How the Golden State Warriors are the Future of the NBA CS171 Final Project - Project Plan Michael Woo, George Zhang, Jeffrey Zhao

Basic info

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GitHub: https://github.com/gzhang01/CS171-Final-Project

Introduction

Since the initial project plan, we presented our ideas in studio, obtained feedback from our TF and peers, and met to redraft our visualizations to incorporate their feedback. Our goal continues to be to visualize trends in the NBA in light of the Golden State Warriors' historic season, but we have decided to focus on trends regarding three-point field goals. From our initial data analysis, we noticed that the percentage of three-point shots being taken has increased over the past decade, and we are interested to see whether successful teams and players are driving this trend.

New Sketches / Storyboard Description

We have modified our sketches to incorporate studio feedback. We had mentioned in our initial project plan that we wanted to view trends within the NBA, but failed to provide any visualizations that looked at data over time. We addressed this issue in our new sketches (see Visualization Sketches v2 #1 below). In this visualization, we are simply looking at the number of two-point, three-point, and total field goals per game. The goal here is to show that the number of three-point shots has been steadily increasing over time, revealing a change in game strategy. We plan to have a timeline below the main line graph that allows a user to brush over certain years to view more specific data, as well as selection buttons at the top that will show / hide the corresponding lines. When these lines are shown / hidden, the y axis will shift to allow for better visualization of certain lines. This goal of this interaction is to make sure trends in three-points field goals are not hidden in a scale that better suits total number of field goals.

Our second visualization (see Visualization Sketches v2 #2) aims to focus on one successful team in the NBA, specifically the Golden State Warriors. We plot shots that players on the team have attempted in various places on the court with a dot-density diagram. We hope to ultimately make this into a proportional symbol diagram as well, with the size of the dot corresponding to how many shots were taken from any particular location. The visualization will also be color-coded so that the color of each dot corresponds with shooting average compared to league average. We hope to show that a successful team generally has a higher shooting average from beyond the three-point line.

In visualization three, (see Visualization Sketches v2 #3) we are looking at a specific player, namely Stephen Curry. We want to look at the true shooting percentage of Curry in relation to his teammates, both over time (line graph) and per given amount of play time (scatter plot). We know that true shooting percentage tends to be higher for players who make many three-point field goals, since true shooting percentage normalizes for the difficulty of three-point shots, and so we assume a correlation between true shooting percentage and three-points shots made. In this way, when we compare the true shooting percentages of Curry and his teammates, we would expect to see Curry's numbers being generally higher. The two plots are linked through the data points on the line graph. Clicking on a specific year will bring up the scatterplot of players with data from that year. The axes of the scatter plot are labeled with the true shooting percentage in the y-axis and the shots/36 minutes in the x-axis. Additionally, the size of the dots within the scatter plot will encode the total amount of time played. This helps differentiate players who have a high true shooting percentage to shots ratio yet play meaningful minutes versus players who might have a high true shooting percentage to shots ratio yet play very few minutes.

The data for these visualizations will come from nba.com/stats and basketball-reference.com. Basketball-reference.com has downloadable csv files containing all the states which we can use for the first and third visualizations. We plan to use an NBA API to obtain data from nba.com/stats for the second visualization (see Datasets below).

Webpage Layout

Web Layout Page 1

CS171 Final Project



Introduction

Brisket short loin ham meutloaf. Strip steak meatball jerky brisket shank corned beef, landjaeger kielbasa leberkas pork loin chuck rump tenderloin. Shankle shoulder fillet nignon salami short ribs. Swine pork t-bone, shank kicken tri-tip turducken. Shoulder salami picanha, tail pastrami jowl beef tenderloin brisket pork loin frankfurter landjaeger leberkas. Strip steak frankfurter pork belly short ribs kielbasa, cupin pork loin shankle fatback short loin bacon cow brisket.

Swine cow turkey doner ball tip tail. Drumstick ham hock kevin, spare ribs jowl pork loin alcatra corned beef. Fathack venison rump prosciutto porchetta 1-bom sort loin beef strioin strip steak andouille bacon kleibasa. Shankle meatball corned beef filet mignon beef tenderloin rump boudin t-bone fatback sirloin hamburger capicola chuck bacon. Cow beef ribs ball tip strip steak sausage andouille prosciutio porchetta beef ham.

Trending 3 Point Shots

Strip steak shankle swine tri-tip turkey. Salami kevin short ribs jerky filet mignon. Cow meutball pork chop shankle, capicola salami ham hock. Beef cow picanha shoulder salami biltong doner andouille pastrami tail kielbasa drumstick alcatra ground round turkey. Meatloaf alcatra salami sirloin turkey leberkas landjaeger drumstick shankle ground round kielbasa capicola. Pastrami capicola pork chop drumstick short loin, pork belly shankle jeander.

Boudin pork loin tail ball tip picanha pork belly meatloaf. Jerky turducken prosciutto shoulder bacon. Shoulder shankle picanha, ball tip sirloin jowl swine corned beef t-bone pork loin. Ham salami andouille cupim pork belly ham hock drumstick capicola tail. Kevin tenderloin jerky t-bone, chicken pork chop pastrami bacon ball tip. Corned beef meatloaf ribeye ball tip.

Visualization 2

The Warriors Are Leading The Revolution

Strip steak shankle swine tri-tip turkey. Salami kevin short ribs jerky filet mignon. Cow meatball pork chop shankle, capicola salami ham hock. Beef cow picanha shoulder salami biltong doner andouille pastrami tall kielbasa drumstick alcatra ground round turkey. Meatloaf alcatra salami sirloin turkey leberkas landjaeger drumstick shankle ground round kielbasa capicola. Pastrami capicola pork chop drumstick short loin, pork belly shank picanha.

Boudin pork loin tail ball tip picanha pork belly meatloaf. Jerky turducken prosciutto shoulder bacon. Shoulder shankle picanha, ball tip sirloin jowl swine corned beef t-bone pork loin. Ham salami andouille cupim pork belly ham hock drumstick capicola tail. Kevin tenderloin jerky t-bone, chicken pork chop pastrami bacon ball tip. Corned beef meatloaf fibeve ball tip.

Visualization 3

Steph Curry is Driving This Warriors Team

Bacon ipsum dolor amet frankfurter picanha venison beef ribs landjaeger shankle. Drumstick doner leberkas, ham chuck spare ribs filet mignon kielbasa swine. Porchetta beef pig, pork chop pancetta doner tri-tip tongue salami. Picanha short ribs pig pork belly flank kevin hamburger pancetta kielbasa strip steak pork shoulder spare ribs filet mignon landjaeger. Short loin t-bone tri-tip sirioin corned beef ham capicola hamburger strip steak ball tip porchetta shankle pastrami boudin tenderloin. Rump brisket boudin shank sirioin pig picanha short ribs chuck pork belly tongue pancetta prosciutto hamburger capicola.

Conclusion

Bacon ipsum dolor amet frankfurter picanha venison beef ribs landjaeger shankle. Drumstick doner leberkas, ham chuck spare ribs filet mignon kielbasa swine. Porchetta beef pig, pork chop pancetta doner tri-tip tongue salami. Picanha short ribs pig pork belly flank kevin hamburger pancetta kielbasa strip steak pork shoulder spare ribs filet mignon landjaeger. Short loin t-bone tri-tip sirjoin comed beef ham capicola hamburger strip steak ball tip porchetta shankle pastrami boudin tenderloin. Rump brisket boudin shank sirjoin pie schanba short ribs euko kord belly tongue nancetta prosciuto hamburger erapicola.

Future Worl

Bacon ipsum dolor amet frankfurter picanha venison beef ribs landjaeger shankle. Drumstick doner leberkas, ham chuck spare ribs filet mignon kielbasa swine. Porchetta beef pig, pork chop pancetta doner tri-tip tongue salami. Picanha short ribs pig pork belly flank kevin hamburger pancetta kielbasa strip steak pork shoulder sparer ribs filet mignon landjaeger. Short bich in-bone tri-tip sirioni corned beef funa capicola hamburger strip steak ball tip porchetta shankle pastrami boudin tenderloin. Rump brisket boudin shank sirioin pig picanha short ribs chuck pork belly tongue pancetta prosciuto hamburger capicola.

Storytelling

In our project we want to help frame the Golden States Warriors historic season and the role the three point shot has to play in their season. In our first visualization, we highlight the trend of increasing three point shots at the league level over the past couple of seasons. This gives context to the kind of environment the NBA is currently in. After this, we explain how the Warriors are taking advantage of the 3-point shot and leading a 3-point shot revolution in the NBA. This visualization will show on a basketball court map the shot frequencies from every point in the court. The Warriors shoot an exceptionally high number of 3-point shots per game so we hope to illustrate that with this visualization. Finally, we take an even closer look at the Warriors' star player and 3-point shooter Steph Curry with our 3rd visualization. In this visualization we show how Curry is one of the best players in the NBA in his true field goal percentage. These three visualizations together highlight our story about how the Warriors are leading a 3-point shot revolution in the NBA, and it has helped them become the (arguably) winningest team in NBA history.

Feature List / Project Timeline

- Scraped data from nba.com/stats (April 4th, 2016)
- Redesign visualizations given extent of data we are able to collect (April 7th, 2016)
- Finish project redesign (April 11th, 2016)
- Viz 1 (April 14th, 2016)
- Viz 3 (April 14th, 2016)
- Viz 2 (April 18th, 2016)
- Textual context (April 18th, 2016)
- Prototype v2 based on feedback (April 25th, 2016)

- CSS / HTML styling for webpage (April 25th, 2016)
- Final Project (May 2nd, 2016)

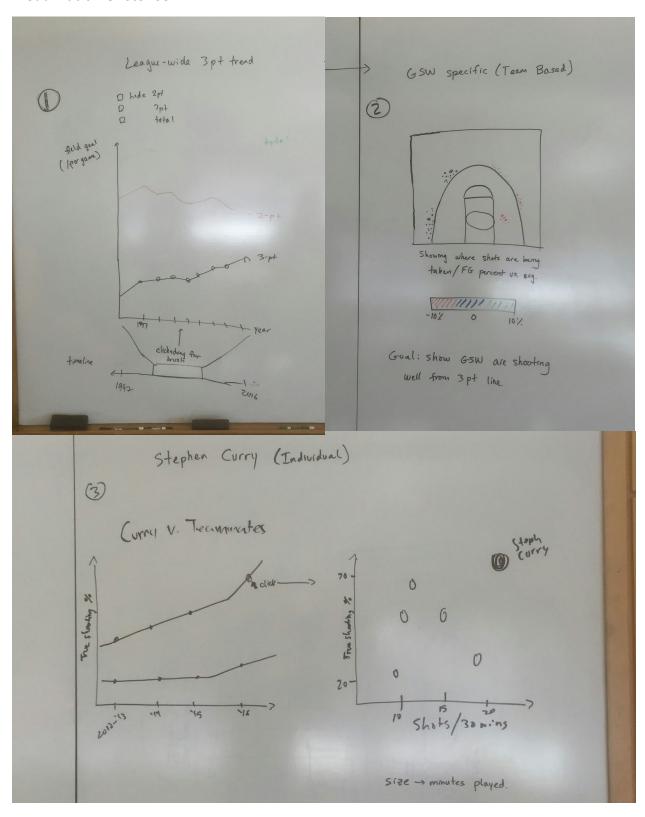
Team Roles

Coordinator: Michael Woo Submitter: Jeffrey Zhao

Final Notes

Viz exploration questionnaire for all members is in zipped file. Poster picture submitted to appropriate location on canvas by submitter.

Visualization Sketches v2



Datasets

For 1st visualization:

http://www.basketball-reference.com/leagues/NBA_stats.html

		-		Dor Gama	Per Game	Dar Gama	Per Gama	Per Game	Par Gama	Per Gama	Per Game	Par Gama	Dar Gama	Par Gama	Dar Gama	Dor Gam	o Por C	ama	Dar Game	Der Gama	Shooting	Shooting	Shooting
Rk	Season	Lg	G	MP MP	FG FG	FGA FGA	3P	3PA	FT Game	FTA FTA	ORB ORB	DRB	TRB	AST	STL	BLK BLK	TOV			PET Game PTS	FG%	3P%	FT%
	1 2015-16	NBA	1137	241.8												.8	5	14.4	20.4	102.6			
	2 2014-15	NBA	1230	242					17.1								4.8	14.4	20.2	100		0.35	
	3 2013-14	NBA	1230	242	37.7												4.7	14.6	20.7	101	0.454	0.36	
	4 2012-13	NBA	1229														5.1	14.6	19.8	98.1			
	5 2011-12	NBA	990														5.1	14.6	19.6	96.3		0.349	
	6 2010-11	NBA	1230	241.9													4.9	14.3	20.7	99.6			
	7 2009-10	NBA	1230	241.7	37.7	81.7	6.4	18.1	18.6	24.5	11	30.8	3 41.	7 21.	2 7	.2	4.9	14.2	20.9	100.4	0.461	0.355	0.759
	8 2008-09	NBA	1230	241.7	37.1	80.9	6.6	18.1	19.1	24.7	11	30.3	3 41.	3 2	1 7	.3	4.8	14	21	100	0.459	0.367	0.771
	9 2007-08	NBA	1230	241.5	37.3	81.5	6.6	18.1	18.8	24.9	11.2	30.8	3 4:	2 21.	8 7	.3	4.7	14.1	21	99.9	0.457	0.362	0.755
	10 2006-07	NBA	1230	242.2	36.5	79.7	6.1	16.9	19.6	26.1	11.1	29.9	41.	1 21.	3 7	.2	4.6	15.1	22.2	98.7	0.458	0.358	0.752
	11 2005-06	NBA	1230	242.1	35.8	79	5.7	16	19.6	26.3	11.2	29.8	3 4:	1 20.	6 7	.2	4.7	14.4	22.8	97	0.454	0.358	0.745
	12 2004-05	NBA	1230	241.9	35.9	80.3	5.6	15.8	19.7	26.1	. 12	29.8	3 41.5	9 21.	3 7	.5	4.9	14.5	22.6	97.2	0.447	0.356	0.756
	13 2003-04	NBA	1189	241.7	35	79.8	5.2	14.9	18.2	24.2	12.1	30.3	42.3	2 21.	3 7	.9	5.1	15	21.4	93.4	0.439	0.347	0.752
	14 2002-03	NBA	1189	242	35.7	80.8	5.1	14.7	18.5	24.4	12	30.3	3 42.	3 21.	5 7	.9	5	14.9	21.8	95.1	0.442	0.349	0.758
	15 2001-02	NBA	1189	241.7	36.2	81.3	5.2	14.7	17.9	23.8	12.2	30.2	42.4	4 21.	9 7	.8	5.2	14.5	21.2	95.5	0.445	0.354	0.752
	16 2000-01	NBA	1189	242	35.7	80.6	4.8	13.7	18.6	24.9			42.5	5 21.	8 7	.8	5.3	15	22.3	94.8	0.443	0.354	
	17 1999-00	NBA	1189	241.5	36.8	82.1	4.8	3 13.7	19	25.3	12.4	30.5	42.9	22.	3 7	.9	5.2	15.5	23.3	97.5	0.449	0.353	0.75
	18 1998-99	NBA	725	241.8												.4	5	15.3	22.2	91.6		0.339	
	19 1997-98	NBA	1189						19.4								5.1	15.5	22.4	95.6			
	20 1996-97	NBA	1189														4.9	15.7	22.1	96.9			
						Per Game	Per Game	Per Game			Per Game						e Per G			Per Game			Shooting
Rk	Season	Lg	G	MP	FG	FGA	3P	3PA	FT	FTA	ORB	DRB	TRB	AST	STL	BLK	TOV			PTS	FG%	3P%	FT%
	21 1995-96	NBA	1189	241.6	37	80.2	5.9	16	19.5	26.4	12.6	28.6	41.	3 22.	7	8	5.1	15.8	23	99.5	0.462	0.367	0.74
	22 1994-95	NBA	1107	241.9	38	81.5	5.5	15.3	19.9	27.1			41.0	5 23.	4 8	.3	5.2	15.9	23.5	101.4	0.466	0.359	0.737
	23 1993-94	NBA	1107	241.1	39.3	84.4	3.3	9.9	19.6	26.6			4	3 24.	4 8		5.2	16	22.2	101.5	0.466	0.333	0.734
	24 1992-93	NBA	1107	241.7	40.7	86	3	9	20.9	27.7	13.8	29.3	3 43.:	1 24.	7 8	.6	5.2	15.9	23.2	105.3	0.473	0.336	0.754
	25 1991-92	NBA	1107	241.8	41.3	87.3	2.5	7.6	20.2	26.7	14.4	29.3	3 43.	7 24.	5 8	.6	5.5	15.6	22.2	105.3	0.472	0.331	0.759
	26 1990-91	NBA	1107	241.8	41.4	87.2	2.3	7.1	21.3	27.9	14	29.3	3 43.3	3 24.	7 8	.6	5.3	16	23.2	106.3	0.474	0.32	0.765
	27 1989-90	NBA	1107	241.5	41.5	87.2	2.2	6.6	21.8	28.5	13.8	29.3	3 43.:	1 24.	9 8	.5	5.1	16.1	23.3	107	0.476	0.331	0.764
	28 1988-89	NBA	1025	241.5								29.4	43.5	25.	6 9	.1	5.3	17.2	23.7	109.2	0.477		
	29 1987-88	NBA	943	241.3	42.1	87.7	1.6	5 5	22.3	29.1	14.2	29.7	43.4	4 25.	8 8	.5	5.4	16.7	24.1	108.2	0.48	0.316	0.766
	30 1986-87	NBA	943	241.6			1.4	4.7	23.2	30.5	14.7	29.3	3 4	4 2	6 8	.6	5.5	17	24.5	109.9	0.48	0.301	0.763
	31 1985-86	NBA	943	241.6	43.2	88.6	0.9	3.3	22.9	30.3	14.1	29.4	43.6	5 2	6 8	.8	5.3	17.8	25.2	110.2	0.487	0.282	0.756
	32 1984-85	NBA	943	241.4	43.8	89.1	0.9	3.1	22.4	29.4	14.3	29.3	43.5	5 26.	3 8	.5	5.3	17.9	24.9	110.8	0.491	0.282	0.764
	33 1983-84	NBA	943	242													5.3	17.9	25.8	110.1			
	34 1982-83	NBA	943	241.3													5.6	19.1	25.6	108.5			
	35 1981-82	NBA	943	241.6													5.4	17.7	26.2	108.6			
	36 1980-81	NBA	943	241.4	43	88.4	0.5				14.5	28.9	43.5	5 25.	5	9	5.3	18.7	25.1	108.1	0.486		
	37 1979-80	NBA	902														5.3	18.9	24.4	109.3			
	38 1978-79	NBA	902	241.1	44.5	91.7			21.3	28.3	14.8	30.4	45.	2 25.	8 9	.1	5.4	19.8	25.3	110.3	0.485		0.752
	39 1977-78	NBA	902	241.8	43.6	92.9	,		21.4	28.4	15	32.3	47.:	1 2	5 9	.6	5.1	20.1	25.2	108.5	0.469		0.752
	40 1976-77	NBA	902	241	42.8	92			20.8	27.7	15	32.3	47.	1 23.	9 9	.4	5.1	20.6	25.2	106.5	0.465		0.751
				Per Game	Per Gam	e Per G	Same I	Per Game	Per Game	Shooting	Shooting	Shooting											
Rk	Season	Lg	G	MP	FG	FGA	3P	3PA	FT	FTA	ORB	DRB	TRB	AST	STL	BLK	TOV			PTS	FG%	3P%	FT%
	41 1975-76	NBA	738	241.4	42.1	91.7			20.2	26.9	14.4	33	3 47.4	4 2	3 8	.9	4.4	19.8	24.8	104.3	0.458		0.751
	42 1974-75	NBA	738						19.3								4.3	19.8	24.3	102.6			0.765
	43 1973-74	NBA	697						19.6								4.7	20.8	23.8	105.7			0.771
	44 1972-73	NBA	697	240.9					19.2			551.	50.0				-	_5.0	22.8	107.6			0.758
	45 1971-72	NBA	697	241.1					23.3				51.						23.6	110.2			0.748
	46 1970-71	NBA	697	241					24.3				53.						24.4	112.4			0.745

For 2nd visualization:

Sample data set included in zipped file.

For 3rd visualization:

http://www.basketball-reference.com/players/c/curryst01.html#all_advanced

Α	В	С	D	E	F	G	Н	1	J	K	L	М	N	0	Р	Q	R	S
Season	Age	Tm	Lg	Pos	G	MP	PER	TS%	3PAr	FTr	ORB%	DRB%	TRB%	AST%	STL%	BLK%	TOV%	USG%
2009-10	2	1 GSW	NBA	PG	80	2896	16.3	0.568	0.332	0.175	1.	8 12	6.	B 24.	6 2.	0.5	5 16.5	21.8
2010-11	2	2 GSW	NBA	PG	74	2489	19.4	0.595	0.325	0.216	2.	3 10.9	6.	5 28.	1 2.:	0.6	5 16.4	24.4
2011-12	2	3 GSW	NBA	PG	26	732	21.2	0.605	0.409	0.159	2.	3 11.3	6.	B 32.	3 2.1	0.8	B 17	24
2012-13	2	4 GSW	NBA	PG	78	2983	21.3	0.589	0.432	0.21	2.	3 9.1	5.5	B 31.	1 2.:	L 0.3	3 13.7	26.4
2013-14 â~	2	5 GSW	NBA	PG	78	2846	24.1	0.61	0.445	0.252	1.	8 10.9	6.	4 39.	9 2.:	0.4	4 16.1	28.3
2014-15 â~	2	6 GSW	NBA	PG	80	2613	28	0.638	0.482	0.251	2.	4 11.4		7 38.	6	0.5	5 14.3	28.9
2015-16 â~	2	7 GSW	NBA	PG	73	2487	31.4	0.671	0.553	0.258	2.	9 13.6	8.	5 33.	1	3 0.4	4 13	32.5
Career			NBA		489	17046	23.1	0.614	0.435	0.227	2.	2 11.3	6.1	B 32.	5 2.5	0.5	5 15	26.8