

Analysis of Fantasy Football

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Purpose

This project was created to examine NFL statistics over the past 10 years and see how they relate to fantasy football. This project also seeks to discover how different position scoring has changed over time. These relationships and changes in NFL statistics were displayed using data visualization techniques.

Results

Scatterplots were made for each position to determine the relationship between yards, touchdowns, and fantasy points. Another Scatterplot was created to show the changes in fantasy football scoring over the past 10 years.

Process

Data was gathered from ESPN.com using web scrapping (extracting data from web sites, and converting it into a useable format) with R (a programming language used for statistics). 10 years of NFL statistics were gathered and divided into 4 data tables based on player's NFL positions: quarterback, running back, wide receiver, and tight end.

```
1 library("rvest")
2 library(ggplot2)
3 library(stringr)
4
5 # Take an HTML table from ESPN player stats, get the data.
6 getHTMLTable <- function(columns, url)
7 {
8   webpage <- read_html(url)
9   values <- html_table(webpage)
10  table <- data.frame(matrix(unlist(values), ncol=columns, byrow=F))
11  colnames(table) <- lapply(table[1, ], as.character)
12  table <- unique(table)
13  table <- table[,1:]
14
15  return(table)
16
17 # makes the 1st column display the year
18 addYear <- function(table, year)
19 {
20   table[,1] <- year
21   colnames(table)[1] <- "Year"
22   return(table)
23 }
24
25 # Creates and combines tables from the last 10 years
26 multiYearTable <- function(type)
27 {
28   for(i in 1:10)
29   {
30     year <- 2007+i
31     tempTable <- makeTable(type, year)
32     tempTable <- addYear(tempTable, year)
33     if (i == 1)
34       tableCombined <- tempTable
35     else
36       tableCombined <- rbind(tableCombined, tempTable)
37   }
38
39   return(tableCombined)
```

Sample of R Code used:

rvest package was used to gather information from espn.com. ggplot2 package was used to create visuals

Web scraping with R

www.espn.com/nfl/statistics/player/_/stat/

NFL Player Rushing Statistics - 2017

Statistics: Passing | Rushing | Receiving | Scoring | Returning | Blocking | Punting | Defense

Source: 2017 Regular Season

League: NFL

Rushing Yards Leaders - All Players

RK	PLAYER	TEAM	ATT	YDS	YDS/A	LONG	TD	TD	YDS/RT	FUM	INT
1	Kareem Hunt, RB	KC	272	1,527	4.9	69	12	8	82.9	1	60
2	Todd Gurley, RB	LAR	279	1,305	4.7	57	8	13	87.0	5	66
3	Le'Veon Bell, RB	PIT	321	1,291	4.0	27	3	9	86.1	2	78
4	LeSean McCoy, RB	BUF	287	1,126	4.0	48	12	4	71.1	3	90
5	Mark Ingram, RB	NO	230	1,114	4.9	72	11	12	70.3	2	50
6	Jordan Howard, RB	CHI	276	1,102	4.1	53	5	9	70.1	1	61
7	Melvin Gordon, RB	LAC	284	1,105	3.9	87	5	8	69.1	1	58
8	Leonard Fournette, RB	JAX	268	1,040	3.9	90	4	9	80.0	2	46
9	C.J. Anderson, RB	DEN	245	1,007	4.1	60	7	3	62.9	1	47
10	Ezekiel Elliott, RB	DAL	242	983	4.1	30	5	7	98.3	1	55
11	Alex Collins, RB	BAL	212	973	4.6	50	6	6	64.9	2	51
12	Frank Gore, RB	IND	261	961	3.7	21	1	3	50.1	3	49
13	Carlos Hyde, RB	SP	240	940	3.9	61	6	8	58.8	2	44

http://www.espn.com/nfl/statistics/player/_/stat/

Webpage:

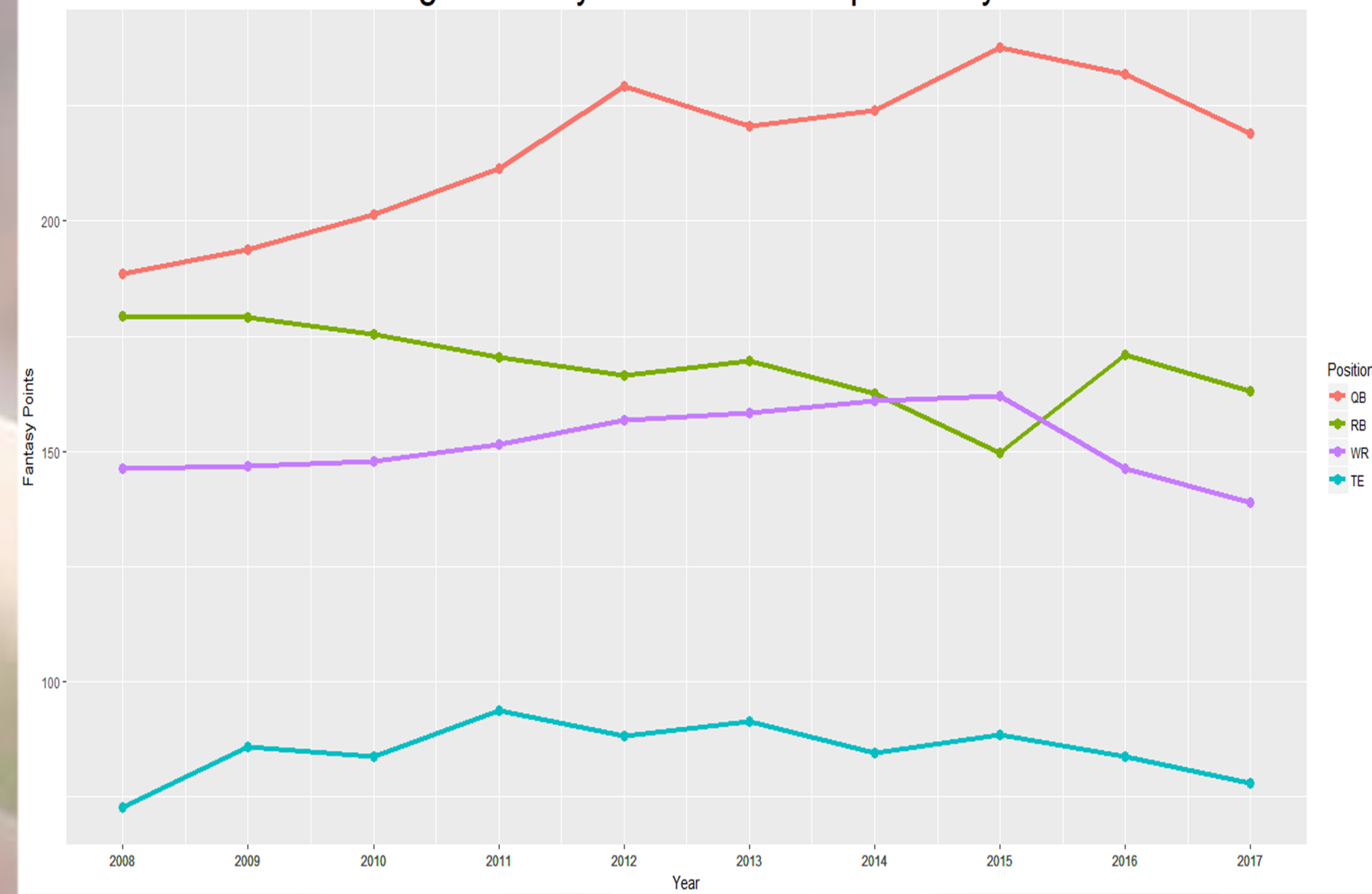
Passing, rushing, and receiving statistics were gathered from 2008-2017

Convert webpage to data table

WebScraping2.R												
Year												
Year	PLAYER	Position	TEAM	ATT	YDS	YDS/A	LONG	TD	YDS/RT	FUM	INT	
2008	2007	Kareem Hunt	RB	KC	272	1527	4.9	69	12	8	82.9	1
2009	2007	Todd Gurley	RB	LAR	279	1305	4.7	57	8	13	87.0	5
2010	2007	Kareem Hunt	RB	KC	321	1291	4.0	27	3	9	86.1	2
2011	2007	LeSean McCoy	RB	BUF	287	1126	4.0	48	12	4	71.1	3
2012	2007	Mark Ingram	RB	NO	230	1114	4.9	72	11	12	70.3	2
2013	2007	Jordan Howard	RB	CHI	276	1102	4.1	53	5	9	70.1	1
2014	2007	Melvin Gordon	RB	LAC	284	1105	3.9	87	5	8	69.1	1
2015	2007	Leonard Fournette	RB	JAX	268	1040	3.9	90	4	9	80.0	2
2016	2007	C.J. Anderson	RB	DEN	245	1007	4.1	60	7	3	62.9	1
2017	2007	Ezekiel Elliott	RB	DAL	242	983	4.1	30	5	7	98.3	1
2018	2007	Alex Collins	RB	BAL	212	973	4.6	50	6	6	64.9	2
2019	2007	Frank Gore	RB	IND	261	961	3.7	21	1	3	50.1	3
2020	2007	Carlos Hyde	RB	SP	240	940	3.9	61	6	8	58.8	2
2021	2007	Christian McCaffrey	RB	SEA	246	940	4.0	47	6	7	94.0	1
1999	2007	Marshall Lynch	RB	OKC	207	891	4.3	51	5	5	59.1	4
2000	2007	LaVar Moore	RB	IND	238	888	3.7	21	1	3	53.5	1
2001	2007	Clinton Portis	RB	CHI	230	888	3.9	30	3	3	54.4	4
2002	2007	Isiah Crowder	RB	CLT	216	853	3.9	31	3	2	51.3	1
2003	2007	LaMar Morris	RB	MIN	216	842	3.9	46	7	8	52.6	1
2004	2007	Clinton Portis	RB	CHI	216	842	3.9	46	7	8	52.6	1
2005	2007	LaMar Morris	RB	MIN	216	842	3.9	46	7	8	52.6	1
2006	2007	Clinton Portis	RB	CHI	216	842	3.9	46	7	8	52.6	1
2007	2007	Clinton Portis	RB	CHI	216	842	3.9	46	7	8	52.6	1
2008	2007	Clinton Portis	RB	CHI	216	842	3.9	46	7	8	52.6	1
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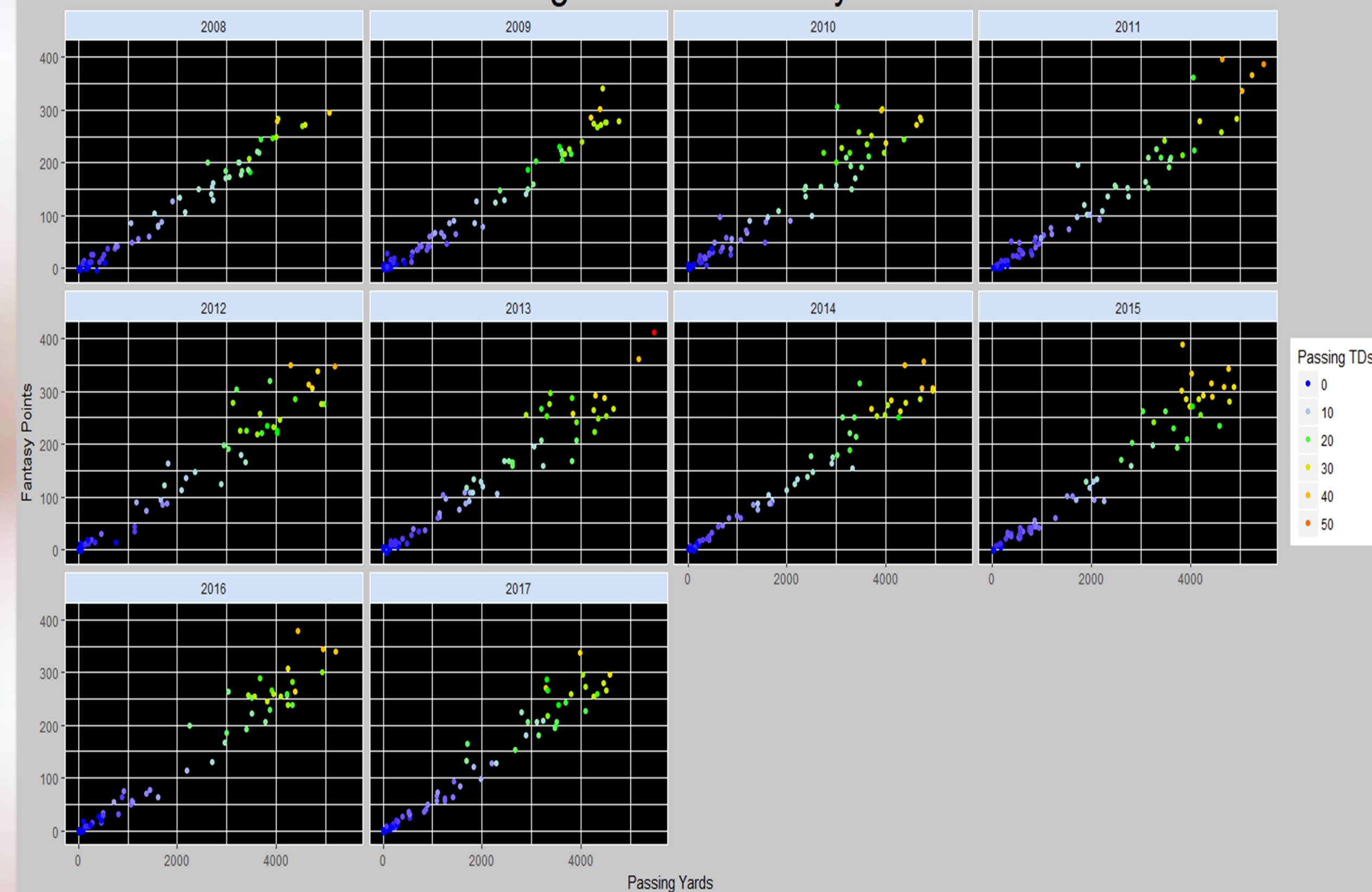
Data from the espn.com was gathered into a data table in R. Data was then cleaned up into a more useable format.

Average Fantasy Points of the Top 32 Players



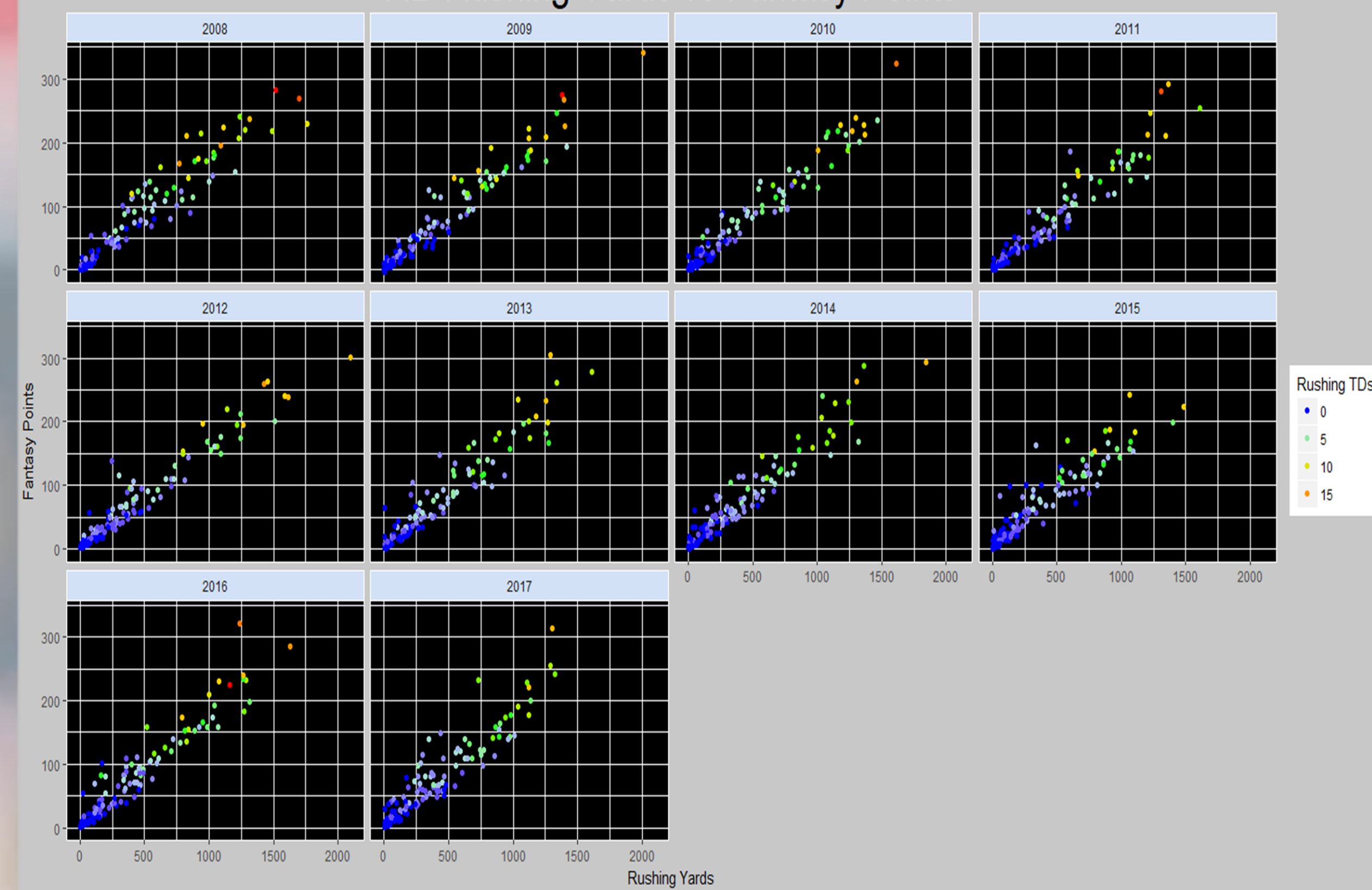
Scatterplot showing changes in fantasy football scoring over the past 10 years.

QB Passing Yards vs Fantasy Points



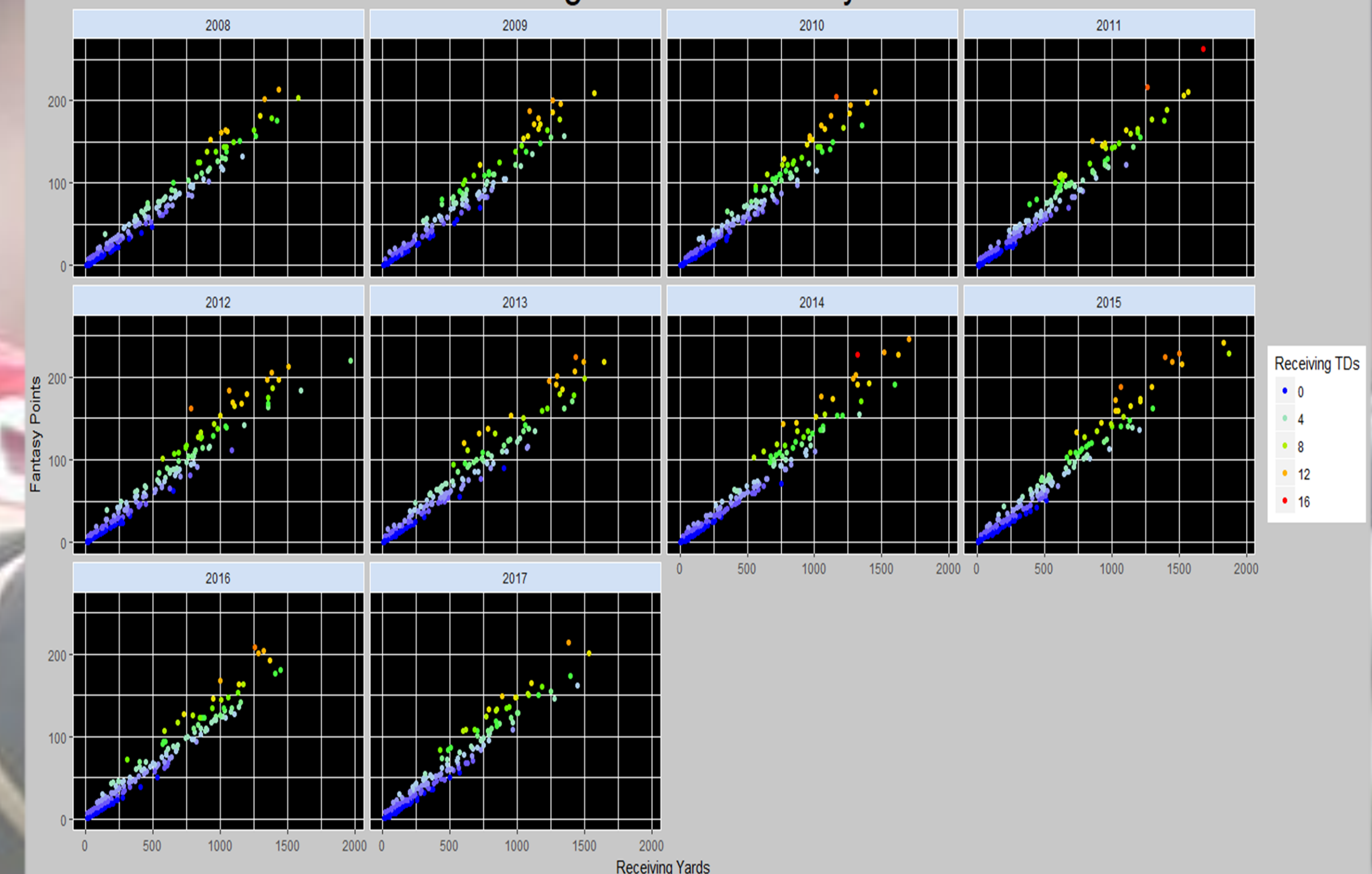
Quarterback scatterplot of passing yards vs fantasy points for the past 10 years. The points are colored based on passing touchdowns.

RB Rushing Yards vs Fantasy Points



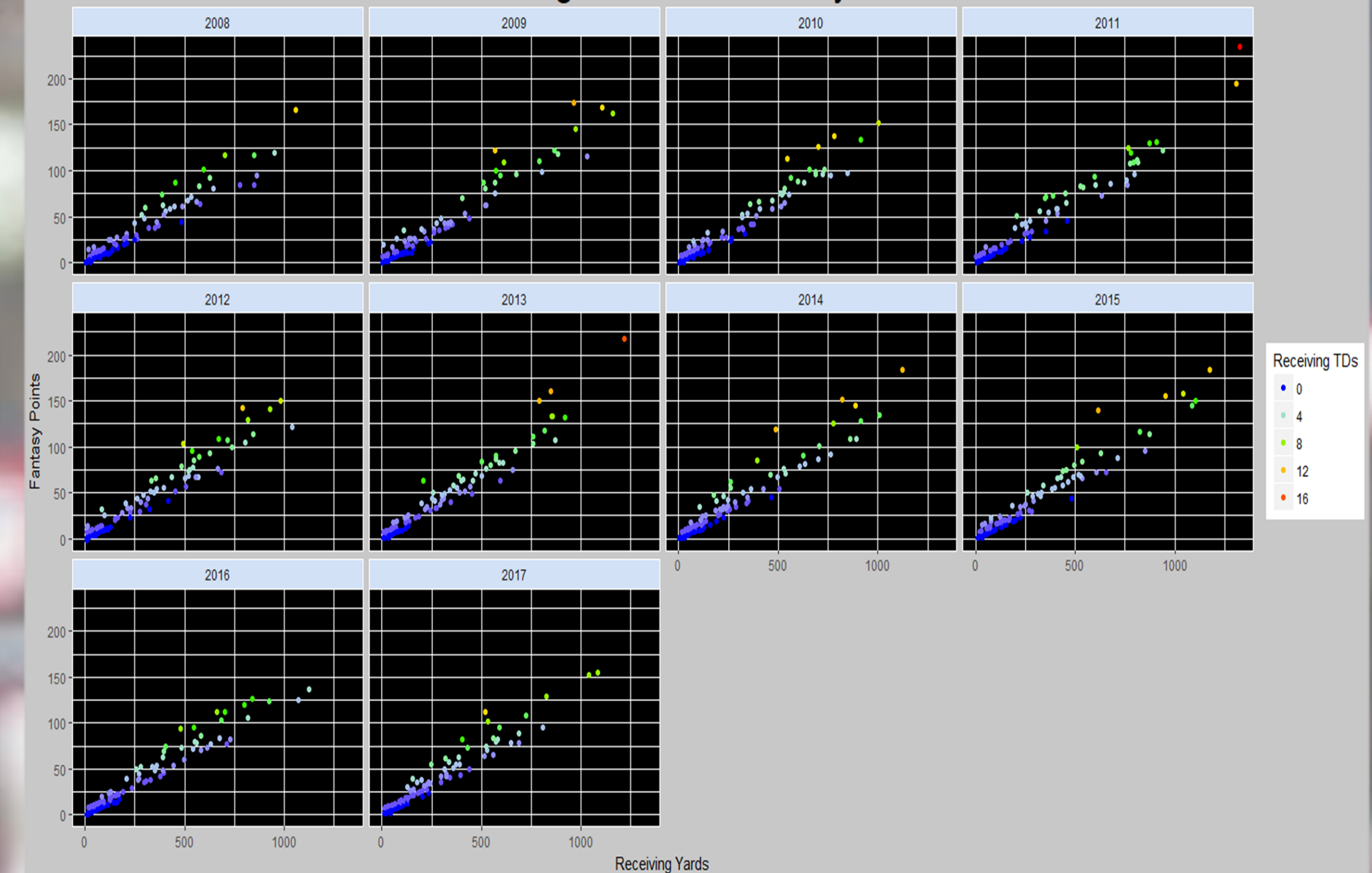
Running back scatterplot of rushing yards vs fantasy points for the past 10 years. The points are colored based on rushing touchdowns.

WR Receiving Yards vs Fantasy Points



Wide receiver scatterplot of receiving yards vs fantasy points for the past 10 years. The points are colored based on receiving touchdowns.

TE Receiving Yards vs Fantasy Points



Tight end scatterplot of receiving yards vs fantasy points for the past 10 years. The points are colored based on receiving touchdowns.

Conclusion

The NFL has become more of a passing league over the past decade, and this trend is evident in these graphs. Quarterback and wide receiver points generally increased, and running back points generally decreased from 2008 to 2016. The past two years (2016 and 2017) show that the NFL might be becoming more focused on rushing, as quarterback and wide receiver points were lower, while running back points were higher. These graphs also show that quarterback and running back points seem to have an inverse relationship.

Each position showed a strong relationship between yards and fantasy points. Running backs had the weakest relationship between yards and fantasy points, likely because running backs are reliant on both rushing and receiving. The tight end position had a few players greatly outperform their peers. In 2011 and 2013 there is a noticeable gap between the best tight ends and the others.