Group: NFL Data Analysis

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Title: NFL performance analysis based on past performance and salary incentives

The Big Picture Question:

How well does past performance indicate future success and does the salary of top players really contribute to and derive from their abilities each year?

Explanation and additional questions:

Our proposed ideas and questions we would like to work on with the data sets we are (and will continue to) collecting. We will be looking at teams that have won the super bowl and analyzing what the probabilities of success are in the following seasons. To this end, here are some additional questions:

- How likely is a team, that has won the super bowl in a given year, to win again in the next 10 years? In the next 5 years? In the next year?
- How likely is a team, that has won the super bowl in a given year, to have winning seasons over the next 10 years? Over the next 5 years? In the next year?

We will be doing a simple test of the "home field advantage" concept for football to see if there really is a significant effect on teams' wins when they play at home or away. The question:

- Does "home field advantage" really exist in the NFL?

Finally, we will be looking at a few, randomly selected teams' salary information for active players over a 5 year time frame and comparing that to the team's record and franchise revenue streams to determine if what they are paid is actually tied to their performance. These questions are:

- Do increases in players salaries and team caps contribute to winning seasons in the following years?
- How does the yearly growth in franchise revenue compare to the success of the team's season? Here we could try to answer the question of team loyalty by fans and if salaries are more based on revenue than performance, within reason.

The Data:

- These data sets are compiled in excel to be "cleaned" of non-applicable factors and will then be loaded into R for statistical modeling and analysis. Some of these data sets are incomplete simply because we are constructing our experiment and will sue these data resources and inputs to acquire the proper data sets as needed.
  - Set 1: Super bowl outcomes
  - Variables: Year, winning team, losing team

Year	Lg	
2017	NFL	
2016	NFL	Super Bowl LI: New England Patriots (AFC14-2) defeated Atlanta Falcons (NFC11-5) Score: 34-28
2015	NFL	Super Bowl L: Denver Broncos (AFC12-4) defeated Carolina Panthers (NFC15-1) Score: 24-10
2014	NFL	Super Bowl XLIX: New England Patriots (AFC12-4) defeated Seattle Seahawks (NFC12-4) Score: 28-24
2013	NFL	Super Bowl XLVIII: Seattle Seahawks (NFC13-3) defeated Denver Broncos (AFC13-3) Score: 43-8
2012	NFL	Super Bowl XLVII: Baltimore Ravens (AFC10-6) defeated San Francisco 49ers (NFC11-4-1) Score: 34-31
2011	NFL	Super Bowl XLVI: New York Giants (NFC9-7) defeated New England Patriots (AFC13-3) Score: 21-17

- Set 2: Yearly Standings (Season record outcomes)
- Variables: Year, Team, Win percentage, Wins at home, Wins at Away

NFL - 2016 Regular Season						
NFL Team	Conf	Div	W	L	T	Pct
*- New England Patriots	AFC	ACE	14	2	0	.875
*- Dallas Cowboys	NFC	NCE	13	3	0	.813
z- Kansas City Chiefs	AFC	ACW	12	4	0	.750
y- Oakland Raiders	AFC	ACW	12	4	0	.750
z- Atlanta Falcons	NFC	NCS	11	5	0	.688
y- New York Giants	NFC	NCE	11	5	0	.688

PF	PA	Net Pts	TD	Home	Road
441	250	191	51	6-2	8-0
421	306	115	49	7-1	6-2
389	311	78	42	6-2	6-2
416	385	31	47	6-2	6-2
540	406	134	63	5-3	6-2
310	284	26	36	7-1	4-4

- Set 3: Franchise Revenue data by year
- Variables: Year, revenue (total)

Year	Cardinals	Falcons	Ravens	Bills	Panthers	Bears	Bengals
2001	123	120	148		152	124	130
2002	128	133	155	458	161	132	141
2003	131	144	172	564	169	175	150
2004	151	168	192	637	195	193	171
2005	165	170	201	708	199	201	175
2006	184	185	205	756	203	209	194
2007	194	203	226	821	221	226	205

- Set 4: Player salary by team
- Variables: Player, salary cap (hit for year), cap %, average player cap, total team cap

Active Players	Pos	Base salary	Signing Bonus	Roster Bonus	Option Bonus	Workout Bonus	Restru. Bonus	MISC	Dead Cap	Cap Hit	Cap %
Aaron Rodgers	QB	$11,500,000	$6,650,000	$600,000	-	$500,000	-	-	($25,300,000)	$19,250,000	12.4
Clay Matthews	OLB	$8,650,000	$4,100,000	$500,000	-	$500,000	-	-	($17,350,000)	$13,750,000	8.86
Julius Peppers	DE	$7,000,000	$2,500,000	$500,000	-	$500,000	-	-	($10,000,000)	$10,500,000	6.77
Randall Cobb	WR	$1,500,000	$3,250,000	$4,000,000	-	$400,000	-	-	($15,150,000)	$9,150,000	5.9
Jordy Nelson	WR	$5,500,000	$2,300,000	-	-	$500,000	-	-	($12,900,000)	$8,300,000	5.35
Mike Daniels	DT	$800,000	$2,400,000	$3,800,000	-	$400,000	-	-	($14,100,000)	$7,400,000	4.77
T.J. Lang	G	$4,600,000	$1,100,000	$281,250	-	$200,000	-	-	($5,900,000)	$6,181,250	3.98