



SCRAPING THE WEB FOR ALL NFL PASS,
RUN & FIELD GOAL DATA

1998 - PRESENT

ALEX, RYAN, FELIPE × 2

OBJECTIVE

- Analyse passes, runs, field goal information
- Look for trends in types of play / pass over time
- Scrape NFL play data from multiple sources
- Combine in relational database for analysis



DATA



FIELD GOALS

- Kicker
- Distance
- Successful?

PASS PLAY

- Passer
- Receiver
- Successful?
- Distance

RUN PLAY

- Runner
- Tackler
- Distance



TOOLS

- WGET
- Python & BeautifulSoup
- Amazon Web Services postgreSQL server
- R & ggplot2



ACQUISITION

- Scrape information plays from [pro-football-reference.com](#)
 - 290,945 passes
 - 241,372 runs
 - 4942 field goals
 - 5773 players
 - 4312 games
- Pull date, time, score, venue information from [nfl.com](#)



SOURCES

SUNDAY, SEPTEMBER 13TH

Individual Plays								
Date	Tm	Opp	Quarter	Time	Down	ToGo	Locat	Play
2012-09-09	49ers	Packers	2	0:18	1	10	SFO 3	Run, 1st down, 10 yards to go, SFO 3
2012-09-09	49ers	Packers	3	2:51	2	15	SFO 1	Pass, 2nd down, 15 yards to go, SFO 1
2012-09-09	49ers	Packers	2	4:40	1	10	SFO 2	Run, 1st down, 10 yards to go, SFO 2
2012-09-09	49ers	Packers	2	4:40	1	10	SFO 3	Pass, 1st down, 10 yards to go, SFO 3
2012-09-09	49ers	Packers	2	2:00	2	7	GNB 4	Run, 2nd down, 7 yards to go, GNB 4
2012-09-09	49ers	Packers	2	1:50	2	10	GNB 3	Pass, 2nd down, 10 yards to go, GNB 3
2012-09-09	49ers	Packers	3	4:36	1	10	SFO 4	Run, 1st down, 10 yards to go, SFO 4
2012-09-09	49ers	Packers	1	1:20	1	10	SFO 8	Pass, 1st down, 10 yards to go, SFO 8
2012-09-09	49ers	Packers	2	3:27	1	10	SFO 4	Run, 1st down, 10 yards to go, SFO 4
2012-09-09	49ers	Packers	3	2:28	1	10	SFO 2	Pass, 1st down, 10 yards to go, SFO 2
2012-09-09	49ers	Packers	4	3:56	3	17	SFO 3	Run, 3rd down, 17 yards to go, SFO 3
2012-09-09	49ers	Packers	3	4:10	2	3	SFO 1	Pass, 2nd down, 3 yards to go, SFO 1
2012-09-09	49ers	Packers	2	2:43	1	10	GNB 4	Run, 1st down, 10 yards to go, GNB 4
2012-09-09	49ers	Packers	3	1:37	3	5	SFO 3	Pass, 3rd down, 5 yards to go, SFO 3
2012-09-09	49ers	Packers	1	0:35	2	5	SFO 1	Run, 1st down, 5 yards to go, SFO 1
2012-09-09	49ers	Packers	2	1:05	3	1	GNB 2	Pass, 2nd down, 1 yard to go, GNB 2
2012-09-09	49ers	Packers	4	4:46	1	10	SFO 4	Run, 1st down, 10 yards to go, SFO 4
2012-09-09	49ers	Packers	4	0:49	1	10	SFO 4	Pass, 1st down, 10 yards to go, SFO 4
2012-09-09	49ers	Packers	4	0:26	2	11	SFO 4	Run, 2nd down, 11 yards to go, SFO 4
2012-09-09	49ers	Packers	3	3:28	1	10	SFO 1	Pass, 1st down, 10 yards to go, SFO 1
2012-09-09	49ers	Packers	4	4:01	2	10	SFO 4	Run, 2nd down, 10 yards to go, SFO 4
2012-09-09	49ers	Packers	2	2:52	2	5	SFO 4	Pass, 2nd down, 5 yards to go, SFO 4
2012-09-09	49ers	Packers	2	1:55	1	10	GNB 3	Run, 1st down, 10 yards to go, GNB 3
2012-09-09	49ers	Packers	2	0:11	1	10	GNB 4	Pass, 1st down, 10 yards to go, GNB 4
2012-09-09	49ers	Packers	2	0:06	2	10	GNB 4	Run, 2nd down, 10 yards to go, GNB 4
2012-09-09	49ers	Packers	3	1:43	2	5	SFO 3	Pass, 2nd down, 5 yards to go, SFO 3

Final Scores								
Game	Team	Score	Team	Score	Game Center			
FINAL	PACKERS	31	Bears	23	GAME CENTER			
FINAL	CHIEFS	27	TEXANS	20	GAME CENTER			
FINAL	BROWNS	10	JETS	31	GAME CENTER			
FINAL	COLTS	14	BILLS	27	GAME CENTER			
FINAL	DOLPHINS	17	REDSKINS	10	GAME CENTER			
FINAL	PANTHERS	20	JAGUARS	9	GAME CENTER			
FINAL	SEAHAWKS	31	RAMS	34	GAME CENTER			
FINAL	SAINTS	19	CARDINALS	31	GAME CENTER			
FINAL	LIONS	28	CHARGERS	33	GAME CENTER			
FINAL	TITANS	42	BUCANEERS	14	GAME CENTER			
FINAL	BENGALS	33	RAIDERS	13	GAME CENTER			
FINAL	RAVENS	13	BRONCOS	19	GAME CENTER			
FINAL	GIANTS	26	COWBOYS	27	GAME CENTER			



STRUCTURE

SCHEDULE				
GAME_ID	DATE	HOME_TEAM	AWAY_TEAM	OTHER_VARS

GAME_ID

GAME_ID

GAME_ID

PASSES			
DATE	OFF_TEAM	DEF_TEAM	OTHER_VARS

RUSHES			
DATE	OFF_TEAM	DEF_TEAM	OTHER_VARS

FIELD GOALS			
DATE	OFF_TEAM	DEF_TEAM	OTHER_VARS



FINDINGS

Most prolific passers since 1998

```
SELECT passer, COUNT(passer) AS Attempts, SUM(yards)
AS Yards FROM nfl.passes WHERE Completed = TRUE
GROUP BY passer ORDER BY Attempts DESC
```

Passer	Attempts	Yards
Peyton Manning	5994	70240
Drew Brees	5029	56603
Tom Brady	4623	54018
Brett Favre	4431	49999
Eli Manning	3377	40314
Ben Roethlisberger	3275	39947
Donovan McNabb	3254	38039
Carson Palmer	3137	36076
Matt Hasselbeck	3103	35259
Philip Rivers	3087	37289



FINDINGS

Most prolific runners since 1998

```
SELECT runner, COUNT(runner) AS Attempts, SUM(yards)
AS yards FROM nfl.runs WHERE Yards > 0
GROUP BY runner ORDER BY yards DESC
```

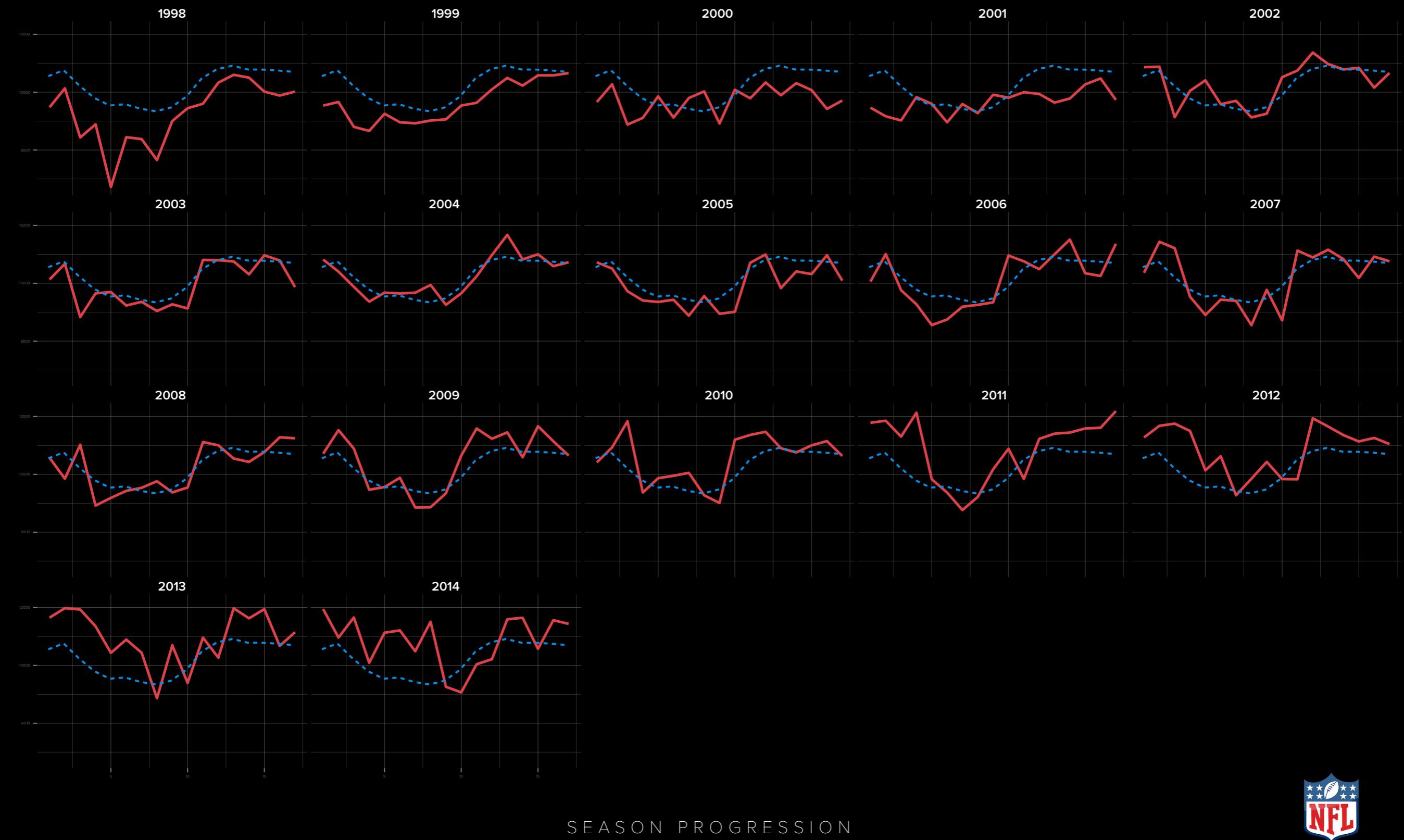
Runner	Attempts	Yards
LaDainian Tomlinson	2653	14776
Edgerrin James	2514	13005
Fred Taylor	2051	12271
Steven Jackson	2190	12058
Adrian Peterson	1873	12044
Frank Gore	1995	11601
Thomas Jones	2255	11311
Jamal Lewis	2174	11230
Curtis Martin	2094	10957
Corey Dillon	1888	10839



AVERAGE YARDS PER SEASON



YARDS PER WEEK BY SEASON



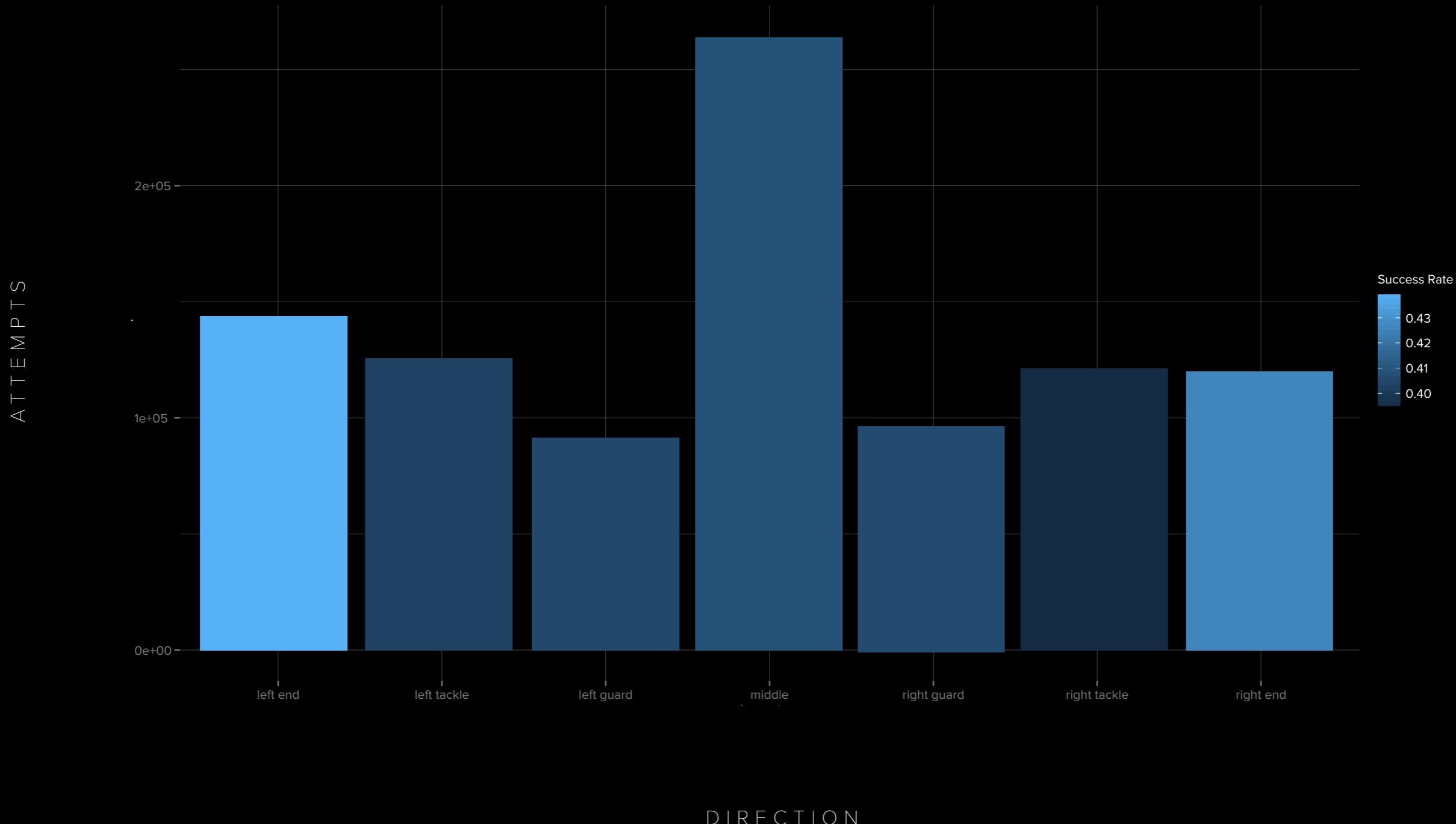
OFFENSIVE VS DEFENSIVE YARDS

For the 2014/15 season



RUSH SUCCESS RATE BY DIRECTION

For the all seasons since 1998



Q & A

