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IFSC 3330

Option 1: Pick an application database and provide a detailed description about the database. The real-world entities, their relationships, and some of constraints of this application database shall be specified at this stage. Your future design and implementation of the database shall comply with the description. Make sure you explain your assumptions and design goals.

The following application models NFL teams, the games they play, the referees , and the players in each team
- We have a set of **Teams**, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.
- Each team has many **Players**, and each player belongs to one team. Each player has a Player_id (unique identifier), name, DoB, start year, and Jersey_num that he wears.
- Teams play **Games**, in each game there is a home team and an away team. The games take place in the stadium of the home team.
- For each game we need to keep track of the following:
  - ❖ **The date on which the game is played**
  - ❖ **The result of the game**
  - ❖ **During the game, one player may substitute another player. We want to track the substitutions.**
- Each match has exactly three **Referees**. For each referee we have a Ref_id (unique identifier), name, DoB, years of experience.

Assumptions:
  I. **Game-Player** entity, we will add a unique identifier for each substitution, the number of yards gained, and each time a player score.
  II. The result in Games entity is tracked using two attributes Home_Score and Away_Score.
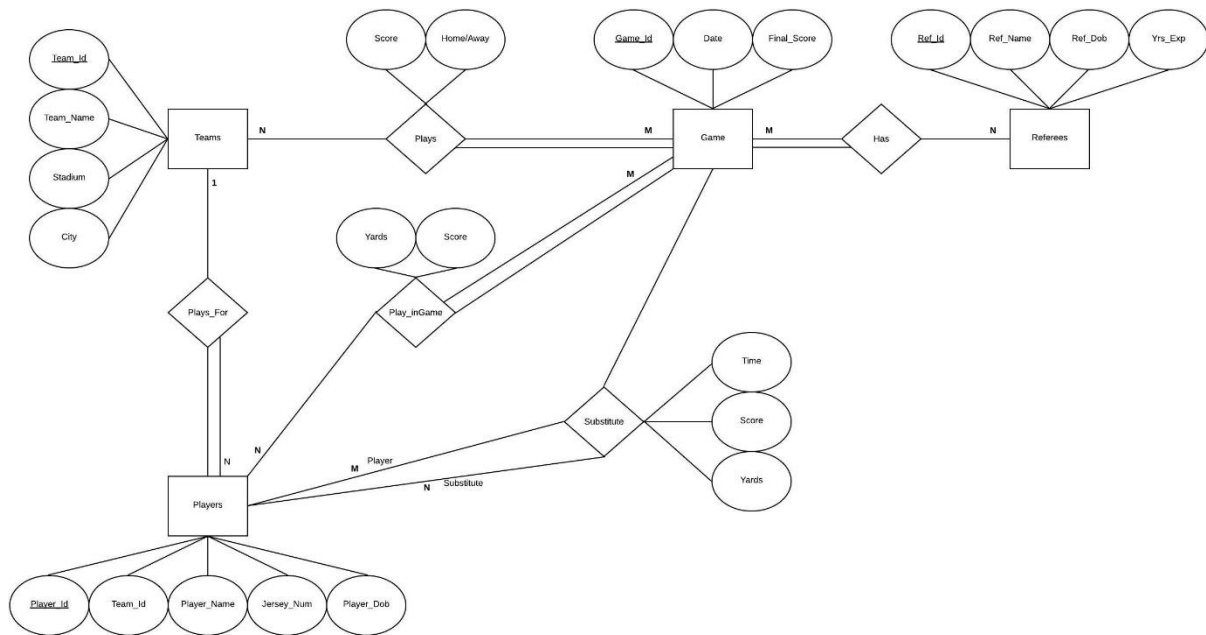
NFL_GAME(Team_id, Game_id, Ref_id, Player_id, Sub_id, Team_Name, Stadium, City, Game_Date, Final_Score, Ref_Name, Ref_DOB, Yrs_Exp, Player_Name, Jersey_Num, Player_DOB, Score, Home/ Away, Points_Scored, Yards)

Team_id → Team_Name, Stadium, City
Game_id→ Game_Date, Final_Score
Ref_id→ Name, DOB, Yrs_Exp
Player_id → Team_id, Name, Jersey_Num, DOB
Team_id, Game_id→ Final_Score, Home/ Away
Player_id, Game_id → Points_Scored, Yards
Sub_id, Player_id, Game_id → Points_Scored, Yards

Teams(Team_id, Team_Name, Stadium, City)
Game(Game_id, Game_Date, Final_Score)
Referees(Ref_id, Ref_Name, Ref_DOB, Yrs_Exp)
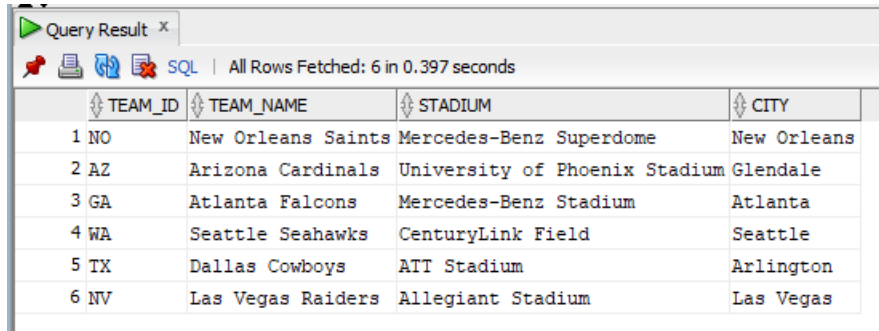**Players**(Player_id, Team_id, Player_Name, Jersey_Num, Player_DOB)
Plays(Team_id, Game_id, Score, Home/ Away)
Plays_inGame (Player_id, Game_id, Score, Yards)
Substitute(Player_id, Sub_id, Game_id, Time, Score, Yard)

Teams(Team_id, Team_Name, Stadium, City)
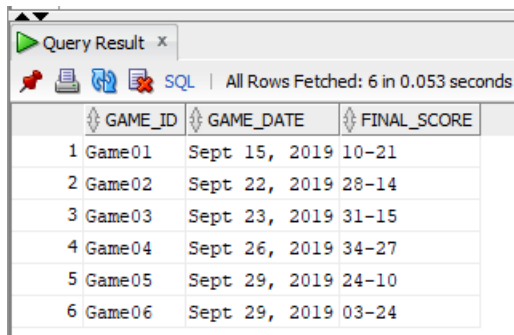Team_id → Team_Name, Stadium, City

	TEAM_ID	TEAM_NAME	STADIUM	CITY
1	NO	New Orleans Saints	Mercedes-Benz Superdome	New Orleans
2	AZ	Arizona Cardinals	University of Phoenix Stadium	Glendale
3	GA	Atlanta Falcons	Mercedes-Benz Stadium	Atlanta
4	WA	Seattle Seahawks	CenturyLink Field	Seattle
5	TX	Dallas Cowboys	ATT Stadium	Arlington
6	NV	Las Vegas Raiders	Allegiant Stadium	Las Vegas

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Game(Game_id, Game_Date, Final_Score)
Game_id→ Game_Date, Final_Score

	GAME_ID	GAME_DATE	FINAL_SCORE
1	Game01	Sept 15, 2019	10-21
2	Game02	Sept 22, 2019	28-14
3	Game03	Sept 23, 2019	31-15
4	Game04	Sept 26, 2019	34-27
5	Game05	Sept 29, 2019	24-10
6	Game06	Sept 29, 2019	03-24
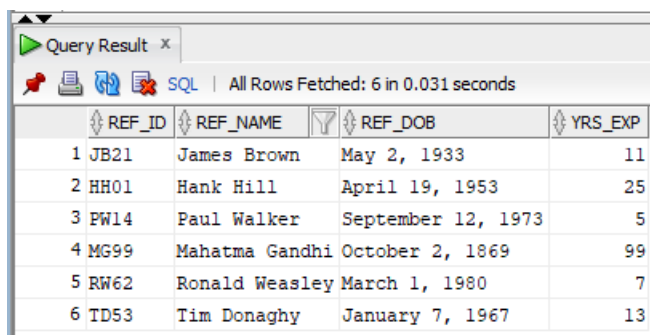
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Referees(Ref_id, Ref_Name, Ref_DOB, Yrs_Exp)
Ref_id→ Name, DOB, Yrs_Exp

	REF_ID	REF_NAME	REF_DOB	YRS_EXP
1	JB21	James Brown	May 2, 1933	11
2	HH01	Hank Hill	April 19, 1953	25
3	PW14	Paul Walker	September 12, 1973	5
4	MG99	Mahatma Gandhi	October 2, 1869	99
5	RW62	Ronald Weasley	March 1, 1980	7
6	TD53	Tim Donaghy	January 7, 1967	13
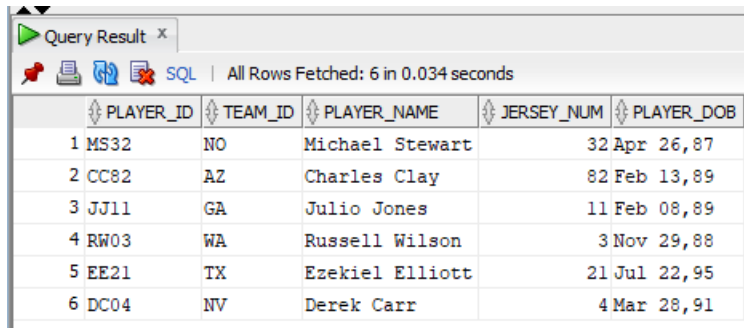
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Players(Player_id, Team_id, Player_Name, Jersey_Num, Player_DOB)
Player_id → Team_id, Name, Jersey_Num, DOB

	PLAYER_ID	TEAM_ID	PLAYER_NAME	JERSEY_NUM	PLAYER_DOB
1	MS32	NO	Michael Stewart	32	Apr 26,87
2	CC82	AZ	Charles Clay	82	Feb 13,89
3	JJ11	GA	Julio Jones	11	Feb 08,89
4	RW03	WA	Russell Wilson	3	Nov 29,88
5	EE21	TX	Ezekiel Elliott	21	Jul 22,95
6	DC04	NV	Derek Carr	4	Mar 28,91
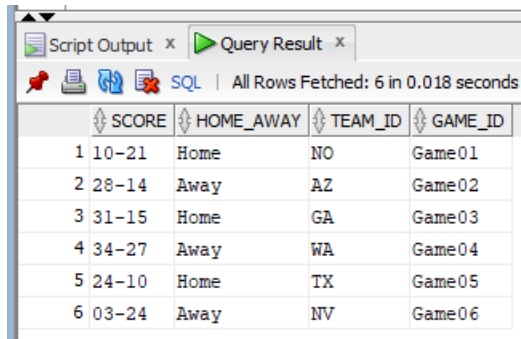
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Plays(Team_id, Game_id, Score, Home/ Away)
Team_id, Game_id → Score, Home/ Away

	SCORE	HOME_AWAY	TEAM_ID	GAME_ID
1	10-21	Home	NO	Game01
2	28-14	Away	AZ	Game02
3	31-15	Home	GA	Game03
4	34-27	Away	WA	Game04
5	24-10	Home	TX	Game05
6	03-24	Away	NV	Game06
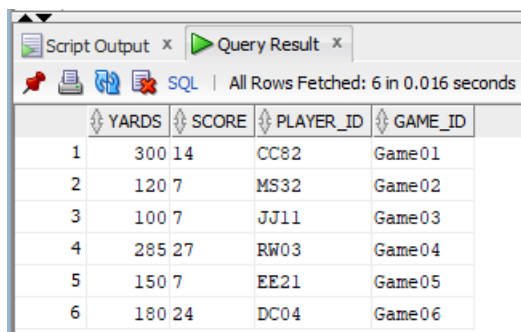
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Plays_inGame (Player_id, Game_id, Score, Yards)
Player_id, Game_id → Score, Yards

	YARDS	SCORE	PLAYER_ID	GAME_ID
1	300	14	CC82	Game01
2	120	7	MS32	Game02
3	100	7	JJ11	Game03
4	285	27	RW03	Game04
5	150	7	EE21	Game05
6	180	24	DC04	Game06
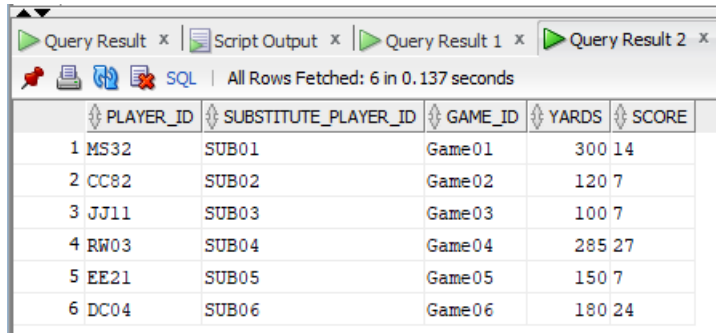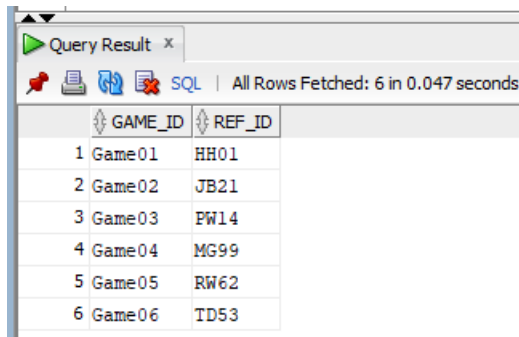
All Rows Fetched: 6 in 0.016 seconds

Substitute(<u>Player_id</u>, <u>Sub_id</u>, <u>Game_id</u>, Time, Score, Yard)
<u>Sub_id</u>, <u>Player_id</u>, <u>Game_id</u> → Playing_Time, Score, Yards
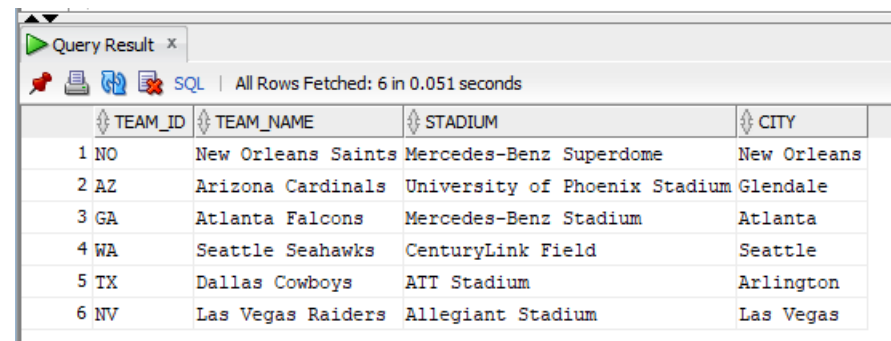
	PLAYER_ID	SUBSTITUTE_PLAYER_ID	GAME_ID	YARDS	SCORE
1	MS32	SUB01	Game01	300	14
2	CC82	SUB02	Game02	120	7
3	JJ11	SUB03	Game03	100	7
4	RW03	SUB04	Game04	285	27
5	EE21	SUB05	Game05	150	7
6	DC04	SUB06	Game06	180	24

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	GAME_ID	REF_ID
1	Game01	HH01
2	Game02	JB21
3	Game03	PW14
4	Game04	MG99
5	Game05	RW62
6	Game06	TD53

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Queries:

SELECT *
FROM Teams;
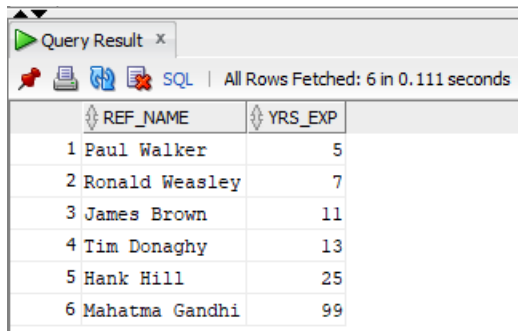
	TEAM_ID	TEAM_NAME	STADIUM	CITY
1	NO	New Orleans Saints	Mercedes-Benz Superdome	New Orleans
2	AZ	Arizona Cardinals	University of Phoenix Stadium	Glendale
3	GA	Atlanta Falcons	Mercedes-Benz Stadium	Atlanta
4	WA	Seattle Seahawks	CenturyLink Field	Seattle
5	TX	Dallas Cowboys	ATT Stadium	Arlington
6	NV	Las Vegas Raiders	Allegiant Stadium	Las Vegas

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SELECT ref_name,yrs_exp
FROM referees
ORDER BY yrs_exp;
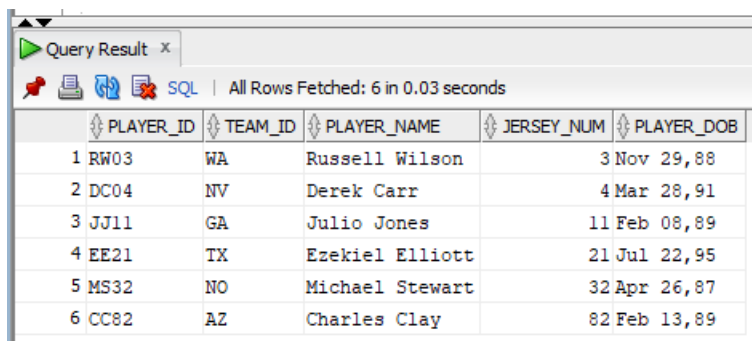
	REF_NAME	YRS_EXP
1	Paul Walker	5
2	Ronald Weasley	7
3	James Brown	11
4	Tim Donaghy	13
5	Hank Hill	25
6	Mahatma Gandhi	99

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SELECT *
FROM Players
ORDER BY jersey_num;
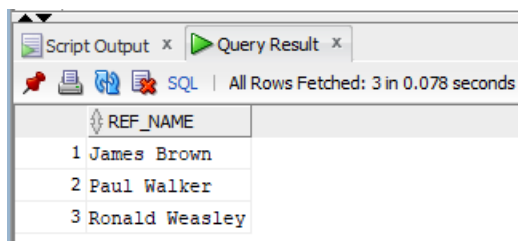
	PLAYER_ID	TEAM_ID	PLAYER_NAME	JERSEY_NUM	PLAYER_DOB
1	RW03	WA	Russell Wilson	3	Nov 29,88
2	DC04	NV	Derek Carr	4	Mar 28,91
3	JJ11	GA	Julio Jones	11	Feb 08,89
4	EE21	TX	Ezekiel Elliott	21	Jul 22,95
5	MS32	NO	Michael Stewart	32	Apr 26,87
6	CC82	AZ	Charles Clay	82	Feb 13,89

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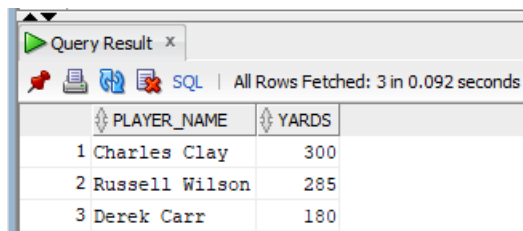
SELECT Ref_name
FROM referees, has
Where referees.ref_id = has.ref_id **AND** Game_id = 'Game03';

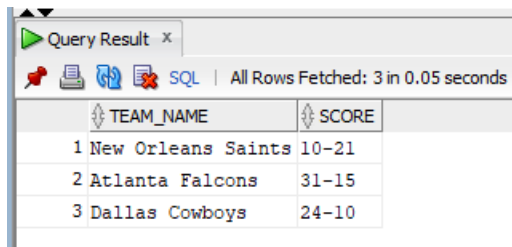|	REF_NAME
1	James Brown
2	Paul Walker
3	Ronald Weasley

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SELECT Player_Name, Yards
FROM players, plays_ingame
Where Players.Player_id = plays_ingame.player_id **AND** Yards > 150;

Query Result ×

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	PLAYER_NAME	YARDS
1	Charles Clay	300
2	Russell Wilson	285
3	Derek Carr	180

SELECT Team_Name, Score
FROM Teams, plays
Where teams.team_id = plays.team_id **AND** Home_Away = 'Home';

Query Result ×

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	TEAM_NAME	SCORE
1	New Orleans Saints	10-21
2	Atlanta Falcons	31-15
3	Dallas Cowboys	24-10