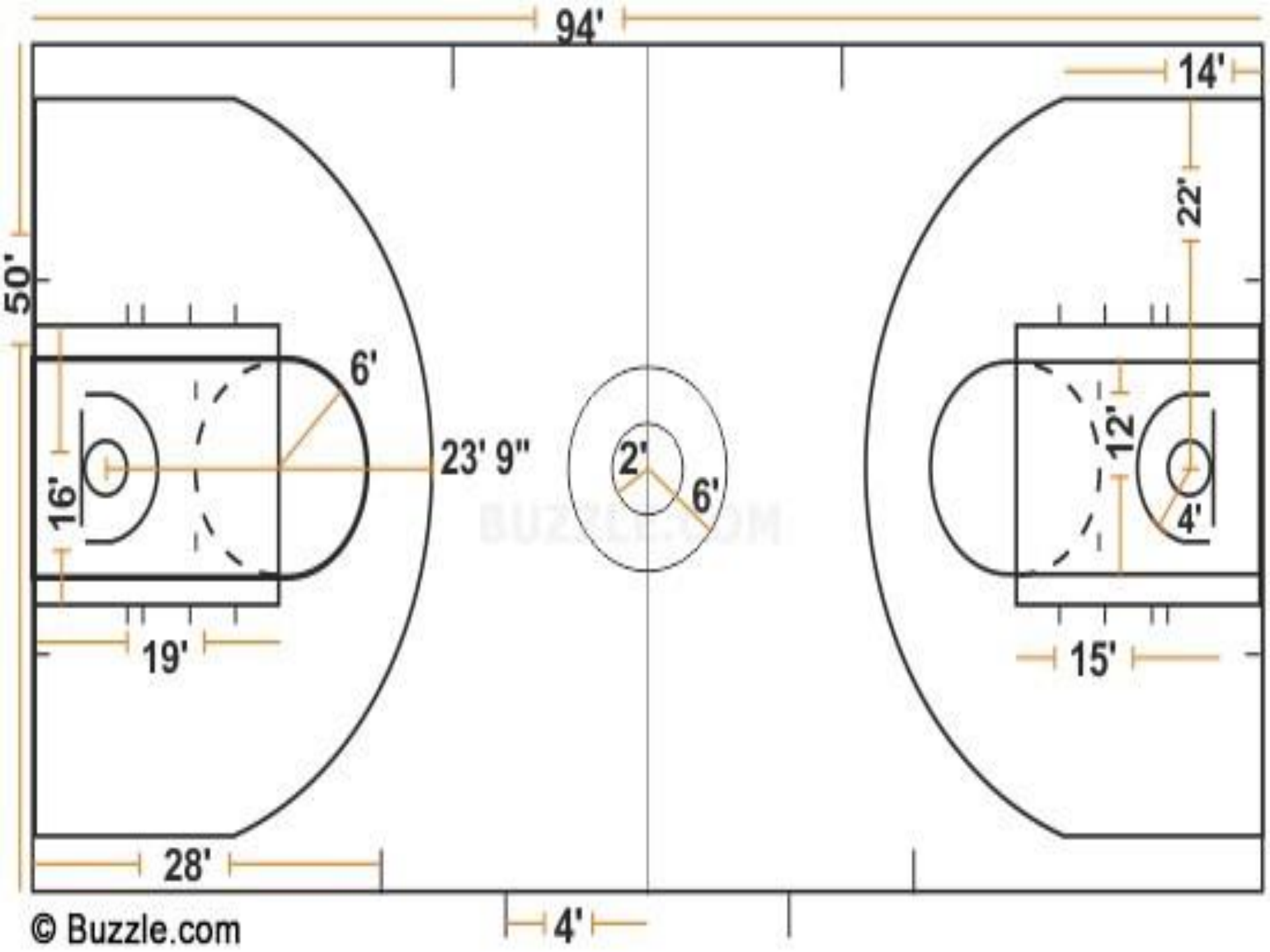
THREEEEE!

- In the past three years there has been a proliferation of 3 point attempts in the NBA (led by the Golden State Warriors)
- 2013-2014 Regular Season: ~1,763 3PA
- 2014-15 Regular Season: ~1,837 3PA
- 2016-2017 Regular Season: ~1,976 3PA
- In a three year span NBA teams are attempting approx. 3 more 3PA per game, and 8 more 3PA per game since 2005-06

DATASET #1

Not All Shots Are Created Equal

- NBA teams realized 3 points > 2 points (apologies for the simplification)
- There are places on the court where the expected value of a 2PA is greater than that of a 3PA and vice versa


94'
14'
22'
50'
6'
23' 9"
2'
6'
12'
4'
16'
19'
15'
28'
4'
© Buzzle.com

Shooting Strategy

- NBA teams have invested heavily in player-tracking cameras in order to generate data of the real-time positioning of players on the court
- As a result, there's now data on types of shots taken (layup, pull up shot, hook shot, etc.), distance of shot taken, distance of nearest defender when shot taken, etc.
- **Problem:** Using NBA regular season data from 2011 to 2016, what type of shots characterize the most efficient offenses (by points per possession)?
- **Hypothesis:** Open 3 point shots, from any location on the court, will have the highest expected points value.

Shots Dataset

	RESTRICTED AREA			IN THE PAINT (NON-RA)			MID-RANGE			LEFT CORNER 3			RIGHT CORNER 3			ABOVE THE BREAK 3		
TEAM	FGM	FGA	FG%	FGM	FGA	FG%	FGM	FGA	FG%	FGM	FGA	FG%	FGM	FGA	FG%	FGM	FGA	FG%
Atlanta Hawks	18	29.5	60.9	4.1	10.3	40.1	8	19.3	41.5	1.1	3.1	34.9	1.4	3.1	43.6	6.2	19.4	31.9
Boston Celtics	16.7	27.8	60	4.3	10.8	40.1	6.5	15.6	41.5	1.3	3.3	41.2	1.6	3.5	45.2	8.5	24.5	34.5
Brooklyn Nets	17.2	29.6	57.9	5.5	12.2	45	3.8	10.5	36.2	1.3	4	33.1	1.2	3.3	35.8	8.4	25.3	33.2
Charlotte Hornets	16.1	27	59.8	5.1	12.5	40.4	7.4	19.5	37.8	0.9	2.4	36.4	0.7	1.6	43.1	7.9	22.5	35.1
Chicago Bulls	15.9	28.1	56.3	6.3	13.8	45.9	9.4	24.8	37.9	1.1	2.6	43.3	0.7	2.4	28.9	4.3	14.8	29.2
Cleveland Cavaliers	16	25.3	63.4	3	8.6	34.5	7	18.2	38.7	2.4	5.2	45.7	1.9	4.6	41.8	8.7	23.1	37.6
Dallas Mavericks	11.5	18.7	61.3	4.9	11.3	43.4	8.5	22.1	38.5	1.1	3	37.5	1.1	3	37.7	8.3	23.9	34.5
Denver Nuggets	18.2	31.5	57.7	5.4	12.5	43.3	6.1	16.1	37.9	1	3.2	31.9	1.1	2.4	47.6	7.6	21.3	35.7
Detroit Pistons	14.2	23.5	60.5	6.7	16.5	40.7	10.2	23.7	43.2	1.2	2.6	44.3	0.9	2.4	37.1	5.6	17	33
Golden State Warriors	19.1	28.2	68	4.6	10.2	44.8	8	18.1	44.2	1.1	3.1	36.1	1.5	3.6	40.2	9.2	23.7	38.7
Houston Rockets	19.7	30.2	65.3	3.1	9.4	33.2	2.9	7.5	38.4	1.3	3.5	37.8	1.9	4.5	42.3	11.8	31.3	37.5
Indiana Pacers	14.7	24.4	60.4	6	13.9	43.3	10.1	24.4	41.1	1.4	3.4	42.3	0.7	2.3	31.3	5.8	16.4	35.7
LA Clippers	16	26	61.4	3.4	9.1	37.3	9.4	21.7	43.3	1.3	3.2	40	1.2	3.1	37.4	7.7	20.3	37.9
Los Angeles Lakers	16.8	27.1	62	5.2	14.7	35.2	7.3	18.6	39.3	1.3	3.2	42.5	1	2.7	38.2	6.8	19.5	34.8
Memphis Grizzlies	14.2	26.3	53.9	5.2	12.9	40.1	7.3	19.1	38.2	1.1	2.7	42	1.1	2.5	41.5	6.6	19.9	33.3
Miami Heat	16.2	28.2	57.4	5.6	14	40.2	7.4	19	39.2	1.5	3.8	39.3	1.7	4.3	38.7	5.4	16.7	32.6
Milwaukee Bucks	20.8	33	63.2	4.6	12.1	38	5.7	15	38.2	1	3.4	29.5	1.2	3.4	36.3	6.3	16.7	37.9
Minnesota Timberwolves	16.3	27.6	59.2	4.9	11.5	42.3	8.6	21.5	40.1	1.5	3.7	40	0.8	2.1	38.7	5.9	17.6	33.8
New Orleans Pelicans	15.6	26.6	58.8	5.3	13	41.1	8.2	21.9	37.6	1.1	2.9	36.5	0.8	2.2	38.5	6.9	20.3	34.3
New York Knicks	16.2	28	57.9	4.2	10.8	38.6	10.3	25.8	40.1	1.1	2.7	39.6	1.3	2.7	46.2	6.6	19.2	34.4
Oklahoma City Thunder	20.3	33.1	61.2	4.9	11.4	42.5	6	16	37.3	1.5	3.7	40.2	1.2	3.8	31.9	5.7	17.9	31.7
Orlando Magic	14.5	24.1	60	5.7	13.7	41.3	8.9	22.1	40.3	0.8	2.5	30.1	0.9	2.5	35.9	7.3	21.1	34.5
Philadelphia 76ers	15.5	26.1	59.7	4	10.9	36.4	6.5	17.6	37.2	1.3	2.7	46.7	0.9	2.5	35.4	8.4	24.2	34.5
Phoenix Suns	17.8	30	59.2	5.2	13.1	40	8	21.6	37.1	1.1	3.6	31.3	1.2	3.6	34.4	5.8	16.3	35.5
Portland Trail Blazers	15.9	26.3	60.2	4.8	11.9	40	8.2	18.6	43.9	1.1	3.3	33.3	1.2	3.1	39.6	8	22.1	36.1
Sacramento Kings	17.3	28.7	60.3	5	12.6	39.6	6.3	17.1	36.7	1.3	3.2	40	1.1	3	35.9	6.4	18.2	34.8
San Antonio Spurs	13.8	22.6	61.3	5.1	11.7	43.3	11	25.6	43	1.5	3.3	44.7	1.5	3.3	44.3	6.2	15.3	40.3
Toronto Raptors	14.8	24.2	61.1	6.8	14.7	46.1	8.9	21.9	40.9	1.5	3.9	38.3	1	2.7	37.8	7	17.6	39.5
Utah Jazz	15.5	24.6	63.2	4.9	11	44.6	5.9	15.6	38.1	1.2	3.3	36.7	1.1	3.1	34.5	7.4	19.7	37.7
Washington Wizards	16.4	27	60.8	5.6	12.7	44.4	10.1	23.5	43	1.1	2.9	37.4	0.8	2.9	28.1	6.1	16.8	36.4

NBA's Overpaid/Underpaid Players

- NBA teams are subject to a salary cap- a limit to the total amount of money NBA teams are allowed to pay their players
- Therefore:

Limited Team Payroll→ Efficient Salary Allocation (based player's performance)

DATASET #2

Evaluating Player Performance

- 5 players on a court
  - Difficult to evaluate an individual player's performance independent from other players on court
  - While elite players (superstars) stand out, more difficult to evaluate players below the superstar tier
- So, ideally, if our elite players will receive the highest salaries, where do the less talented players fall in the salary totem pole?
  - Answer: NBA teams make mistakes and thus often misallocate resources!

Economics of NBA Salaries

- Asking which players in the NBA are overpaid/underpaid is equivalent to asking: Which players will provide the highest or lowest return on investment for their NBA team?
- **Problem:** Using NBA regular season performance data from 2013 to 2016 and 2016-17 player salaries, which NBA players are most likely to perform at a high level relative to their salary (as a % of their team's salary cap) over the next 3 years?
- **Hypothesis:** Players with 3 years or less of experience that produce at an elite level will provide the highest return on investment for an NBA team

Player Performance Data

PLAYER	TEAM	AGE	GP	W	L	MIN	OFFRTG	DEFRTG	NETRTG	AST%	AST/TO	AST RATIO	OREB%	DREB%	REB%	TO RATIO	EFG%	TS%	USG%	PACE	PIE
Dahntay Jones	CLE	35	1	0	1	42.4	104.3	110.4	-6.1	6.7	0	12.5	2.8	11.4	7	0	46.4	46.4	15.7	92.42	4.7
James Harden	HOU	26	82	41	41	38.1	107.2	106	1.2	35.4	1.64	20.6	2.2	15.7	8.9	12.6	51.2	59.8	32.5	99.83	17.4
Kyle Lowry	TOR	30	77	54	23	37	108.6	102.6	6	29.3	2.2	23.2	2.3	12.4	7.4	10.5	51.6	57.8	26	95.37	14.5
Jimmy Butler	CHI	26	67	37	30	36.9	102.5	103.3	-0.8	21.8	2.43	18.9	3.5	11.6	7.7	7.8	48.5	56.2	24.5	97.89	14.1
Kentavious Caldwell-Pope	DET	23	76	41	35	36.7	104.6	102.6	2	7.5	1.31	10.6	2.6	8.5	5.5	8.1	47.9	52.1	18	97.94	7.7
Gordon Hayward	UTA	26	80	38	42	36.2	103.8	102.8	1	18.1	1.47	15.5	2.5	13.5	8	10.6	49.3	55.9	25.6	93.85	12.6
John Wall	WAS	25	77	37	40	36.2	104	103.3	0.7	44.9	2.48	30.3	1.7	13.8	7.6	12.2	46.7	51	28.4	100.57	14.4
Khris Middleton	MIL	24	79	33	46	36.1	104.6	104.7	-0.1	18.3	1.84	18.5	1.8	10.3	6.1	10.1	50.7	56	22.9	97.43	10.8
Brandon Knight	PHX	24	52	16	36	36	100.7	107.5	-6.8	23.4	1.49	18.6	2.1	9.9	5.9	12.5	48.2	52.2	26.3	100.71	10.1
DeMar DeRozan	TOR	26	78	53	25	35.9	107.1	104.1	3	20.8	1.8	14.6	2.7	11.6	7.2	8.1	46.3	55	29.7	95.9	13.9
Kevin Durant	OKC	27	72	52	20	35.8	113.4	102.2	11.2	23	1.44	16.3	2.1	20.9	12.3	11.3	57.3	63.4	30.5	100.22	19.4
Marcus Morris	DET	26	80	42	38	35.7	104.9	103.1	1.8	10.7	1.44	14.3	3.4	12.6	7.8	10	49.1	53.1	18.4	97.35	8.6
Damian Lillard	POR	25	75	40	35	35.7	108.1	107.3	0.9	33	2.12	21.1	1.8	10.5	6.1	10	49.7	56	31	99.4	14.3
LeBron James	CLE	31	76	56	20	35.6	112.4	101.4	11	33.9	2.06	21.5	4.7	18.7	11.9	10.4	55.1	58.8	31.1	95.84	18.9
Kemba Walker	CHA	26	81	47	34	35.6	106.4	102.2	4.2	25.3	2.46	19.9	2.1	11.6	6.8	8.1	49.5	55.4	26.5	97.73	13.5
Anthony Davis	NOP	23	61	24	37	35.5	102.6	107.3	-4.7	10	0.96	7.4	6.4	26.2	16	7.7	50.8	55.9	29.6	99.13	16.5
Trevor Ariza	HOU	31	81	40	41	35.3	107.3	107	0.4	10	1.66	15.3	2.6	11.9	7.2	9.2	52.3	55.1	15.8	99.36	8.4
Giannis Antetokounmpo	MIL	21	80	32	48	35.3	103.9	106.5	-2.6	19.5	1.66	19.8	4.7	20.2	12.5	11.9	52	56.6	22.3	96.65	12.8
Rajon Rondo	SAC	30	72	29	43	35.2	103.3	106.8	-3.4	47.3	3.02	42.7	3.3	15	9.3	14.1	49.4	50.6	18.7	103.23	13
Carmelo Anthony	NYK	32	72	32	40	35.1	105.1	105.8	-0.7	20.9	1.7	15.3	4.3	19.5	12.1	9	47.4	53	29.5	95.84	14

People-based Marketing

- Fluent is a people-based marketing platform that delivers new customer acquisition at scale
- Typically, users that come through a Fluent owned and operated (O2) site sign up for e-newsletters, savings and discount programs, etc.
- We deliver quality and drive performance for our clients by targeting based on user PII data acquired through a registration process and a survey

DATASET #3

Selling merchandise

- Good at identifying and delivering qualified users when clients are seeking new potential customers
- Must improve at selling merchandise
- OR rather at identifying online shoppers- users who will take out their credit card and pay

Opportunity

- Since the merchandise we offer users is through a broker, we don't assume the cost of the merchandise
- However, we don't get paid unless merchandise is sold from our O2 sites
- **Problem:** Using 2016 data of merchandise purchasers on Fluent sites, what characteristics are most likely to be associated with future merchandise purchasers?
- **Hypothesis:** An older (>45 years of age) female user will most likely be the ideal merchandise buyer

Snippet of Potential Data

SoldDate	Email	FirstName	LastName	City	State	Region	C_USZip	Phone	C_Dob	Gender	MobileWeb	mBrowser	DeviceDetails	Carrier	vaf	vag	vdr	vl9
5/5/2016 11:41					VA	South Region	22304	5712780131	3/11/1995	Female	Mobile	Safari	iPhone	T-Mobile	yes	rent	no	null
5/5/2016 14:39					NC	South Region	28504	2523618799	1/7/1995	Female	Mobile	Chrome	Android	Verizon Wi	yes	rent	no	null