**Alex’s Analytics**

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IST 659

**Summary**

Alex’s Analytics is a new company specializing in sports analytics with the goal of being able to predict outcomes of high school football games in the Pittsburgh area. Being in the very early stages, the CEO and founder of the company wants to first start with designing and structuring a data model. While the initial data design will be very basic an initial foundation needs to be created in order to build and grow data model. The first phase will include defining the entities and relationships by determining business rules, providing a data glossary, identifying the questions we would like to answer and displaying a conceptual and logical model.

**Stakeholders**

The stakeholders for this endeavor include the CEO, stats reporters, the football teams and football fans, who live for high school football in the Pittsburgh area. As of now, various stats reporters attend games and record the stats from the games. Each reporter records stats in their own fashion, for example, some write the stats down with paper and pencil and others will record stats on a laptop. Being able to implement a database to store and make this data readily available will allow for the company to accumulate and analyze the data in order to make predictions on who will win game. Another advantage of being able to store this data in a database is to be able to compare teams’ performances from year to year.

**Business Rules**

* A team plays many games.
* More than one team plays a game.
* A stadium hosts many games.
* A team produces many stats.
* A game produces many stats.

**Glossary**

A **Team** is the one who plays in a game.

A **Stadium** is the venue a game is played.

A **Game** is played by 2 teams in a stadium.

A **Home Team** is the one who hosts the game in their stadium.

An **Away Team** is the one who plays in the Home Teams stadium.

A **Game Date** is the date for which a game is played.

A **Stat** is a measure of performance by a team.

A **Rushing Touchdown** is a way to score points by running the ball.

A **Passing Touchdown** is a way to score points by passing the ball.

**Total Points Scored** is an amount achieved by a team at the end of a game.

**Total Points Allowed** is an amount scored by the opposing team.

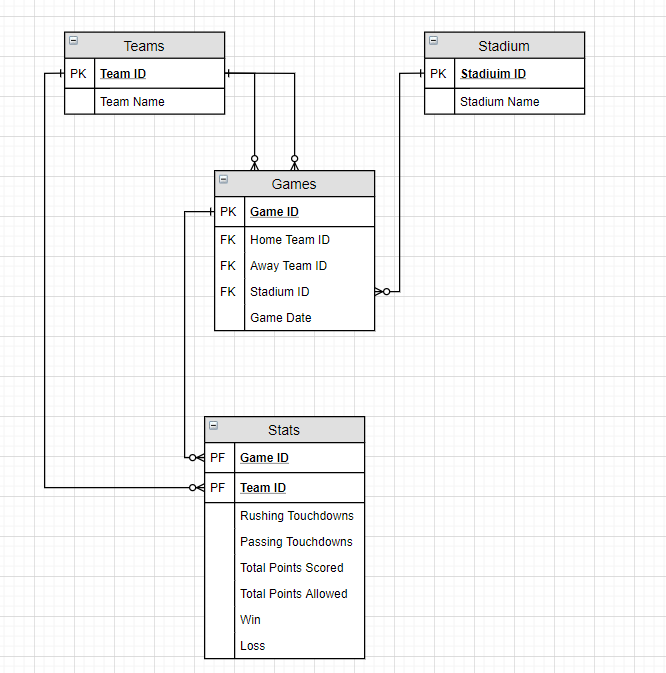
A **Win** is when Total Points Scored is greater than Total Points Allowed in a game.

A **Loss** is when Total Points Scored is less than Total Points Allowed in a game.

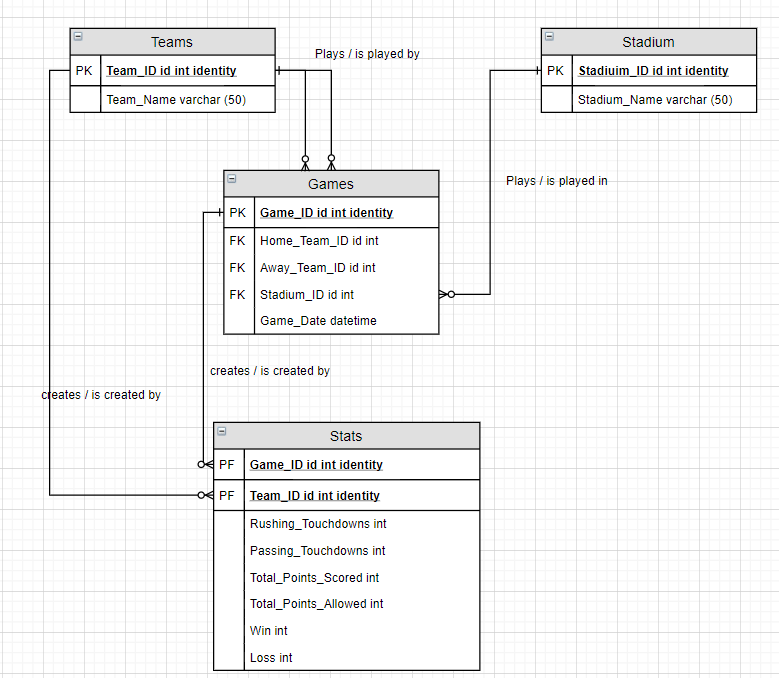
**Data Questions**

* Which teams have the best Total Points Scored to Total Points Allowed Ratio?
* Which teams have the most Passing Touchdowns?
* Which teams have the most Rushing Touchdowns?
* Which Stadium has the most points scored in it?
* Calculate Points scored when a team is Home VS. Away

**Conceptual Model**

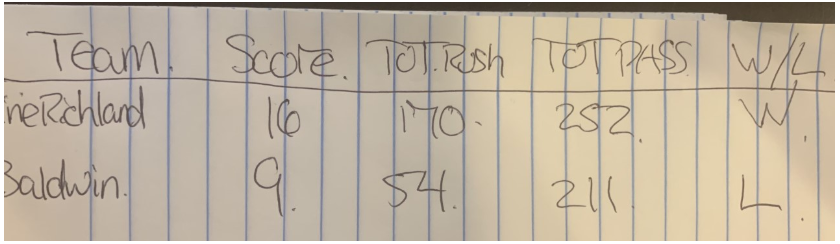


**Logical Model**



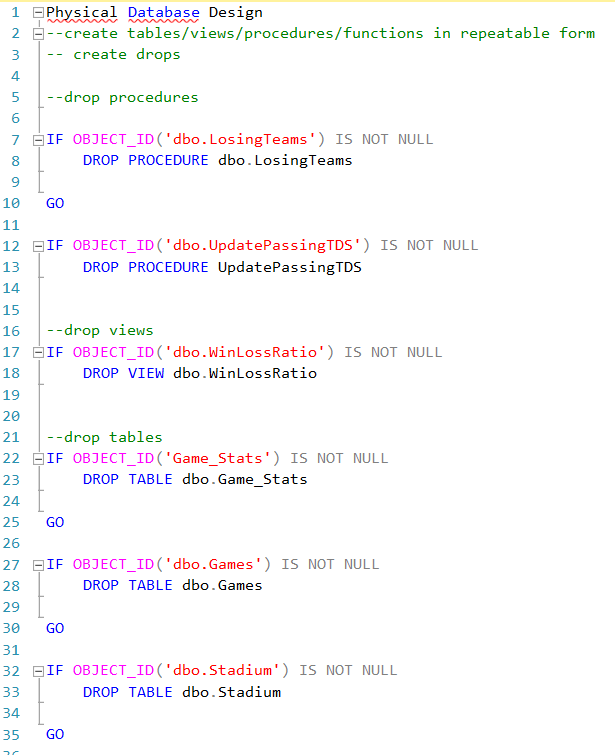
**Raw Data Sample**

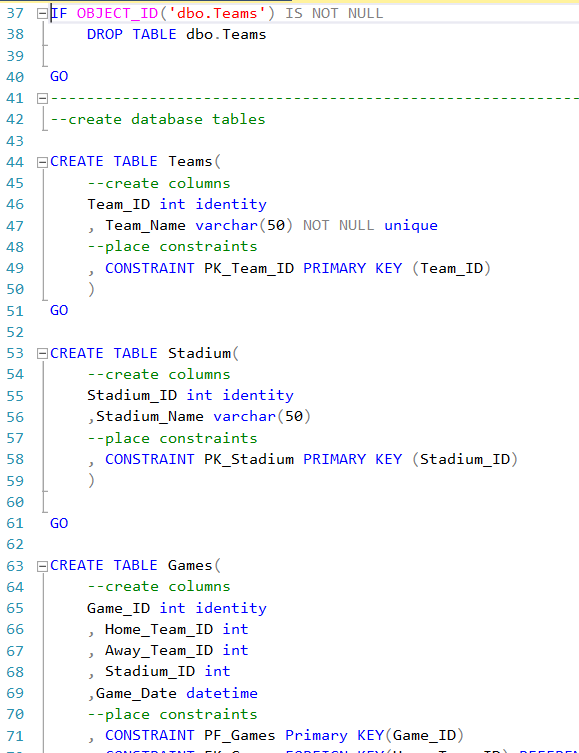
|  |  |  |
| --- | --- | --- |
|  | **Home Team** | **Away Team** |
|  | Upper Saint Clair Panthers | Mount Lebanon Blue Devils |
| **Final Score** | 30 | 24 |
| **Total Rushing Yards** | 123 | 89 |
| **Total Passing Yards** | 310 | 323 |
| **Win/Loss** | W | L |
|  |  |  |
|  |  |  |
|  | **Home Team** | **Away Team** |
|  | Bethel Park Blackhawks | Peters Township Indians |
| **Final Score** | 24 | 13 |
| **Total Rushing Yards** | 75 | 64 |
| **Total Passing Yards** | 240 | 176 |
| **Win/Loss** | W | L |

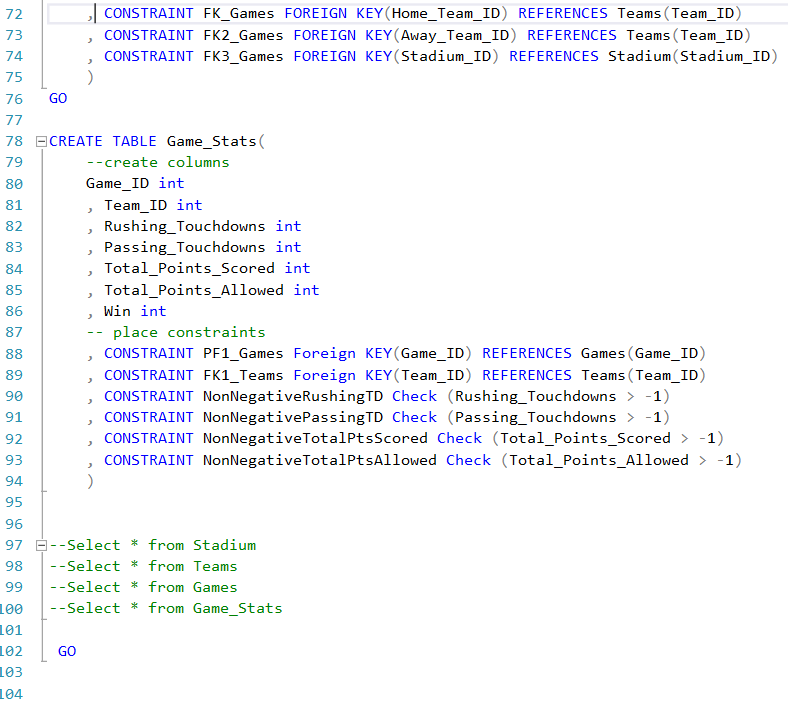


**Physical Database Design**

**--Screenshots from SQL**

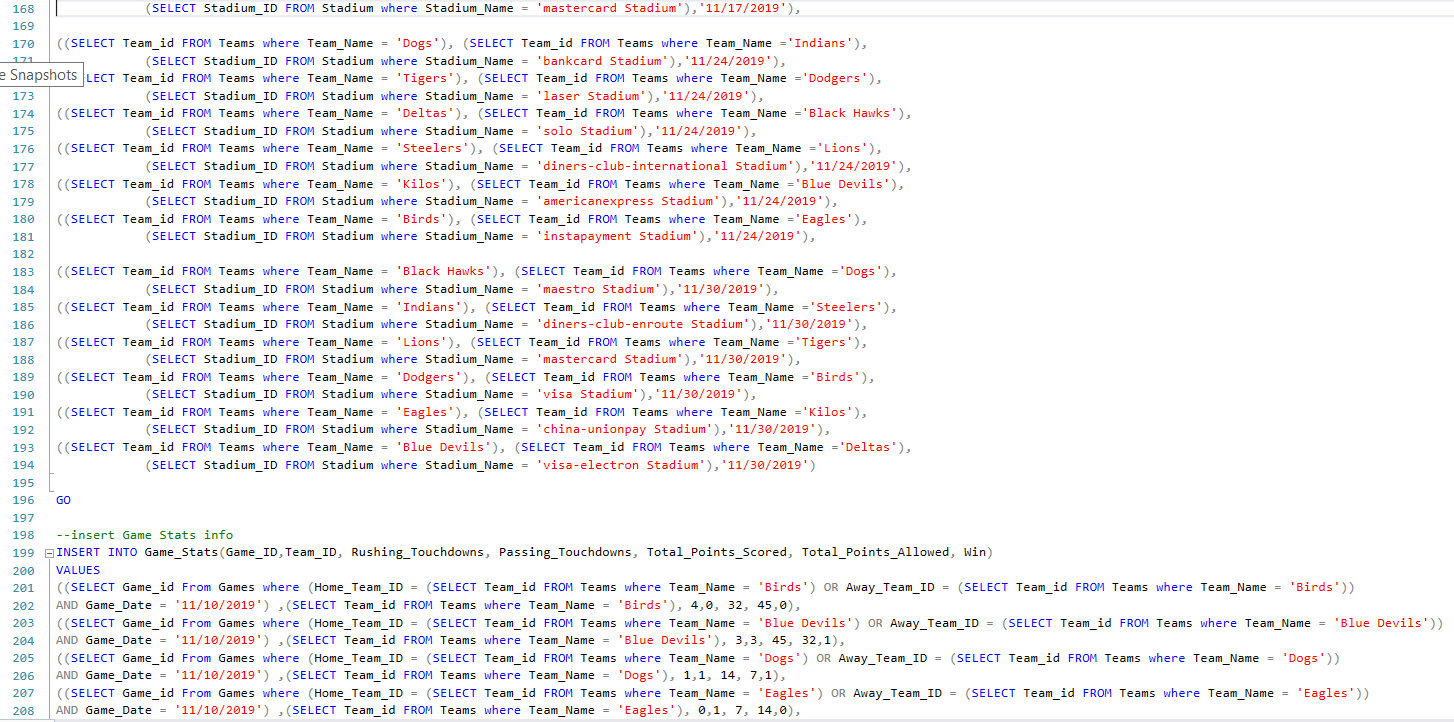


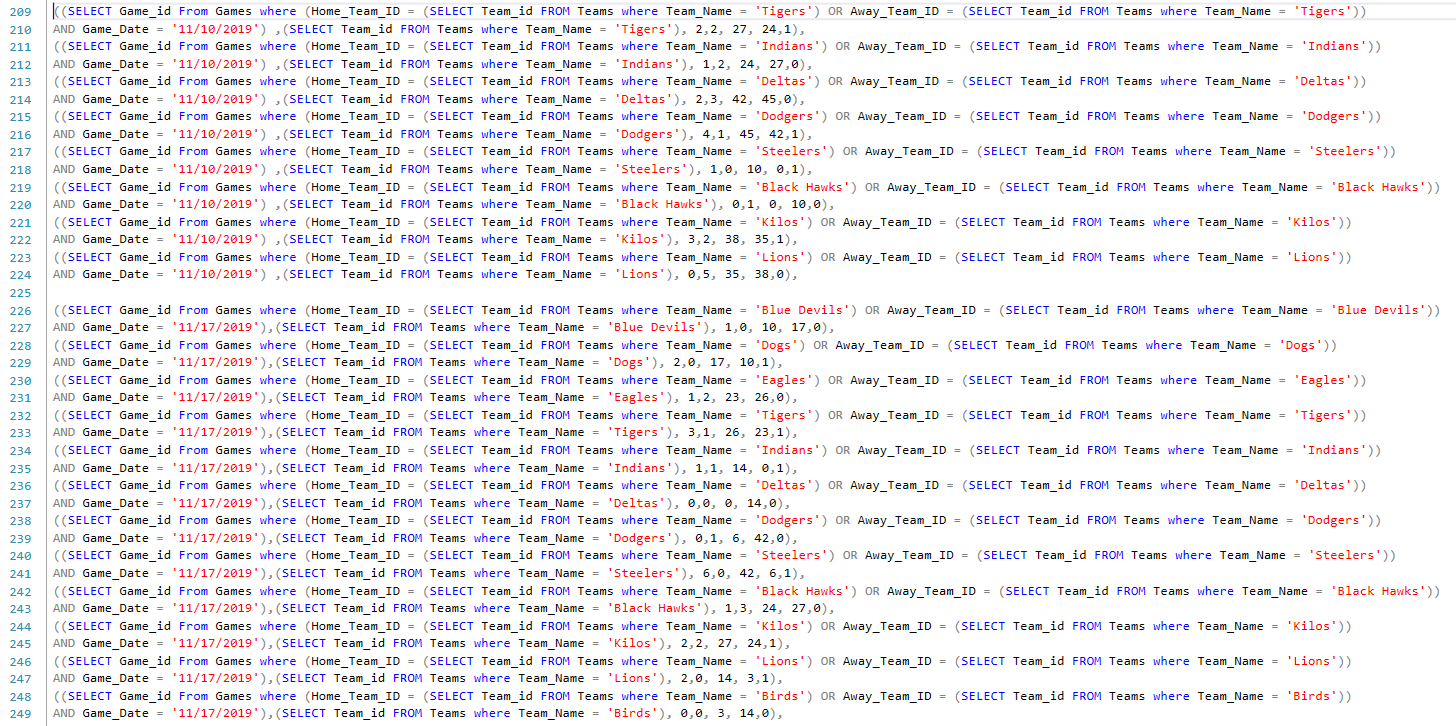


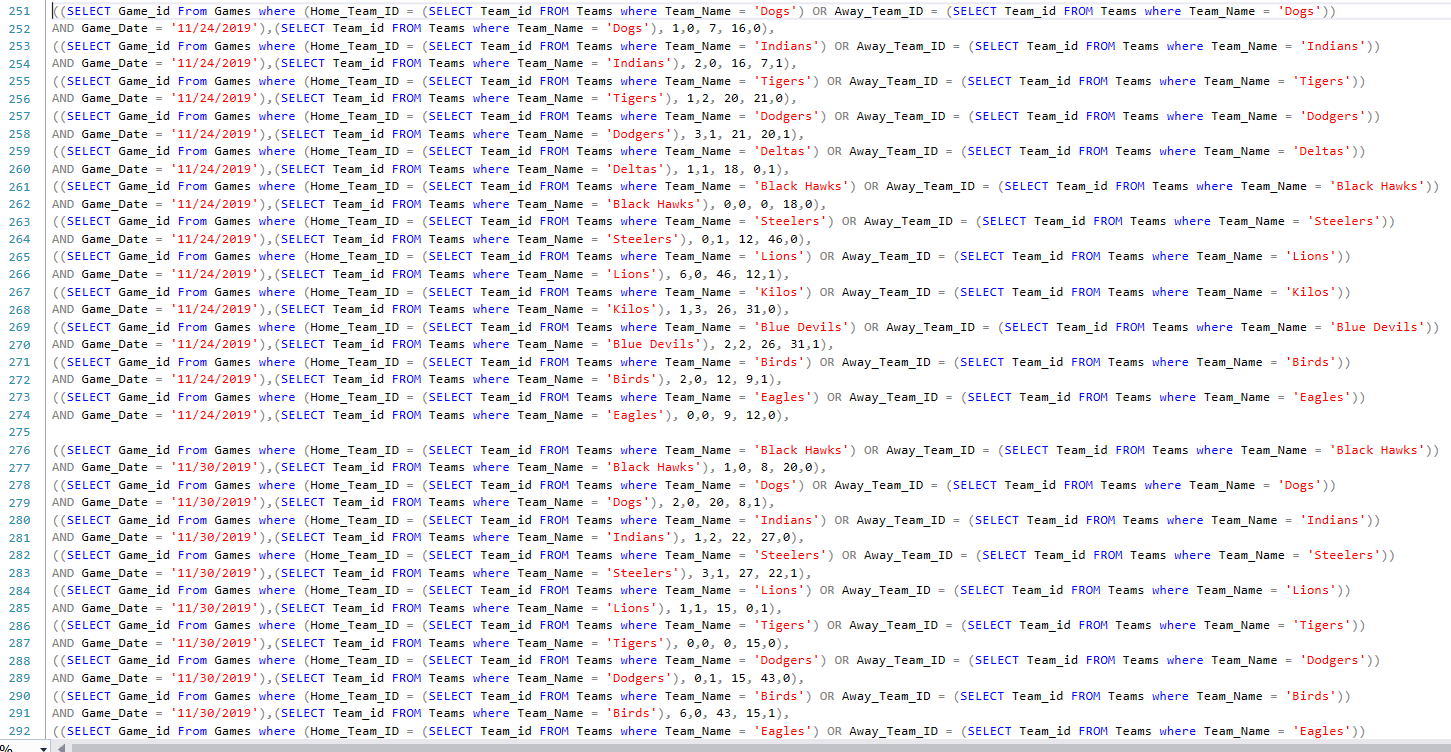


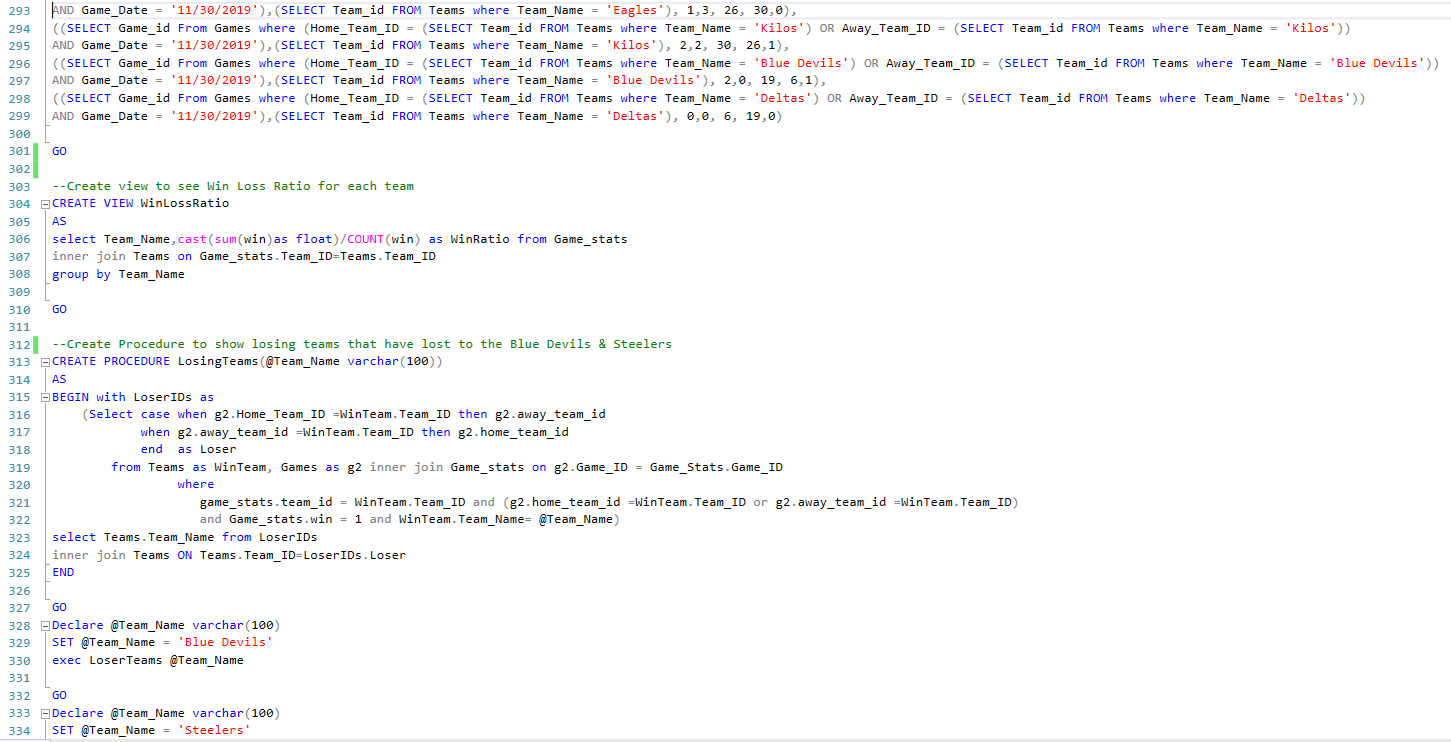


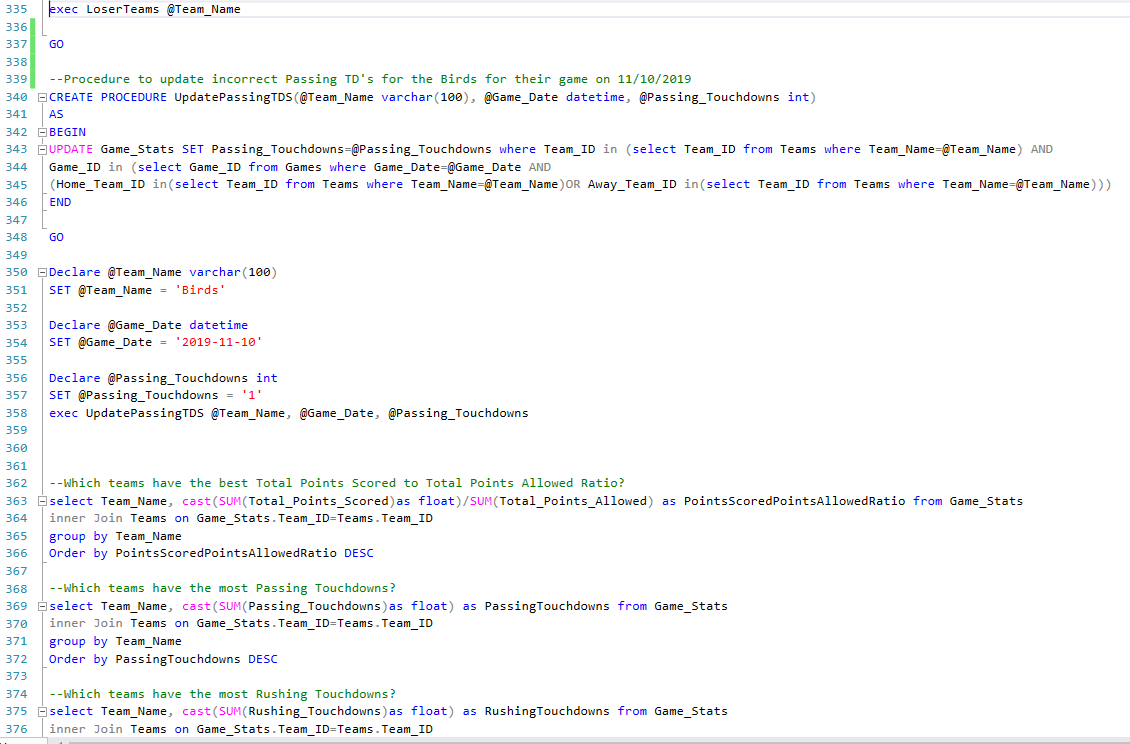


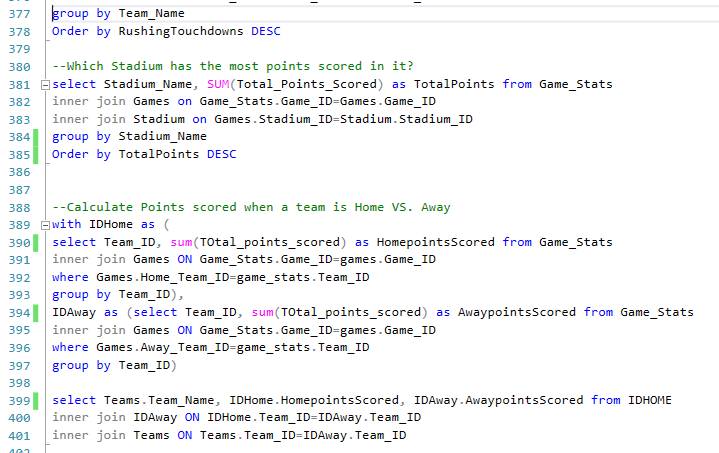












**--Copied from SQL**

--create tables/views/procedures/functions in repeatable form

-- create drops

--drop procedures

IF OBJECT\_ID('dbo.LosingTeams') IS NOT NULL

DROP PROCEDURE dbo.LosingTeams

GO

IF OBJECT\_ID('dbo.UpdatePassingTDS') IS NOT NULL

DROP PROCEDURE UpdatePassingTDS

--drop views

IF OBJECT\_ID('dbo.WinLossRatio') IS NOT NULL

DROP VIEW dbo.WinLossRatio

--drop tables

IF OBJECT\_ID('Game\_Stats') IS NOT NULL

DROP TABLE dbo.Game\_Stats

GO

IF OBJECT\_ID('dbo.Games') IS NOT NULL

DROP TABLE dbo.Games

GO

IF OBJECT\_ID('dbo.Stadium') IS NOT NULL

DROP TABLE dbo.Stadium

GO

IF OBJECT\_ID('dbo.Teams') IS NOT NULL

DROP TABLE dbo.Teams

GO

---------------------------------------------------------------------------------

--create database tables

CREATE TABLE Teams(

--create columns

Team\_ID int identity

, Team\_Name varchar(50) NOT NULL unique

--place constraints

, CONSTRAINT PK\_Team\_ID PRIMARY KEY (Team\_ID)

)

GO

CREATE TABLE Stadium(

--create columns

Stadium\_ID int identity

,Stadium\_Name varchar(50)

--place constraints

, CONSTRAINT PK\_Stadium PRIMARY KEY (Stadium\_ID)

)

GO

CREATE TABLE Games(

--create columns

Game\_ID int identity

, Home\_Team\_ID int

, Away\_Team\_ID int

, Stadium\_ID int

,Game\_Date datetime

--place constraints

, CONSTRAINT PF\_Games Primary KEY(Game\_ID)

, CONSTRAINT FK\_Games FOREIGN KEY(Home\_Team\_ID) REFERENCES Teams(Team\_ID)

, CONSTRAINT FK2\_Games FOREIGN KEY(Away\_Team\_ID) REFERENCES Teams(Team\_ID)

, CONSTRAINT FK3\_Games FOREIGN KEY(Stadium\_ID) REFERENCES Stadium(Stadium\_ID)

)

GO

CREATE TABLE Game\_Stats(

--create columns

Game\_ID int

, Team\_ID int

, Rushing\_Touchdowns int

, Passing\_Touchdowns int

, Total\_Points\_Scored int

, Total\_Points\_Allowed int

, Win int

-- place constraints

, CONSTRAINT PF1\_Games Foreign KEY(Game\_ID) REFERENCES Games(Game\_ID)

, CONSTRAINT FK1\_Teams Foreign KEY(Team\_ID) REFERENCES Teams(Team\_ID)

, CONSTRAINT NonNegativeRushingTD Check (Rushing\_Touchdowns > -1)

, CONSTRAINT NonNegativePassingTD Check (Passing\_Touchdowns > -1)

, CONSTRAINT NonNegativeTotalPtsScored Check (Total\_Points\_Scored > -1)

, CONSTRAINT NonNegativeTotalPtsAllowed Check (Total\_Points\_Allowed > -1)

)

--Select \* from Stadium

--Select \* from Teams

--Select \* from Games

--Select \* from Game\_Stats

GO

--insert Teams into Teams table

INSERT INTO Teams(Team\_Name)

VALUES

('Eagles'),

('Blue Devils'),

('Black Hawks'),

('Dodgers'),

('Dogs'),

('Tigers'),

('Indians'),

('Lions'),

('Kilos'),

('Deltas'),

('Steelers'),

('Birds')

GO

--insert stadium info

INSERT INTO Stadium(Stadium\_Name)

VALUES

('mastercard Stadium'),

('maestro Stadium'),

('visa Stadium'),

('diners-club-enroute Stadium'),

('china-unionpay Stadium'),

('visa-electron Stadium'),

('americanexpress Stadium'),

('diners-club-international Stadium'),

('solo Stadium'),

('laser Stadium'),

('instapayment Stadium'),

('bankcard Stadium')

GO

--insert Game info

INSERT INTO Games(Home\_Team\_ID, Away\_Team\_ID, Stadium\_ID, Game\_Date)

VALUES

((SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), (SELECT Team\_id FROM Teams where Team\_Name ='Blue Devils'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'instapayment Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), (SELECT Team\_id FROM Teams where Team\_Name ='Eagles'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'bankcard Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), (SELECT Team\_id FROM Teams where Team\_Name ='Indians'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'laser Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), (SELECT Team\_id FROM Teams where Team\_Name ='Dodgers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'solo Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), (SELECT Team\_id FROM Teams where Team\_Name ='Black Hawks'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'diners-club-international Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), (SELECT Team\_id FROM Teams where Team\_Name ='Lions'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'americanexpress Stadium'),'11/10/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), (SELECT Team\_id FROM Teams where Team\_Name ='Dogs'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'visa-electron Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), (SELECT Team\_id FROM Teams where Team\_Name ='Tigers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'china-unionpay Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), (SELECT Team\_id FROM Teams where Team\_Name ='Deltas'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'diners-club-enroute Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), (SELECT Team\_id FROM Teams where Team\_Name ='Steelers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'visa Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), (SELECT Team\_id FROM Teams where Team\_Name ='Kilos'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'maestro Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), (SELECT Team\_id FROM Teams where Team\_Name ='Birds'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'mastercard Stadium'),'11/17/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), (SELECT Team\_id FROM Teams where Team\_Name ='Indians'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'bankcard Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), (SELECT Team\_id FROM Teams where Team\_Name ='Dodgers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'laser Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), (SELECT Team\_id FROM Teams where Team\_Name ='Black Hawks'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'solo Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), (SELECT Team\_id FROM Teams where Team\_Name ='Lions'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'diners-club-international Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), (SELECT Team\_id FROM Teams where Team\_Name ='Blue Devils'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'americanexpress Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), (SELECT Team\_id FROM Teams where Team\_Name ='Eagles'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'instapayment Stadium'),'11/24/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), (SELECT Team\_id FROM Teams where Team\_Name ='Dogs'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'maestro Stadium'),'11/30/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), (SELECT Team\_id FROM Teams where Team\_Name ='Steelers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'diners-club-enroute Stadium'),'11/30/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), (SELECT Team\_id FROM Teams where Team\_Name ='Tigers'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'mastercard Stadium'),'11/30/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), (SELECT Team\_id FROM Teams where Team\_Name ='Birds'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'visa Stadium'),'11/30/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), (SELECT Team\_id FROM Teams where Team\_Name ='Kilos'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'china-unionpay Stadium'),'11/30/2019'),

((SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), (SELECT Team\_id FROM Teams where Team\_Name ='Deltas'),

(SELECT Stadium\_ID FROM Stadium where Stadium\_Name = 'visa-electron Stadium'),'11/30/2019')

GO

--insert Game Stats info

INSERT INTO Game\_Stats(Game\_ID,Team\_ID, Rushing\_Touchdowns, Passing\_Touchdowns, Total\_Points\_Scored, Total\_Points\_Allowed, Win)

VALUES

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), 4,0, 32, 45,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), 3,3, 45, 32,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), 1,1, 14, 7,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), 0,1, 7, 14,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), 2,2, 27, 24,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), 1,2, 24, 27,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), 2,3, 42, 45,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), 4,1, 45, 42,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), 1,0, 10, 0,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), 0,1, 0, 10,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), 3,2, 38, 35,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions'))

AND Game\_Date = '11/10/2019') ,(SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), 0,5, 35, 38,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), 1,0, 10, 17,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), 2,0, 17, 10,1),

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AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), 1,2, 23, 26,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), 3,1, 26, 23,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), 1,1, 14, 0,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), 0,0, 0, 14,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), 0,1, 6, 42,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), 6,0, 42, 6,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), 1,3, 24, 27,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), 2,2, 27, 24,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), 2,0, 14, 3,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds'))

AND Game\_Date = '11/17/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), 0,0, 3, 14,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), 1,0, 7, 16,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), 2,0, 16, 7,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), 1,2, 20, 21,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), 3,1, 21, 20,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), 1,1, 18, 0,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), 0,0, 0, 18,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), 0,1, 12, 46,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), 6,0, 46, 12,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), 1,3, 26, 31,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), 2,2, 26, 31,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), 2,0, 12, 9,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'))

AND Game\_Date = '11/24/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), 0,0, 9, 12,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Black Hawks'), 1,0, 8, 20,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dogs'), 2,0, 20, 8,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Indians'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Indians'), 1,2, 22, 27,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Steelers'), 3,1, 27, 22,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Lions'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Lions'), 1,1, 15, 0,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Tigers'), 0,0, 0, 15,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Dodgers'), 0,1, 15, 43,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Birds'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Birds'), 6,0, 43, 15,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Eagles'), 1,3, 26, 30,0),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Kilos'), 2,2, 30, 26,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Blue Devils'), 2,0, 19, 6,1),

((SELECT Game\_id From Games where (Home\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas') OR Away\_Team\_ID = (SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'))

AND Game\_Date = '11/30/2019'),(SELECT Team\_id FROM Teams where Team\_Name = 'Deltas'), 0,0, 6, 19,0)

GO

--Create view to see Win Loss Ratio for each team

CREATE VIEW WinLossRatio

AS

select Team\_Name,cast(sum(win)as float)/COUNT(win) as WinRatio from Game\_stats

inner join Teams on Game\_stats.Team\_ID=Teams.Team\_ID

group by Team\_Name

GO

--Create Procedure to show losing teams that have lost to the Blue Devils & Steelers

CREATE PROCEDURE LosingTeams(@Team\_Name varchar(100))

AS

BEGIN with LoserIDs as

(Select case when g2.Home\_Team\_ID =WinTeam.Team\_ID then g2.away\_team\_id

when g2.away\_team\_id =WinTeam.Team\_ID then g2.home\_team\_id

end as Loser

from Teams as WinTeam, Games as g2 inner join Game\_stats on g2.Game\_ID = Game\_Stats.Game\_ID

where

game\_stats.team\_id = WinTeam.Team\_ID and (g2.home\_team\_id =WinTeam.Team\_ID or g2.away\_team\_id =WinTeam.Team\_ID)

and Game\_stats.win = 1 and WinTeam.Team\_Name= @Team\_Name)

select Teams.Team\_Name from LoserIDs

inner join Teams ON Teams.Team\_ID=LoserIDs.Loser

END

GO

Declare @Team\_Name varchar(100)

SET @Team\_Name = 'Blue Devils'

exec LoserTeams @Team\_Name

GO

Declare @Team\_Name varchar(100)

SET @Team\_Name = 'Steelers'

exec LoserTeams @Team\_Name

GO

--Procedure to update incorrect Passing TD's for the Birds for their game on 11/10/2019

CREATE PROCEDURE UpdatePassingTDS(@Team\_Name varchar(100), @Game\_Date datetime, @Passing\_Touchdowns int)

AS

BEGIN

UPDATE Game\_Stats SET Passing\_Touchdowns=@Passing\_Touchdowns where Team\_ID in (select Team\_ID from Teams where Team\_Name=@Team\_Name) AND

Game\_ID in (select Game\_ID from Games where Game\_Date=@Game\_Date AND

(Home\_Team\_ID in(select Team\_ID from Teams where Team\_Name=@Team\_Name)OR Away\_Team\_ID in(select Team\_ID from Teams where Team\_Name=@Team\_Name)))

END

GO

Declare @Team\_Name varchar(100)

SET @Team\_Name = 'Birds'

Declare @Game\_Date datetime

SET @Game\_Date = '2019-11-10'

Declare @Passing\_Touchdowns int

SET @Passing\_Touchdowns = '1'

exec UpdatePassingTDS @Team\_Name, @Game\_Date, @Passing\_Touchdowns

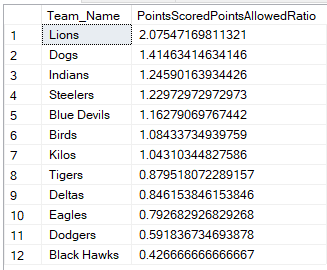
**--Which teams have the best Total Points Scored to Total Points Allowed Ratio?**

select Team\_Name, cast(SUM(Total\_Points\_Scored)as float)/SUM(Total\_Points\_Allowed) as PointsScoredPointsAllowedRatio from Game\_Stats

inner Join Teams on Game\_Stats.Team\_ID=Teams.Team\_ID

group by Team\_Name

Order by PointsScoredPointsAllowedRatio DESC



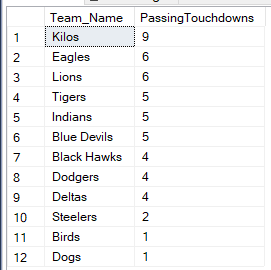
**--Which teams have the most Passing Touchdowns?**

select Team\_Name, cast(SUM(Passing\_Touchdowns)as float) as PassingTouchdowns from Game\_Stats

inner Join Teams on Game\_Stats.Team\_ID=Teams.Team\_ID

group by Team\_Name

Order by PassingTouchdowns DESC



**--Which teams have the most Rushing Touchdowns?**

select Team\_Name, cast(SUM(Rushing\_Touchdowns)as float) as RushingTouchdowns from Game\_Stats

inner Join Teams on Game\_Stats.Team\_ID=Teams.Team\_ID

group by Team\_Name

Order by RushingTouchdowns DESC



**--Which Stadium has the most points scored in it?**

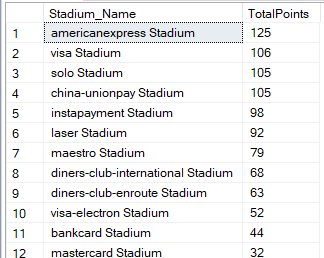
select Stadium\_Name, SUM(Total\_Points\_Scored) as TotalPoints from Game\_Stats

inner join Games on Game\_Stats.Game\_ID=Games.Game\_ID

inner join Stadium on Games.Stadium\_ID=Stadium.Stadium\_ID

group by Stadium\_Name

Order by TotalPoints DESC



**--Calculate Points scored when a team is Home VS. Away**

with IDHome as (

select Team\_ID, sum(TOtal\_points\_scored) as HomepointsScored from Game\_Stats

inner join Games ON Game\_Stats.Game\_ID=games.Game\_ID

where Games.Home\_Team\_ID=game\_stats.Team\_ID

group by Team\_ID),

IDAway as (select Team\_ID, sum(TOtal\_points\_scored) as AwaypointsScored from Game\_Stats

inner join Games ON Game\_Stats.Game\_ID=games.Game\_ID

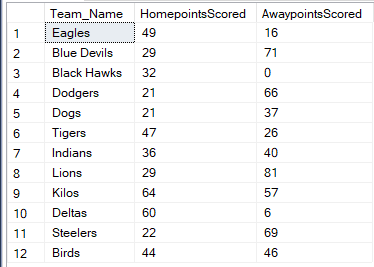
where Games.Away\_Team\_ID=game\_stats.Team\_ID

group by Team\_ID)

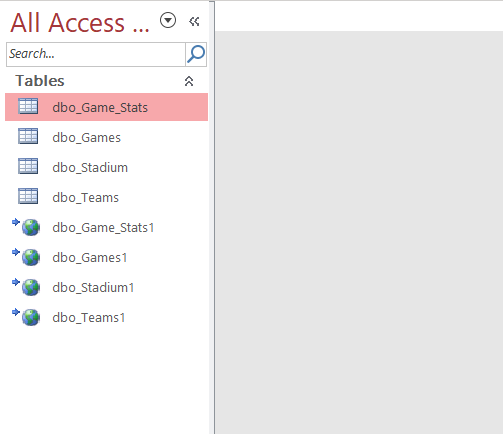
select Teams.Team\_Name, IDHome.HomepointsScored, IDAway.AwaypointsScored from IDHOME

inner join IDAway ON IDHome.Team\_ID=IDAway.Team\_ID

inner join Teams ON Teams.Team\_ID=IDAway.Team\_ID



Linking my data to Access from SQL



**Reflection**

At first, the Conceptual and Logical models were a struggle for me. My experience in SQL began by being thrown into coding without the background of Conceptual and Logical Models. I learned querying and data manipulation by trial and error without the necessary background needed. As the course progressed, modeling the tables and actually planning and thinking about organization became apparent to me how important it is. I think more time learning how to link SQL with Access and R would have been very beneficial. More time on these subjects would have allowed me to utilize more analysis tools. If I had another shot at this, I would have made my queries more efficient, as I realize many of mine are not written in the most efficient fashion. Again, more time learning about connections between SQL with Access and R would have been very beneficial.

**Summary**

Starting with the Conceptual and Logical modeling techniques was difficult for me in the beginning. As I mentioned before, I have had experience writing queries to extract and analyze data but as far as planning and organizing a database, I had not been accustomed to that. It provided me with a new perspective on how databases work and how efficiency is key to create a successful one. I was able to answer a majority of my questions through SQL queries, while also being able to create a few graphs in R. I am not a big fan of Access and would much rather use R to produce report outputs, as they are much more visually pleasing. I enjoyed working through this project learning how SQL, Access and R, as well as other languages, can vibe together and can be extremely beneficial in organizing and analyzing data.