NBA Lottery

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I. Introduction

The NBA has been around for decades and the process of building a championship contender/team has changed through the years. For a while there was no free agency, so teams built through draft and trading players. Once free agency came into the league players were able to maneuver through teams at free will once their contract had expired. Till this day those 3 transaction scenarios, draft, trades and free agency, are the only way teams can acquire players and build the best team they can. When the draft first started the team with the worst record always got the #1 pick, which in return they can choose the best player coming into the draft. After some accusations of teams losing on purpose to get the first pick the NBA introduced the lottery system. This gave teams who did not make the playoffs specific odds of winning the prized top pick. But no matter the lottery odds or system some teams still found it beneficial to lose as many games as possible. This later became known as tanking, teams will purposefully lose as many games as possible to gather up the best odds to win the NBA Draft Lottery.

Tanking became so prevalent and obvious that the NBA had to change the lottery system. Instead of the worst team having the best odds every single year the 3 worst teams will all have the same chance to win the lottery. The NBA is hoping this will return a result of less tanking in the league as the worst record still doesn't guarantee the top pick in the draft.

For my program I will be looking at the teams from 2009-2018 and see which teams had the worst record, for how many years, who won the lottery and who they drafted. Then I will be following their records to see if their process of tanking was worth the years of losing and embarrassment.

II. Questions

Since tanking has taken over the NBA many fans and analysts have wondered, is it worth it? Teams losing at a ridiculous rate for a chance to get the top draft pick even though it is not a guarantee. That is what I want to look into and see if teams have actually succeeded in tanking. I will have to break down my questions into sections in order to get the output/results I am looking for.

Team:

1. Who had the worst record at the end of the NBA season?
2. Did they win the lottery?
    a. If not, who did?
3. Who did they end up drafting?
    a. The team with the worst record
    b. The team that won the lottery
4. What was the record for the following years of the team that is tanking?

Player:

1. How did the player's career end up with the team that drafted him?
    a. WS

III. Data

Gathering Data:

To start, I will be gathering the win/loss data from a CSV file I found through kaggle.com. This was the perfect data set I needed to be able to determine which teams were in the lottery. The CSV file had every win/loss record for every team from the 1948 season up until the 2018 season. It also included other data points that would be relevant to see how good a team is during the season. Next I needed another to find who the draft picks were for the teams that either won the lottery or were in it. I found this data through kaggle.com as well and am able to use it for my project. This dataset had every lottery draft pick from 1995-2020 as well as some of their career statistics.

Season	Lg	Team	W	L	W/L%	Finish	SRS	Pace	Rel_Pace	ORtg	Rel_ORtg	DRtg	Rel_DRtg	Playoffs	Coaches	Top WS
2017-18	NBA	Boston Ce	29	10	0.744	1	4.38	95.4	-1.7	108	0.2	102.8	-5		B. Steveni	K. Irving (5.7)
2016-17	NBA	Boston Ce	53	29	0.646	1	2.25	96.8	0.4	111.2	2.4	108.4	-0.4	Lost E. Cor	B. Steveni	I. Thomas (12.5)
2015-16	NBA	Boston Ce	48	34	0.585	2	2.84	98.5	2.7	106.8	0.4	103.6	-2.8	Lost E. Cor	B. Steveni	I. Thomas (9.7)
2014-15	NBA	Boston Ce	40	42	0.488	2	-0.4	95.8	1.9	104.7	-0.9	104.5	-1.1	Lost E. Cor	B. Steveni	T. Zeller (6.5)
2013-14	NBA	Boston Ce	25	57	0.305	4	-4.97	93.3	-0.6	102.9	-3.8	107.7	1		B. Steveni	B. Bass (5.1)
2012-13	NBA	Boston Ce	41	40	0.506	3	-0.62	91.7	-0.3	103.1	-2.8	103.3	-2.6	Lost E. Cor	D. Rivers (	P. Pierce (7.2)
2011-12	NBA	Boston Ce	39	27	0.591	1	2.26	90.4	-0.9	101	-3.6	98.2	-6.4	Lost E. Cor	D. Rivers (	P. Pierce (7.0)
2010-11	NBA	Boston Ce	56	26	0.683	1	4.83	90.4	-1.7	106.2	-1.1	100.3	-7	Lost E. Cor	D. Rivers (	P. Pierce (11.6)
2009-10	NBA	Boston Ce	50	32	0.61	1	3.37	91.6	-1.1	107.7	0.1	103.8	-3.8	Lost Final	D. Rivers (	R. Rondo (9.6)
2008-09	NBA	Boston Ce	62	20	0.756	1	7.44	90.4	-1.3	110.5	2.2	102.3	-6	Lost E. Cor	D. Rivers (	R. Allen (11.1)
2007-08	NBA	Boston Ce	66	16	0.805	1	9.3	90.9	-1.5	110.2	2.7	98.9	-8.6	Won Final	D. Rivers (	K. Garnett (12.9)
2006-07	NBA	Boston Ce	24	58	0.293	5	-3.7	92	0.1	103.2	-3.3	106.9	0.4		D. Rivers (	A. Jefferson (6.6)
2005-06	NBA	Boston Ce	33	49	0.402	3	-1.59	92.2	1.7	105.2	-1	106.9	0.7		D. Rivers (	P. Pierce (11.5)
2004-05	NBA	Boston Ce	45	37	0.549	1	0.35	93.3	2.4	107.5	1.4	106.6	0.5	Lost E. Cor	D. Rivers (	P. Pierce (11.2)
2003-04	NBA	Boston Ce	36	46	0.439	4	-1.99	93.2	3.1	102.1	-0.8	103.7	0.8	Lost E. Cor	J. O'Brien	P. Pierce (7.1)
2002-03	NBA	Boston Ce	44	38	0.537	3	-0.75	90.9	-0.1	101.2	-2.4	101.6	-2	Lost E. Cor	J. O'Brien	P. Pierce (10.1)
2001-02	NBA	Boston Ce	49	33	0.598	2	1.75	92.5	1.8	103.4	-1.1	101	-3.5	Lost E. Cor	J. O'Brien	P. Pierce (12.9)
2000-01	NBA	Boston Ce	36	46	0.439	5	-2.4	92.6	1.3	101.4	-1.6	103.7	0.7		R. Pitino (	P. Pierce (10.4)
1999-00	NBA	Boston Ce	35	47	0.427	5	-1	94.6	1.5	104.8	0.7	105.6	1.5		R. Pitino (	P. Pierce (8.2)
1998-99	NBA	Boston Ce	19	31	0.38	5	-1.75	91.5	2.6	100.4	-1.8	102.4	0.2		R. Pitino (	P. Pierce (4.9)
1997-98	NBA	Boston Ce	36	46	0.439	6	-1.96	93.3	3	102.6	-2.4	105.4	0.4		R. Pitino (	D. Barros (5.6)
1996-97	NBA	Boston Ce	15	67	0.183	7	-6.62	95.8	5.7	103.9	-2.8	111.4	4.7		M. Carr (1	D. Wesley (6.1)
1995-96	NBA	Boston Ce	33	49	0.402	5	-3.37	96.2	4.4	106.4	-1.2	109.9	2.3		M. Carr (3	D. Wesley (6.3)
1994-95	NBA	Boston Ce	35	47	0.427	3	-1.92	94	1.1	108.6	0.3	110.6	2.3	Lost E. Cor	C. Ford (3	D. Brown (6.8)
1993-94	NBA	Boston Ce	32	50	0.39	5	-4.28	95.6	0.5	104.2	-2.1	108.7	2.4		C. Ford (3	D. Brown (6.4)
1992-93	NBA	Boston Ce	48	34	0.585	2	0.93	94.9	-1.9	108.7	0.7	107.8	-0.2	Lost E. Cor	C. Ford (4	R. Lewis (8.3)
1991-92	NBA	Boston Ce	51	31	0.622	1	3.41	95.8	-0.8	110.8	2.6	107	-1.2	Lost E. Cor	C. Ford (5	R. Lewis (9.1)
1990-91	NBA	Boston Ce	56	26	0.683	1	5.22	98.5	0.7	112.6	4.7	106.7	-1.2	Lost E. Cor	C. Ford (5	R. Parish (10.0)
1989-90	NBA	Boston Ce	52	30	0.634	2	3.23	98.2	-0.1	112	3.9	107.9	-0.2	Lost E. Cor	J. Rodgers	K. McHale (11.1)
1988-89	NBA	Boston Ce	42	40	0.512	3	1.26	98.1	-2.5	110.8	3	109.6	1.8	Lost E. Cor	J. Rodgers	R. Parish (10.5)
1987-88	NBA	Boston Ce	57	25	0.695	1	6.15	97.9	-1.7	115.4	7.4	109.4	1.4	Lost E. Cor	K. Jones (	L. Bird (15.0)
1986-87	NBA	Boston Ce	59	23	0.72	1	6.57	98.6	-2.2	113.5	5.2	106.8	-1.5	Lost Final	K. Jones (	L. Bird (15.2)
1985-86	NBA	Boston Ce	67	15	0.817	1	9.06	101.2	-0.9	111.8	4.6	102.6	-4.6	Won Final	K. Jones (	L. Bird (15.8)
1984-85	NBA	Boston Ce	63	19	0.768	1	6.47	101.6	-0.5	112.8	4.9	106.3	-1.6	Lost Final	K. Jones (	L. Bird (15.7)
1983-84	NBA	Boston Ce	62	20	0.756	1	6.42	99.7	-1.7	110.9	3.3	104.4	-3.2	Won Final	K. Jones (	L. Bird (13.6)
1982-83	NBA	Boston Ce	56	26	0.683	2	5.34	104	0.9	106.9	2.2	101.8	-2.9	Lost E. Cor	B. Fitch (5	L. Bird (14.0)
1981-82	NBA	Boston Ce	63	19	0.768	1	6.35	101.5	0.6	109.8	2.9	103.5	-3.4	Lost E. Cor	B. Fitch (6	L. Bird (12.5)
1980-81	NBA	Boston Ce	62	20	0.756	1	6.05	100.8	-1	108.4	2.9	102.6	-2.9	Won Final	B. Fitch (6	C. Maxwell (11.0)
1979-80	NBA	Boston Ce	61	21	0.744	1	7.37	102.6	-0.5	109.4	4.1	101.9	-3.4	Lost E. Cor	B. Fitch (6	C. Maxwell (12.2)
1978-79	NBA	Boston Ce	29	53	0.354	5	-4.78	106.5	0.7	101.6	-2.2	106.4	2.6		T. Sanders	C. Maxwell (11.7)
1977-78	NBA	Boston Ce	32	50	0.39	3	-1.86	105.9	-0.8	99.1	-1.8	100.9	0		T. Heinsol	D. Cowens (10.8)
1976-77	NBA	Boston Ce	44	38	0.537	2	-1.9	107.5	1	96.5	-3	98.3	-1.2	Lost E. Cor	T. Heinsol	J. White (6.5)
1975-76	NBA	Boston Ce	54	28	0.659	1	2.25	106.9	1.4	98.9	0.6	96.7	-1.6	Won Final	T. Heinsol	D. Cowens (10.7)
1974-75	NBA	Boston Ce	60	22	0.732	1	5.4	106.1	1.6	100	2.3	94.7	-3	Lost E. Cor	T. Heinsol	J. Havlicek (9.7)
1973-74	NBA	Boston Ce	56	26	0.683	1	3.42	110	2.2	98.6	0.9	95.1	-2.6	Won Final	T. Heinsol	J. Havlicek (9.7)
1972-73	NBA	Boston Ce	68	14	0.829	1	7.35	114.5	3.8	98.1	1.3	91	-5.8	Lost E. Cor	T. Heinsol	J. Havlicek (12.1)
1971-72	NBA	Boston Ce	56	26	0.683	1	4.38	116.1	4.1	99.3	1.4	95.2	-2.7	Lost E. Cor	T. Heinsol	J. Havlicek (12.4)
1970-71	NBA	Boston Ce	44	38	0.537	3	2.3	120.2	5.1	97	-0.2	95.3	-1.9		T. Heinsol	J. Havlicek (12.5)
1969-70	NBA	Boston Ce	34	48	0.415	6	-1.6	117.5	0.4	97.3	-1.7	98.9	-0.1		T. Heinsol	J. Havlicek (10.6)
1968-69	NBA	Boston Ce	48	34	0.585	4	5.35	117.5	0.6	93.8	-1.7	89.1	-6.4	Won Final	B. Russell	B. Howell (11.3)
1967-68	NBA	Boston Ce	54	28	0.659	2	3.87	121.1	1.3	95.7	-1.1	92.4	-4.4	Won Final	B. Russell	B. Howell (10.1)
1966-67	NBA	Boston Ce	60	21	0.741	2	7.24	121.2	-0.4	97.5	1.4	91	-5.1	Lost E. Div	B. Russell	B. Russell (12.2)
1965-66	NBA	Boston Ce	54	26	0.675	2	4.34	122	0.6	92.3	-2.6	88.3	-6.6	Won Final	R. Auerba	B. Russell (11.7)
1964-65	NBA	Boston Ce	62	18	0.775	1	7.46	123.6	6.3	90.9	-2.7	84.2	-9.4	Won Final	R. Auerba	B. Russell (16.9)
1963-64	NBA	Boston Ce	59	21	0.738	1	6.93	125	11.8	90.1	-4.5	83.8	-10.8	Won Final	R. Auerba	B. Russell (17.3)

CSV File of Win/Loss Record Every Year

	pick_over	Year	team_id	player	college_n	seasons	g	mp	pts	trb	ast	fg_pct	fg3_pct	ft_pct	mp_per_g	pts_per_g	trb_per_g	ast_per_g	ws	ws_per_4	bpm	vorp
smithjo02	1	1995	GSW	Joe Smith	Maryland	16	1030	27022	11208	6575	1010	0.455	0.238	0.79	26.2	10.9	6.4	1	60.3	0.107	-1.5	3
mcdyean0	2	1995	LAC	Antonio N	Alabama	15	1015	28053	12227	7638	1300	0.497	0.117	0.67	27.6	12	7.5	1.3	69.8	0.119	-0.1	13.2
stackje01	3	1995	PHI	Jerry Stac	UNC	18	970	30222	16409	3067	3240	0.409	0.309	0.822	31.2	16.9	3.2	3.3	52.4	0.083	0.3	17.4
wallara01	4	1995	WSB	Rasheed \	UNC	16	1109	36243	16006	7404	1994	0.467	0.336	0.721	32.7	14.4	6.7	1.8	105.1	0.139	2.2	38.4
garneke0	5	1995	MIN	Kevin Garnett		21	1462	50418	26071	14662	5445	0.497	0.275	0.789	34.5	17.8	10	3.7	191.4	0.182	5.6	96.9
reevebr01	6	1995	VAN	Bryant Re	Oklahoma	6	395	12071	4945	2745	623	0.475	0.074	0.703	30.6	12.5	6.9	1.6	13	0.052	-3.4	-4.3
stoudda0	7	1995	TOR	Damon St	Arizona	13	878	29106	11763	3039	5371	0.406	0.357	0.833	33.2	13.4	3.5	6.1	55.4	0.091	0.3	16.8
respesh0	8	1995	POR	Shawn Re	Michigan	4	172	2350	851	226	177	0.414	0.34	0.816	13.7	4.9	1.3	1	2.1	0.043	-2.3	-0.2
obannedC	9	1995	NJN	Ed O'Banr	UCLA	2	128	2062	634	316	102	0.367	0.222	0.755	16.1	5	2.5	0.8	1.1	0.025	-3.5	-0.7
thomaku(	10	1995	MIA	Kurt Thon	TCU	18	1110	27160	8973	7328	1204	0.486	0.281	0.76	24.5	8.1	6.6	1.1	64.2	0.114	-0.7	8.6
trentga01	11	1995	MIL	Gary Tren	Ohio Univ	9	506	9866	4366	2276	504	0.501	0.08	0.643	19.5	8.6	4.5	1	23.2	0.113	-1	2.4
parksch0	12	1995	DAL	Cherokee	Duke	9	472	7459	2056	1703	265	0.47	0.211	0.63	15.8	4.4	3.6	0.6	11.8	0.076	-2.4	-0.7
willico02	13	1995	SAC	Corliss Wi	Arkansas	12	822	18749	9147	3183	972	0.49	0.136	0.714	22.8	11.1	3.9	1.2	34.7	0.089	-2	-0.1
willier01	14	1995	BOS	Eric Willia	Providenc	12	658	15731	5642	2139	936	0.415	0.318	0.736	23.9	8.6	3.3	1.4	23.2	0.071	-2.4	-1.5

CSV File of Players Drafted in the Lottery

Cleaning Data:

Since the lottery didn't start until 1985 I would have to clean up and erase the season that I would not be using. But this dataset also had certain data points that I thought were unnecessary. Columns such as: Lg, SRS, Pace, Rel_Pace, Rel_ORtg, Rel_DRtg, Coaches, Top WS are not needed for what I am looking for in this assignment so I dropped them from the overall dataset. Next, I had to fill in the playoffs columns with "Lottery", as this set left the teams that didn't make the playoffs blank. After that I had to drop all the seasons that I was not using for this assignment. This part was a little more difficult for me as when I first tried to use the drop method it would not work. For example if I put team_record.drop(1946-1947), it would come back with a "Key Error: '[1899]' not found in axis". This confused me as I did not put that in my code, but I realized it was subtracting the season years instead of looking at it as a string. So I converted all my data into strings in order to be able to subtract it easier and was able to get the years I needed. Unfortunately before I started this project, I did not look closely at all the data in this CSV file and did not realize that this was made in the middle of the 2017-18 season, so it did not have all the games played, thus I could not use that season.

	Season	Team	W	L	W/L%	Finish	ORtg	DRtg	Playoffs
4	2013-14	Boston Celtics	25	57	0.305	4	102.9	107.7	Lottery
77	2012-13	Toronto Raptors	34	48	0.415	5	105.9	107.5	Lottery
78	2011-12	Toronto Raptors	23	43	0.348	4	100.8	104.5	Lottery
79	2010-11	Toronto Raptors	22	60	0.268	5	106.1	112.9	Lottery
80	2009-10	Toronto Raptors	40	42	0.488	2	111.3	113.2	Lottery
...	...	...	...	...	...	...	...	...	...
1423	2016-17	Dallas Mavericks	33	49	0.402	5	105.6	108.8	Lottery
1427	2012-13	Dallas Mavericks	41	41	0.5	4	105.9	106.5	Lottery
1468	2009-10	Memphis Grizzlies	40	42	0.488	4	108.3	109.9	Lottery
1469	2008-09	Memphis Grizzlies	24	58	0.293	5	103.5	109.5	Lottery
1470	2007-08	Memphis Grizzlies	22	60	0.268	5	105.0	111.4	Lottery

140 rows × 9 columns

Team_Record.csv file cleaned

For the lottery_picks.csv file there was not as much cleaning I needed to do compared to the previous file. I first had to start with adding a name to the first column as it was nameless. I had to do this in order to drop the column along with others using this code:

lottery_picks.drop(['college_name', 'bpm', 'vorp', 'nickname'], axis=1, inplace=True)

Once I dropped those columns, I had to get the players who were drafted #1 overall. Since my project requires me to look at the teams and the players they drafted I wanted to start off by looking at the player that was drafted by the team who won the lottery. After that I just got the players who fit in my time frame of 2009-2018. I dropped all the other players as they were not needed for this assignment.

	pick_overall	Year	team_id	player	seasons	g	mp	pts	trb	ast	fg_pct	fg3_pct	ft_pct	mp_per_g	pts_per_g	trb_per_g
182	1	2008	CHI	Derrick Rose	11.0	596.0	19402.0	11185.0	2031.0	3334.0	0.456	0.304	0.827	32.6	18.8	3.4
196	1	2009	LAC	Blake Griffin	10.0	622.0	21671.0	13479.0	5501.0	2749.0	0.498	0.333	0.694	34.8	21.7	8.8
210	1	2010	WAS	John Wall	9.0	573.0	20545.0	10879.0	2483.0	5282.0	0.433	0.324	0.781	35.9	19.0	4.3
224	1	2011	CLE	Kyrie Irving	9.0	528.0	17827.0	11842.0	1955.0	3012.0	0.466	0.390	0.877	33.8	22.4	3.7
238	1	2012	NOH	Anthony Davis	8.0	528.0	18239.0	12677.0	5483.0	1182.0	0.515	0.319	0.802	34.5	24.0	10.4
252	1	2013	CLE	Anthony Bennett	4.0	151.0	1905.0	658.0	472.0	77.0	0.392	0.261	0.670	12.6	4.4	3.1
266	1	2014	CLE	Andrew Wiggins	6.0	454.0	16242.0	8943.0	1977.0	1065.0	0.441	0.332	0.732	35.8	19.7	4.4
280	1	2015	MIN	Karl-Anthony Towns	5.0	358.0	12307.0	8113.0	4209.0	992.0	0.534	0.396	0.831	34.4	22.7	11.8
294	1	2016	PHI	Ben Simmons	3.0	217.0	7449.0	3553.0	1800.0	1726.0	0.560	0.083	0.593	34.3	16.4	8.3
308	1	2017	PHI	Markelle Fultz	3.0	105.0	2676.0	1125.0	351.0	481.0	0.452	0.267	0.677	25.5	10.7	3.3
322	1	2018	PHO	Deandre Ayton	2.0	109.0	3419.0	1849.0	1165.0	197.0	0.570	0.176	0.748	31.4	17.0	10.7

Lottery_Teams.csv Data Cleaned

The last part I needed with this csv file was to get the players who were drafted by the team who actually had the worst record that year. This was a little harder as I could not just grab random players or select random draft pick numbers, I had to go back and individually grab the players they drafted in each year they were the worst team.

IV. Data Exploration

Teams:

After cleaning all my data, I was finally able to write some code in order to get the answers to my questions. The first question that I wanted to find the answer to was who were the worst teams from 2008-2017. This was done by using the .groupby function for the season, team and finding the lowest percent value of the win/loss column from each year. The initial outcome from this part of the assignment surprised me right away. As someone who has followed the NBA my

whole life, I thought there would be multiple seasons of the same team at the bottom trying to tank for the #1 pick. The Minnesota Timberwolves (2010-11&2014-15) and the New Jersey/Brooklyn Nets (2009-2010&2016-17) were the only teams to repeat during the time period I chose. The reason I chose the timeframe I did for this assignment is because around this time is when the league and fans started to think that tanking was at its worst. It was considered so bad that the league even had to implement new draft lottery odds to even the playing field for teams who were not "tanking'. So to see that only 2 teams in this time period were the worst teams in the league definitely surprised me.

```
#the worst team each year into a dataframe
worst_team_year.sort_values('Season')
```

	Season	Team	W	L	W/L%	Finish	ORtg	DRtg	Playoffs
960	2008-09	Sacramento Kings	17	65	0.207	5	105.5	114.7	Lottery
244	2009-10	New Jersey Nets	12	70	0.146	5	100.6	110.5	Lottery
294	2010-11	Minnesota Timberwolves	17	65	0.207	5	104.2	111.1	Lottery
1184	2011-12	Charlotte Bobcats	7	59	0.106	5	95.2	110.4	Lottery
1211	2012-13	Orlando Magic	20	62	0.244	5	101.6	109.1	Lottery
632	2013-14	Milwaukee Bucks	15	67	0.183	5	103.0	111.8	Lottery
290	2014-15	Minnesota Timberwolves	16	66	0.195	5	102.9	112.2	Lottery
169	2015-16	Philadelphia 76ers	10	72	0.122	5	98.8	109.2	Lottery
237	2016-17	Brooklyn Nets	20	62	0.244	5	104.1	110.7	Lottery

Worst Team Each Year

```
#New Jersey Nets had the worst record this year
worst_team['2009-10']
```

```
Team
Detroit Pistons           0.329
Golden State Warriors     0.317
Houston Rockets           0.512
Indiana Pacers             0.39
Los Angeles Clippers      0.354
Memphis Grizzlies         0.488
Minnesota Timberwolves    0.183
New Jersey Nets           0.146
New Orleans Hornets       0.451
New York Knicks           0.354
Philadelphia 76ers        0.329
Sacramento Kings          0.305
Toronto Raptors           0.488
Washington Wizards        0.317
```

```
#Brooklyn Nets had the worst record this year
worst_team['2016-17']
```

```
Team
Brooklyn Nets             0.244
Charlotte Hornets         0.439
Dallas Mavericks          0.402
Denver Nuggets            0.488
Detroit Pistons           0.451
Los Angeles Lakers        0.317
Miami Heat                  0.5
Minnesota Timberwolves    0.378
New Orleans Pelicans      0.415
New York Knicks           0.378
Orlando Magic             0.354
Philadelphia 76ers        0.341
Phoenix Suns              0.293
Sacramento Kings           0.39
```

Nets Worst Record

```
#Minnesota Timberwolves had the worst record this year
worst_team['2010-11']
```

```
Team
Charlotte Bobcats         0.415
Cleveland Cavaliers       0.232
Detroit Pistons           0.366
Golden State Warriors     0.439
Houston Rockets           0.524
Los Angeles Clippers       0.39
Milwaukee Bucks           0.427
Minnesota Timberwolves    0.207
New Jersey Nets           0.293
Phoenix Suns              0.488
Sacramento Kings          0.293
Toronto Raptors           0.268
Utah Jazz                 0.476
Washington Wizards         0.28
```

```
#Minnesota Timberwolves had the worst record this year
worst_team['2014-15']
```

```
Team
Charlotte Hornets         0.402
Denver Nuggets            0.366
Detroit Pistons            0.39
Indiana Pacers            0.463
Los Angeles Lakers        0.256
Miami Heat                0.451
Minnesota Timberwolves    0.195
New York Knicks           0.207
Oklahoma City Thunder     0.549
Orlando Magic             0.305
Philadelphia 76ers         0.22
Phoenix Suns              0.476
Sacramento Kings          0.354
Utah Jazz                 0.463
```

Timberwolves Worst Record

After finding out which team had the worst record I wanted to track their progress for the following 4 years. I wanted to see if they truly were tanking or actually trying to get better. Once again I was surprised to see that the overall W/L% kept rising through the years of all the teams. And not many kept on losing or "tanking" as you can see from my code

Next I had to look to see where the worst team drafted that year in the NBA Draft. For this I used my other csv file, Lottery-Picks.csv to help determine that for me. Since I know now which team had the worst record each year it was pretty easy to go through this file/data frame in order to figure where they ended up drafting and who they drafted. The results of the worst team's draft position did not surprise me unlike the previous data exploration of the worst teams. Since no one team is guaranteed to win the lottery even if the worst team has the highest odds, it was no surprise to see that the worst team of the season has only won the Draft Lottery 3 times between 2009-2018. (Disclaimer: Since the Lottery-Picks.csv file had the draft pick for the 2018 NBA Draft, it showed that the Phoenix Suns had the worst record and won the draft) But what was surprising is that no team that had the worst record each year ever drafted below 4th. So the teams that did end up with the worst record did get high draft picks in the end. The team that end up winning the lottery is shown below:

```
#teams that won the lottery
first_pick_teams.sort_values('Season')
```

	Season	Team	W	L	W/L%	Finish	ORtg	DRtg	Playoffs
862	2008-09	Los Angeles Clippers	19	63	0.232	4	102.3	111.7	Lottery
1099	2009-10	Washington Wizards	26	56	0.317	5	104.2	109.4	Lottery
517	2010-11	Cleveland Cavaliers	19	63	0.232	5	102.2	111.8	Lottery
1412	2011-12	New Orleans Hornets	21	45	0.318	5	100.9	105.1	Lottery
515	2012-13	Cleveland Cavaliers	24	58	0.293	5	104.3	109.4	Lottery
514	2013-14	Cleveland Cavaliers	33	49	0.402	3	104.2	107.7	Lottery
290	2014-15	Minnesota Timberwolves	16	66	0.195	5	102.9	112.2	Lottery
169	2015-16	Philadelphia 76ers	10	72	0.122	5	98.8	109.2	Lottery
237	2016-17	Brooklyn Nets	20	62	0.244	5	104.1	110.7	Lottery

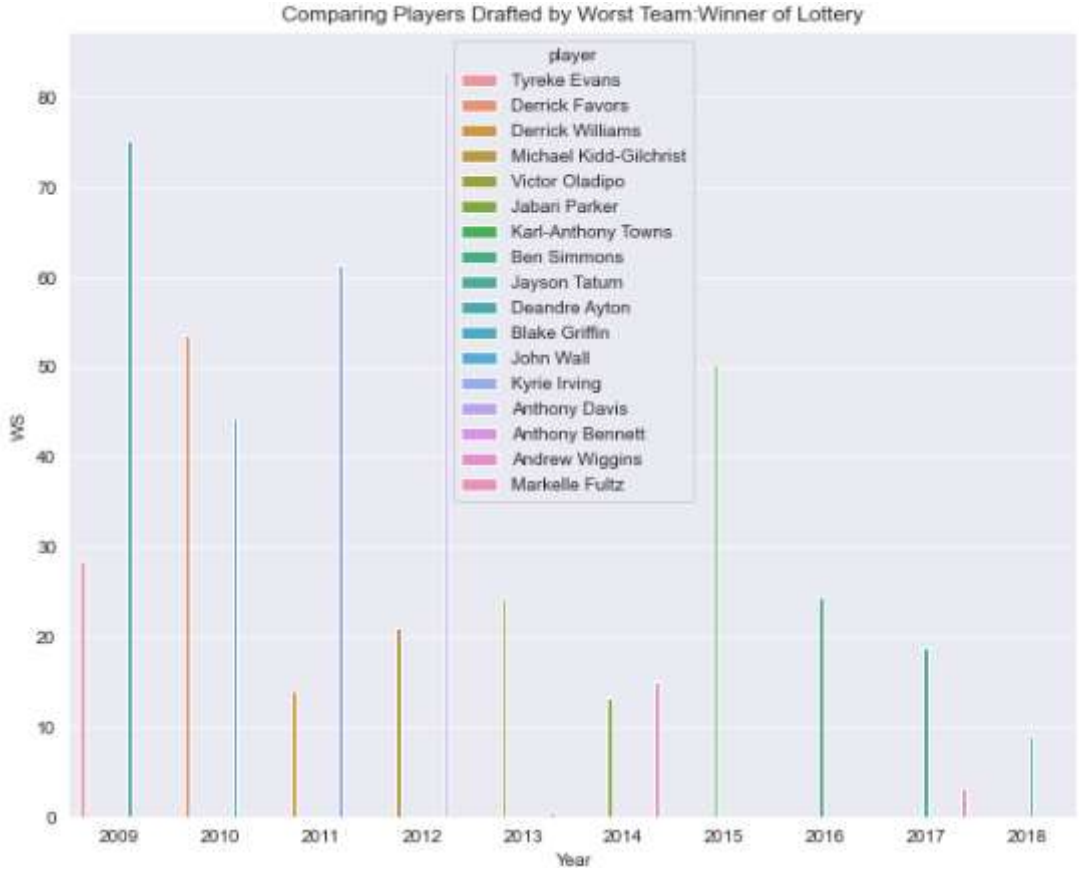
Winner of the NBA Draft Lottery

Player:

I was able to find this out with the help of the Lottery-Picks.csv file as well. With that file I sorted out which players got drafted #1 in the years in question and was able to find the team that drafted them as well.

Next I had to find out who the worst team of each year drafted and how effective they were within their career. For this I looked at 1 particular category to see how well they performed within their NBA careers, this statistic was Win Shares. Win Shares determines how well a player plays on offense and defense given their playing time. As the inventor Justin Kubatko explained, "A win share is worth one-third of a team win. If a team wins 60 games, there are 180

‘Win Shares’ to distribute among the players. So this is a great statistic to determine not only if a player puts up good stats, but most importantly if they are helping the team win. I was able to plot a graph to compare each year’s draft pick Win Share as shown here.



pick_overall	Year	team_id	player
4	2009	SAC	Tyreke Evans
3	2010	NJN	Derrick Favors
2	2011	MIN	Derrick Williams
2	2012	CHA	Michael Kidd-Gilchrist
2	2013	ORL	Victor Oladipo
2	2014	MIL	Jabari Parker
1	2015	MIN	Karl-Anthony Towns
1	2016	PHI	Ben Simmons
3	2017	BOS	Jayson Tatum
1	2018	PHO	Deandre Ayton

pick_overall	Year	team_id	player
1	2009	LAC	Blake Griffin
1	2010	WAS	John Wall
1	2011	CLE	Kyrie Irving
1	2012	NOH	Anthony Davis
1	2013	CLE	Anthony Bennett
1	2014	CLE	Andrew Wiggins
1	2015	MIN	Karl-Anthony Towns
1	2016	PHI	Ben Simmons
1	2017	PHI	Markelle Fultz
1	2018	PHO	Deandre Ayton

The first bar in each year would be the draft pick of the team that had the worst record, while the second bar was the #1 draft pick. This shows that even if teams get a high draft lottery pick, not every player drafted that high or even #1 pans out. So the risk of losing that many games and fans support could go against the teams potentially tanking for that pick.

V. Conclusion

Unfortunately the results that I got from this data did not turn out what I thought it would become. I thought it would be more obvious and prevalent that teams were tanking for the worst draft pick every year. Fans and analysts have been talking about for years that the NBA has a tanking problem. Yes, maybe one year a team decides they have no shot and would like to try and bid for a high draft pick. But with the outcome I was able to gather from my program a couple of teams were repeated as the worst that year and in fact were trying to get better. But what I did find out was that teams that were the worst during that time in the league rarely won the NBA Draft Lottery. This may be the reason why teams are choosing not to tank and instead continue to compete for their fans. From the outside as a fan it looks like the teams are tanking, but after running my program I realize the statements I made in the introduction were solely based on assumptions and not actual data realization.

There were some other factors that I had not considered until in the middle of doing this project that I should have considered before beginning. Teams make trades before and during the draft that may include the #1 pick, just like in 2017, when the Brooklyn Nets traded their pick to Boston early on and then Boston flipped that pick to the 76ers. This has to be taken into account because if a team picks early that doesn't mean that they were bad or tanking. Also trades, free agency, ownership/GM changes should all be taken into account when trying to determine what a team is trying to do.

VI. Next Steps

Although I was able to work on this project throughout the semester I know there is more that could be possible to try and find out if teams were in actuality tanking. If given more time there are some other steps I could have taken in order to write a program to better determine if they were losing on purpose. Such as, gathering more data like transactions during the NBA season to see if teams are selling their best players so they can lose on purpose. Also to gather mid-season statistics to see if the team realizes they were not good enough to compete and thus decides to throw in the towel and try for a higher draft pick.

Data and Source:

https://www.kaggle.com/datasets/boonpalipatana/nba-season-records-from-every-year

https://www.kaggle.com/datasets/skandasastry/nba-lottery-picks-from-1995-2020/version/1