALTIES
- COMMITTEE_MEMBERS

The PLAYERS table contains data about players who are members of the club, such as names, addresses, and dates of birth. Players can join the club only at the first of January of a year. Players cannot join the club in the middle of the year.

The PLAYERS table contains no historical data. Any player giving up membership disappears from the table. If a player moves, the old address is overwritten with the new address. In other words, the old address is not retained anywhere.

The tennis club has two types of members: recreational players and competition players. The first group plays matches only among themselves (that is, no matches against players from other clubs). The results of these friendly matches are not recorded. Competition players play in teams against other clubs, and the results of these matches are recorded. Each player, regardless of whether he or she plays competitively, has a unique number assigned by the club. Each competition player must also be registered with the tennis league, and this national organization gives each player a unique league number. If a competition player stops playing in the competition and becomes a recreational player, his or her league number correspondingly disappears. Therefore, recreational players have no league number, but they do have a player number.

The club has a number of teams taking part in competitions. The captain of each team and the division in which it is currently competing is recorded. It is not necessary for the captain to have played a match for the team. It is possible for a certain player to be captain of two or more teams at a certain time. Again, no historical data is kept in this table. If a team is promoted or relegated to another division, the record is simply overwritten with the new information. The same goes for the captain of the team; when a new captain is appointed, the number of the former captain is overwritten.

A team consists of a number of players. When a team plays against a team from another tennis club, each player of that team plays against a player of the opposing team. (For the sake of simplicity, we assume that matches in which couples play against each other, the so-called doubles and mixes, do not occur.) The team in which the most players win their matches is the winner.

A team does not always consist of the same people, and reserves are sometimes needed when the regular players are sick or on vacation. A player can play matches for several teams. So, when

we say "the players of a team," we mean the players who have played at least one match in that team. Again, only players with league numbers are allowed to play official matches.

Each match consists of a number of sets. The player who wins the most sets is the winner. Before the match begins, it is agreed how many sets need to be won to win the match. Generally, the match stops after one of the two players has won two or three sets. Possible end results of a tennis match are 21 or 20 if play continues until one player wins two sets (best of three), or 32, 31, or 30 if three sets need to be won (best of five). A player either wins or loses a match; a draw is not possible. In the MATCHES table, we record for each match separately which player was in the match and for which team he played. In addition, we record how many sets the player won and lost. From this, we can conclude whether the player won the match.

Note that the MATCHES table in this book is different in structure, layout, and contents from the MATCHES table in former editions of Introduction to SQL.

If a player behaves badly (arrives late, behaves aggressively, or does not show up at all), the league imposes a penalty in the form of a fine. The club pays these fines and records them in a PENALTIES table. If the player continues to play competitively, the record of all his or her penalties remains in this table.

If a player leaves the club, all his or her data in the five tables is destroyed. If the club withdraws a team, all data for that team is removed from the TEAMS and MATCHES tables. If a competition player stops playing matches and becomes a recreational player again, all matches and penalty data is deleted from the relevant tables.

Since January 1, 1990, a COMMITTEE_MEMBERS table has kept information about who is on the committee. There are four positions: chairman, treasurer, secretary, and a general member. On January 1 of each year, a new committee is elected. If a player is on the committee, the beginning and ending dates of his or her committee are recorded. If someone is still active, the end date remains op

The following is a description of the columns in each of the tables.

PLAYERS	
PLAYERNO	Unique player number assigned by the club.
NAME	Surname of the player, without initials.
INITIALS	Initials of the player. No full stops or spaces are used.
BIRTH_DATE	Date on which the player was born.
SEX	Sex of the player: M(ale) or F(emale).
JOINED	Year in which the player joined the club. This value cannot be smaller than 1970, the year in which the club was founded.
STREET	Name of the street on which the player lives.
HOUSENO	Number of the house.

POSTCODE	Post code.
TOWN	Town or city in which the player lives. We assume in this example that place names are unique for town or cities or, in other words, there can never be two towns with the same name.
PHONENO	Area code followed by a hyphen and then the subscriber's number.
LEAGUENO	League number assigned by the league; a league number is unique.
TEAMS	
TEAMNO	Unique team number assigned by the club.
PLAYERNO	Player number of the player who captains the team. In principle, a player may captain several teams.
DIVISION	Division in which the league has placed the team.
MATCHES	
MATCHNO	Unique match number assigned by the club
TEAMNO	Number of the team
PLAYERNO	Number of the player
WON	Number of sets that the player won in the match
LOST	Number of sets that the player lost in the match
PENALTIES	
PAYMENTNO	Unique number for each penalty the club has paid. This number is assigned by the club.
PLAYERNO	Number of the player who has incurred the penalty.
PAYMENT_DATE	Date on which the penalty was paid. The year of this date should not be earlier than 1970, the year in which the club was founded.
AMOUNT	Amount in dollars incurred for the penalty.
COMMITTEE_MEMBERS	
PLAYERNO	The number of the player.
BEGIN_DATE	Date on which the player became an active member of the committee. This date should not be earlier than January 1, 1990, because this is the date on which the club started to record this data.
END_DATE	Date on which the player resigned his position in the committee. This date should not be earlier than the BEGIN_DATE but can be absent.
POSITION	Name of the position.

Integrity Constraints

The contents of the tables must, of course, satisfy a number of integrity constraints. Two players, for example, may not have the same player number, and every player number in the PENALTIES table must also appear in the MATCHES table. In this section, we list all the applicable integrity constraints.

A primary key has been defined for each table. The following columns are the primary keys for their respective tables. Following figure contains a diagram of the database.

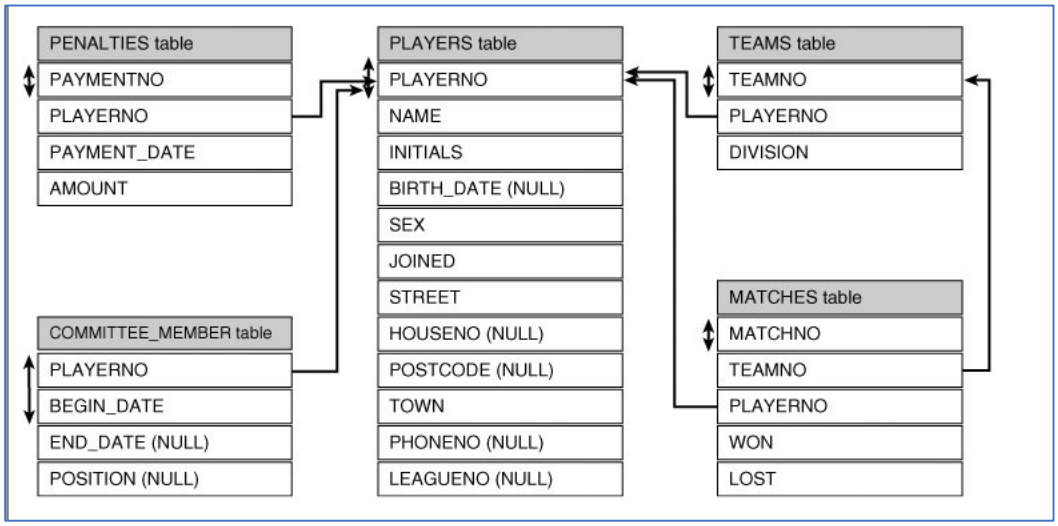

Figure 1. Diagram of the relationships between the tennis club database tables

A double-headed arrow at the side of a column (or combination of columns) indicates the primary key of a table:

- PLAYERNO of PLAYERS
- TEAMNO of TEAMS
- MATCHNO of MATCHES
- PAYMENTNO of PENALTIES
- PLAYERNO plus BEGIN_DATE of COMMITTEE_MEMBERS

The database supports five foreign keys. The foreign keys are as follows:

- From TEAMS to PLAYERS Each captain of a team is also a player. The set of player numbers from the TEAMS table is a subset of the set of player numbers from the PLAYERS table.
- From MATCHES to PLAYERS Each player who competes for a particular team must appear in the PLAYERS table. The set of player numbers from the MATCHES table is a subset of the set of player numbers from the PLAYERS table.
- From MATCHES to TEAMS Each team that appears in the MATCHES table must also be present in the TEAMS table because a player can compete for only a registered team. The

set of team numbers from the MATCHES table is a subset of the set of team numbers from the TEAMS table.
- From PENALTIES to PLAYERS A penalty can be imposed on only players appearing in the PLAYERS table. The set of player numbers from the PENALTIES table is a subset of the set of player numbers from the PLAYERS table.
- From COMMITTEE_MEMBERS to PLAYERS Each player who is or was a member of the committee must also be present in the PLAYERS table. The set of player numbers from the COMMITTEE_MEMBERS table is a subset of the set of player numbers from the PLAYERS table.

The following integrity constraints also hold:

- The year of birth of a player must be earlier than the year in which he or she joined the club.
- The sex of a player should always be an M or an F.
- The year in which the player joined the club should be greater than 1969 because the tennis club was founded in 1970.
- The postcode must always be a code of six characters.
- The division of a team can be nothing but first or second.
- Both the columns WON and LOST must have a value between 0 and 3.
- The payment date should be January 1, 1970, or later.
- Each penalty amount must always be greater than zero.
- The begin date in the COMMITTEE_MEMBERS table should always be later than or equal to January 1, 1990, because the recording of this data was started on that day.
- The end date on which the player ended service as a committee member must always be later than the begin date.

Creating Tables

1. Create the five tables, with constraints, that form the Tennis_club database.

Populating Tables with Data

2. The tables have been created and can now be filled with data. For this, we use INSERT statements.

The Contents of the Tables

The contents of the tables are shown here. These rows of data form the basis of most of the examples and exercises. Some of the column names in the PLAYERS table have been shortened because of space constraints.

The PLAYERS table:

```
PLAYERNO NAME      INIT BIRTH_DATE SEX JOINED STREET          ...
-------- --------- ---- ---------- --- ------ --------------  ---
```

```
  2 Everett   R    1948-09-01 M   1975   Stoney Road     ...
  6 Parmenter R    1964-06-25 M   1977   Haseltine Lane  ...
  7 Wise      GWS  1963-05-11 M   1981   Edgecombe Way   ...
  8 Newcastle B    1962-07-08 F   1980   Station Road    ...
 27 Collins   DD   1964-12-28 F   1983   Long Drive      ...
 28 Collins   C    1963-06-22 F   1983   Old Main Road   ...
 39 Bishop    D    1956-10-29 M   1980   Eaton Square    ...
 44 Baker     E    1963-01-09 M   1980   Lewis Street    ...
 57 Brown     M    1971-08-17 M   1985   Edgecombe Way   ...
 83 Hope      PK   1956-11-11 M   1982   Magdalene Road  ...
 95 Miller    P    1963-05-14 M   1972   High Street     ...
100 Parmenter P    1963-02-28 M   1979   Haseltine Lane  ...
104 Moorman   D    1970-05-10 F   1984   Stout Street    ...
112 Bailey    IP   1963-10-01 F   1984   Vixen Road      ...
```

The PLAYERS table (continued):

```
PLAYERNO ... HOUSENO POSTCODE TOWN      PHONENO    LEAGUENO
-------- --- ------- -------- --------- ---------- --------
       2 ... 43      3575NH   Stratford 070-237893 2411
       6 ... 80      1234KK   Stratford 070-476537 8467
       7 ... 39      9758VB   Stratford 070-347689 ?
       8 ... 4       6584RO   Inglewood 070-458458 2983
      27 ... 804     8457DK   Eltham    079-234857 2513
      28 ... 10      1294QK   Midhurst  071-659599 ?
      39 ... 78      9629CD   Stratford 070-393435 ?
      44 ... 23      4444LJ   Inglewood 070-368753 1124
      57 ... 16      4377CB   Stratford 070-473458 6409
      83 ... 16A     1812UP   Stratford 070-353548 1608
      95 ... 33A     5746OP   Douglas   070-867564 ?
     100 ... 80      1234KK   Stratford 070-494593 6524
     104 ... 65      9437AO   Eltham    079-987571 7060
     112 ... 8       6392LK   Plymouth  010-548745 1319
```

The TEAMS table:

```
TEAMNO  PLAYERNO  DIVISION
------  --------  --------
     1         6  first
     2        27  second
```

The MATCHES table:

```
MATCHNO  TEAMNO  PLAYERNO  WON  LOST
-------  ------  --------  ---  ----
      1       1         6    3     1
      2       1         6    2     3
      3       1         6    3     0
      4       1        44    3     2
      5       1        83    0     3
      6       1         2    1     3
```

7	1	57	3	0
8	1	8	0	3
9	2	27	3	2
10	2	104	3	2
11	2	112	2	3
12	2	112	1	3
13	2	8	0	3

The PENALTIES table:

PAYMENTNO	PLAYERNO	PAYMENT_DATE	AMOUNT
1	6	1980-12-08	100.00
2	44	1981-05-05	75.00
3	27	1983-09-10	100.00
4	104	1984-12-08	50.00
5	44	1980-12-08	25.00
6	8	1980-12-08	25.00
7	44	1982-12-30	30.00
8	27	1984-11-12	75.00

The COMMITTEE_MEMBERS table:

PLAYERNO	BEGIN_DATE	END_DATE	POSITION
2	1990-01-01	1992-12-31	Chairman
2	1994-01-01	?	Member
6	1990-01-01	1990-12-31	Secretary
6	1991-01-01	1992-12-31	Member
6	1992-01-01	1993-12-31	Treasurer
6	1993-01-01	?	Chairman
8	1990-01-01	1990-12-31	Treasurer
8	1991-01-01	1991-12-31	Secretary
8	1993-01-01	1993-12-31	Member
8	1994-01-01	?	Member
27	1990-01-01	1990-12-31	Member
27	1991-01-01	1991-12-31	Treasurer
27	1993-01-01	1993-12-31	Treasurer
57	1992-01-01	1992-12-31	Secretary
95	1994-01-01	?	Treasurer
112	1992-01-01	1992-12-31	Member
112	1994-01-01	?	Secretary

Assignment:

1. For each player living in Stratford, get the first name, the last name, and the league number. If the league number is `NULL`, give the value `1`.
2. For the players who were born on a Saturday, get the number, the date of birth, and the date that comes 7 days after that date of birth.
3. Get the numbers of the penalties that were paid on a Monday.
4. Find the player number for each player who has incurred at least two penalties of more than $25; order the result by player number (the smallest number first).
5. Get the payment number, the player number, and the date of each penalty incurred in the year in which the player concerned joined the club.
6. Get the numbers and names of the players who live in the same town as player 27. Player 27 should not appear in the end result.
7. For all the players, find the player number, the name, and the penalties incurred by him or her; order the result by player number
8. Get the names and initials of the players who are not team captains.
9. For each team that is captained by a player resident in “Eltham”, get the team number and the number of matches that has been played for that team.
10. Get the player number and the total amount of penalties for the player with the highest penalty total.
11. Create a stored procedure that removes all matches played by a specific player.
12. Create a stored procedure that calculates the total of the penalties of a certain player. After that, call the procedure for player 27.
13. Create a stored procedure that retrieves the address of a player.
14. Create a stored procedure that removes a player. Imagine that the following rule applies: A player can be removed only if he or she has incurred no penalty and only if he or she is not a captain of a team. It is also assumed that no foreign keys have been defined.
15. Create two stored functions that determine, respectively, the number of penalties and the number of matches of a certain player. After that, get the numbers, names, and initials of those players whose number of penalties is greater than the number of matches.

Deadline of Submission : 9th July 2023 (End of Day)