Advance Database Management System [C]
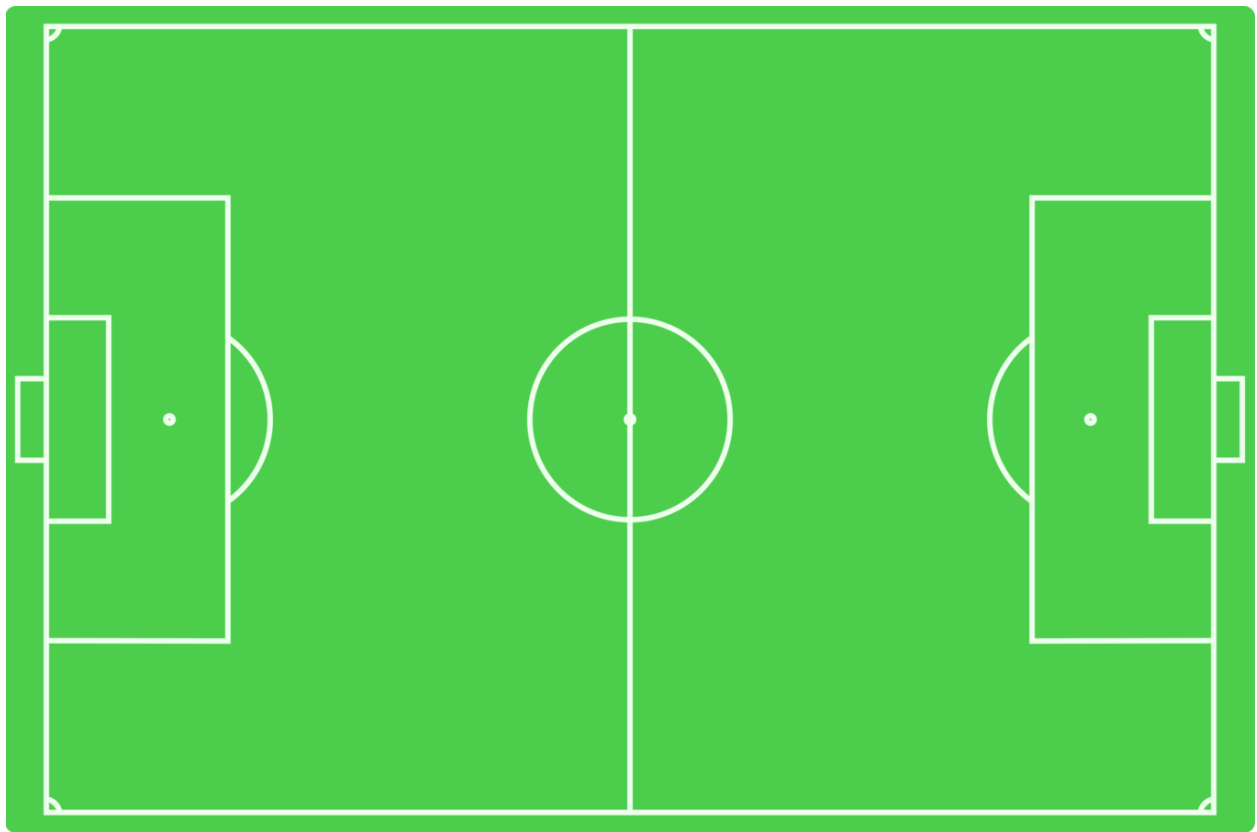
Football Team Management [Forca Barca]
Final Term Project Report

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Group Name	Uno
Student Name	Afique Sadique
ID	19-39708-1
Section	C
Submission to	REZWAN AHMED
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Table Of Contents

System Summery

This project is based on one of the Spanish club – Football Club Barcelona and it's team management database system. FCB participates in numerous tournament (Laliga, European league Cup, Domestic league Cup and so on). In La liga, the team takes part in 38 matches. Also, in other tournament's matches. Each of the matches are known as Match-day. Developing this vast connection. time and man-power are required.
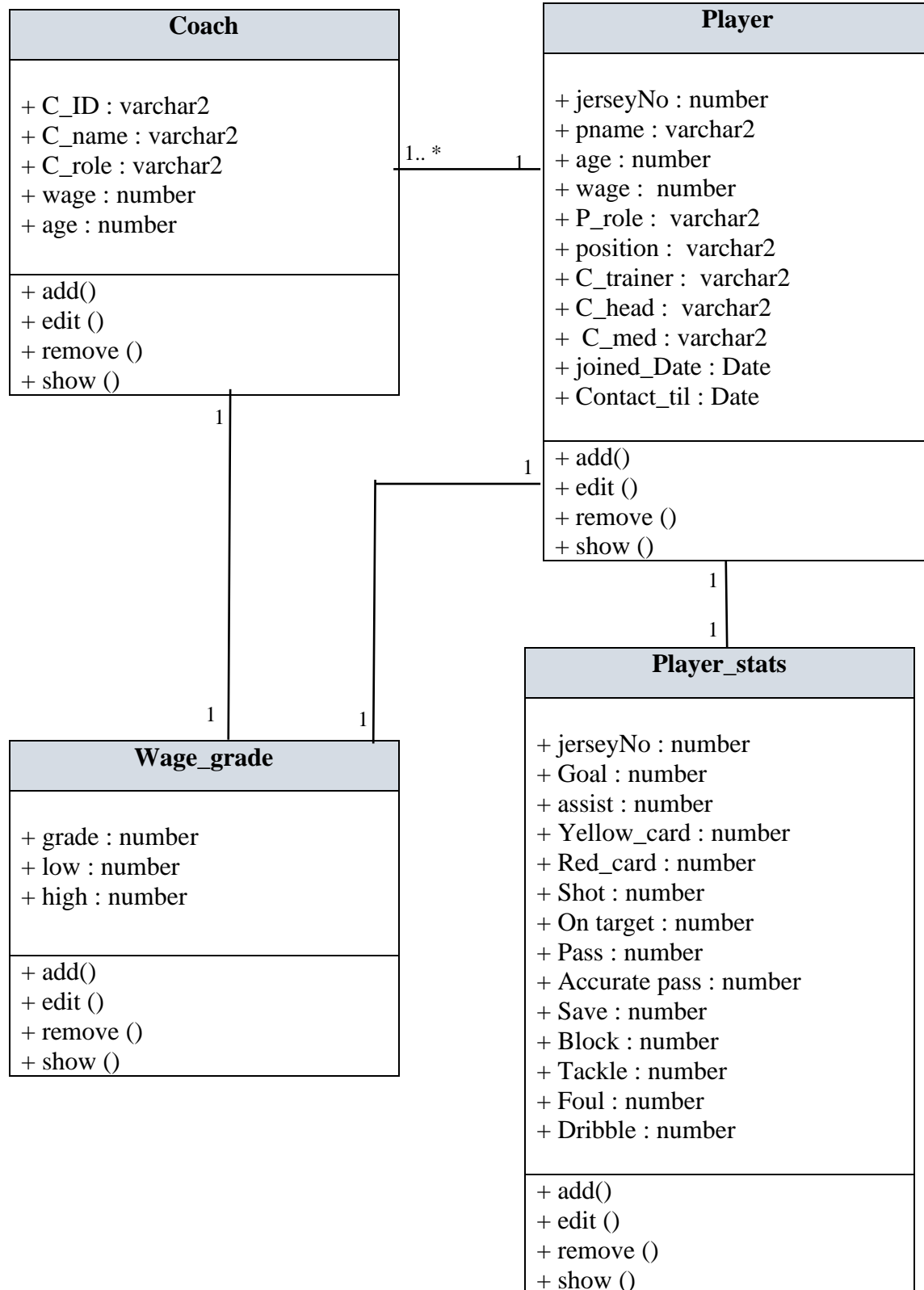
The motivation was to create a fully connected and automated Team Management System. However, depending on the circumstances the goal became to analyze player-coach relationship and their performance.

- The database has 5 tables which are interconnected. Login info, Coach, Player, Wage of the employees and Player's statistics.
- 3 tables to store trigger values.
- LOGIN_INFO has the 4 columns. userID as primary key, username, password, role.
- COACH table has a primary key ID as C_ID and other attributes (which are later discussed in the Database Schema section).
- The PLAYER table has one foreign key and a primary key. The primary key is 'Jersey no' as it's unique for every player. The foreign keys are distributed in three (3) columns, which are c_head, c_trainer, c_medical which are referenced by COACH table's primary key (C_ID). Since there are three different categories of coach (c_role) so, it's divided into three columns in PLAYER table.
- In PLAYER_STATS table JerseyNo is the foreign key, referenced by PLAYER table. In this table the attributes are different stats (goal, assist, save, block, etc.) of a player.
- The WAGE_GRADE tables have 3 columns. Every coach and player wage's grade are distributed here by a low and high range. There are 5 different values of grade which are low, below avg, avg, above avg and high (in ascending order).
- A VIEW is created to select players in squad. (`squad_view`)
- When player/coach/user's info is changed, the modification in stored as log. (Trigger)

Another table MATCH_DAY was planned to create but wasn't implemented. For every matchday a table would be generated and the attributes of the table would be team's performance in that game/match. For example, Ball possession, Cards, Shots, Goal scored, Goal concede etc. by a team. FCB plays almost 50+ games in a season. So, generating and maintaining MATCH_DAY tables would be complex. In the project this tables are excluded for the time being.

To conclude project details, this database can improve player-coach relationship by analyzing the performance of them. Tactics can be developed by coaches to improve the performance of the team and select appropriate players into the squad.

Class Diagram

Coach

+ C_ID : varchar2
+ C_name : varchar2
+ C_role : varchar2
+ wage : number
+ age : number

+ add()
+ edit ()
+ remove ()
+ show ()

Player

+ jerseyNo : number
+ pname : varchar2
+ age : number
+ wage : number
+ P_role : varchar2
+ position : varchar2
+ C_trainer : varchar2
+ C_head : varchar2
+ C_med : varchar2
+ joined_Date : Date
+ Contact_til : Date

+ add()
+ edit ()
+ remove ()
+ show ()

1.. *   1

1

1

1   1

1

1

Wage_grade

+ grade : number
+ low : number
+ high : number

+ add()
+ edit ()
+ remove ()
+ show ()

Player_stats

+ jerseyNo : number
+ Goal : number
+ assist : number
+ Yellow_card : number
+ Red_card : number
+ Shot : number
+ On target : number
+ Pass : number
+ Accurate pass : number
+ Save : number
+ Block : number
+ Tackle : number
+ Foul : number
+ Dribble : number

+ add()
+ edit ()
+ remove ()
+ show ()

Database Schema

COACH table:

Column Name	Data Type	Nullable	Default	Primary Key
C_ID	VARCHAR2(4000)	No	-	1
C_NAME	VARCHAR2(4000)	Yes	-	-
C_ROLE	VARCHAR2(4000)	Yes	-	-
WAGE	NUMBER	Yes	-	-
AGE	NUMBER	Yes	-	-
				1 - 5

PLAYER table:

Tables

COACH
COACH_INFO_LOG_DATA
LOGIN_INFO
LOGIN_INFO_LOG_DATA
PLAYER
PLAYER_INFO_LOG_DATA
P_STATS
TEMP
WAGE_GRADE

PLAYER

Table   Data   Indexes   Model   Constraints   Grants   Statistics   UI Defaults   Triggers   Depe

Add Column   Modify Column   Rename Column   Drop Column   Rename   Copy   Drop   T

Column Name	Data Type	Nullable	Default	Primary Key
JERSEYNO	NUMBER	No	-	1
PNAME	VARCHAR2(400)	No	-	-
AGE	NUMBER	No	-	-
WAGE	NUMBER	No	-	-
POSITION	VARCHAR2(4000)	No	-	-
P_ROLE	VARCHAR2(4000)	No	-	-
C_TRAINER	VARCHAR2(400)	No	-	-
C_MEDICAL	VARCHAR2(400)	No	-	-
C_HEAD	VARCHAR2(400)	No	-	-
JOINED_DATE	DATE	Yes	-	-
CONTACT_TILL	DATE	Yes	-	-
RATING	NUMBER	Yes	-	-
				1 - 12

WAGE_GRADE table:

Column Name	Data Type	Nullable	Default	Primary Key
GRADE	VARCHAR2(4000)	Yes	-	-
MIN_WAGE	NUMBER	Yes	-	-
MAX_WAGE	NUMBER	Yes	-	-
				1 - 3

P_stats table:

Column Name	Data Type	Nullable	Default	Primary Key
JERSEYNO	NUMBER	No	-	-
GOAL	NUMBER	Yes	-	-
ASSIST	NUMBER	Yes	-	-
YELLOW_CARD	NUMBER	Yes	-	-
RED_CARD	NUMBER	Yes	-	-
SHOT	NUMBER	Yes	-	-
SHOT_ONTARGET	NUMBER	Yes	-	-
PASS	NUMBER	Yes	-	-
ACCURATE_PASS	NUMBER	Yes	-	-
DRIBBLE	NUMBER	Yes	-	-
TACKLE	NUMBER	Yes	-	-
FOUL	NUMBER	Yes	-	-
SAVE	NUMBER	Yes	-	-
BLOCK	NUMBER	Yes	-	-
MATCH_PLAYED	NUMBER	Yes	-	-
MINS_PLAYED	NUMBER	Yes	-	-
				1 - 16

VIEW

Views

SQUAD_VIEW

SQUAD_VIEW

View   Code   Data   Grants   UI Defaults   Dependencies   SQL

Compile   Drop

Column Name	Data Type	Nullable
JERSEYNO	NUMBER	No
NAME	VARCHAR2(400)	No
ROLE	VARCHAR2(4000)	No
POSITION	VARCHAR2(4000)	No
RATING	NUMBER	Yes

Sequence In Primary Key

Auto increment is used in C_ID and JerseyNO attribute of COACH and PLAYER table.

Application Interface

Two types of users are in the application, i. Admin, ii. Coach. Based on credentials of user's role Forms are shown.

Different types of functionalities of the users are:
Admin – *Create new users. *Modify (Create, Update, Remove) coach/player. *Browse history.
Coach – *Select players to squad. *Analyze player's statistics.

Overview of the application directory is shown below:
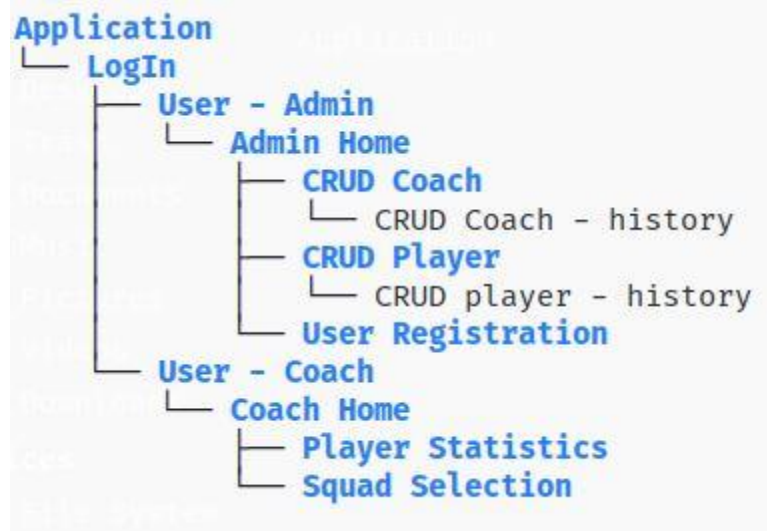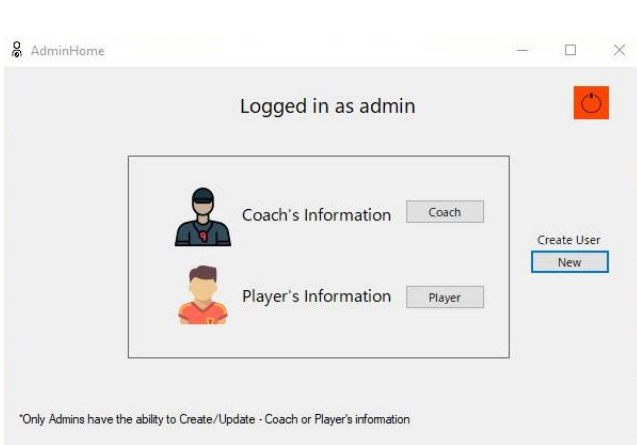
Log In:

After logging in Connection to Oracle Database is established. User will be redirected to its accessible pages.

Admin Panel
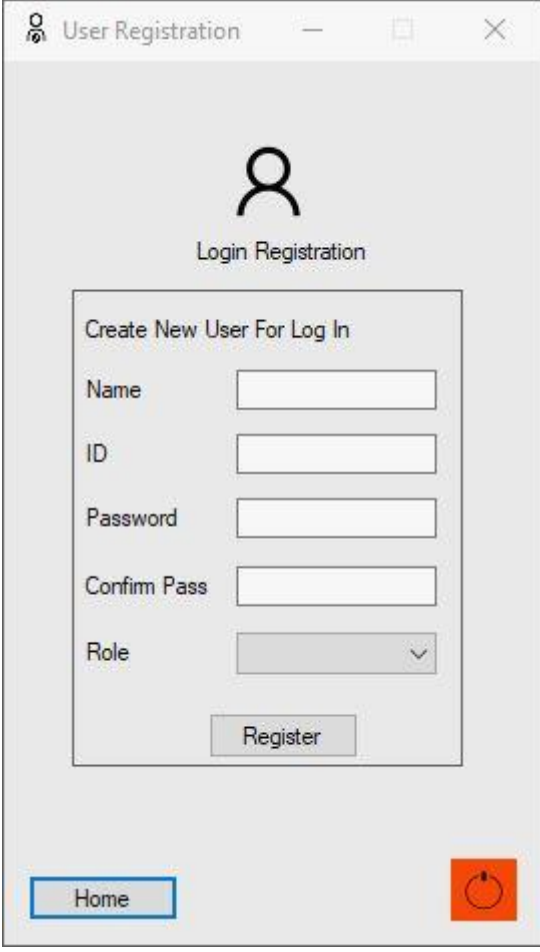
Home –	Registration-

After clicking 'New' button, new user can be registered. | |

Functionalities:

^ Text box can't be empty.

^ All the values to be inserted into textbox are Capitalized while typing. So that the problem with case sensitivity is avoided.

^ ID is primary key with dot (.) separating values, no space. (ex. mono.stro)

^ Password and Confirm Password should match.

^ Role can only be selected from drop down box, can't be edited.

^ After registration values will be inserted in Database Table. Because of trigger log data is also inserted in Table.

CRUD coach

Functionalities:
^ After selecting a row to modify, ID field is visible. (ID – auto incremented after insertion)
^ Searching data based on every existing field.
^ History of CRUD operations.
^ Constraint for Head coach. Can't be more than one. ID 1 is designated. Can't be removed.

CRUD Player

Functionalities:
   ^ Searching while typing in textbox.
   ^ Multiple fields for searching.
   ^ Position (RB..LB) can't be selected without selecting Role (Defender..Attacker) first.

Coach Panel

Home –

Purpose of the buttons:
Squad – Go to Squad Form to select players to squad.
Player - Go to Player Stats Form to analyze player's statistics.

Squad Selection Form in the next page
(functionalities)
- By clicking 'Best 11' button select best players in the squad.
- By searching depending on different categories (Name, Jersey No, Position, Role, Rating) player can be found and then selected in the squad.
- Without selecting role, position can't be selected.
- When position is selected, the targeted position in squad is highlighted (RW in the example). So that user can visualize the position and select the player appropriately.
- Player's position can be modified.
  (RW → CF or, CDM → CM)
- 'Add To Squad' button to add the selected player into squad

Squad Selection –

Trigger is implemented for DML operation for Player, Coach and for Login User creation.

- After trigger is triggered, values are inserted in designated table. For which the history can be checked and maintain.
- Before trigger is triggered to secure operations from unwanted day/time operations.

The triggers that are used –

COACH_INFO_TRIGGER, PLAYER_INFO_TRIGGER, LOGIN_INFO_TRIGGER

Conclusion

The application can be used to display squad members when there is a football event in the campus. It will be easier for coaches/moderators to plan their strategy as well as audience can have visualization about the team's squad members. Since using the application, the teams squad members (11 players) can be easily implemented.

THE END