Buckets & Brackets: A Data-Driven Look at NBA Playoff Contenders

Introduction:

As a lifelong sports enthusiast and basketball fan, I knew I wanted my capstone project to focus on something that felt personally exciting, while still challenging me to apply the data analytics tools I've learned. I decided to explore what makes an NBA team a playoff contender, using team-level performance data over the past 25+ seasons.

Rather than tackling a highly complex machine learning problem, I focused on creating a clean, insightful, and flexible dataset that could support both descriptive analysis and potential future modeling. This project tested my ability to work with real-world data, clean and preprocess it, and communicate findings visually. I used Microsoft Excel for data cleaning and Tableau for data visualization.

Data Collection & Source:

To begin, I sourced a dataset from basketball-reference.com that included team-level statistics from the 1996–97 NBA season through the 2022–23 season. This dataset covered regular season game-level stats for all NBA teams over that period.

I downloaded a ZIP file containing two CSV files:

- team_traditional.csv – containing team stats for every regular season and playoff game
- team_traditional_regular_season.csv – used later after filtering for regular season games only

I used Microsoft Excel to begin the cleaning process and Tableau for data visualization.

Business Problem:

NBA teams are constantly striving to make the playoffs, a benchmark that defines success for front offices, coaches, and players alike. With limited resources and high competition, it's essential for teams to understand which statistical factors most contribute to playoff qualification. Making the playoffs also brings increased revenue opportunities through ticket sales, merchandise, TV exposure, and sponsorships — making this not just a basketball goal, but a business one as well.

This project aims to uncover those factors by analyzing historical team performance data, helping identify what differentiates playoff teams from non-playoff teams.

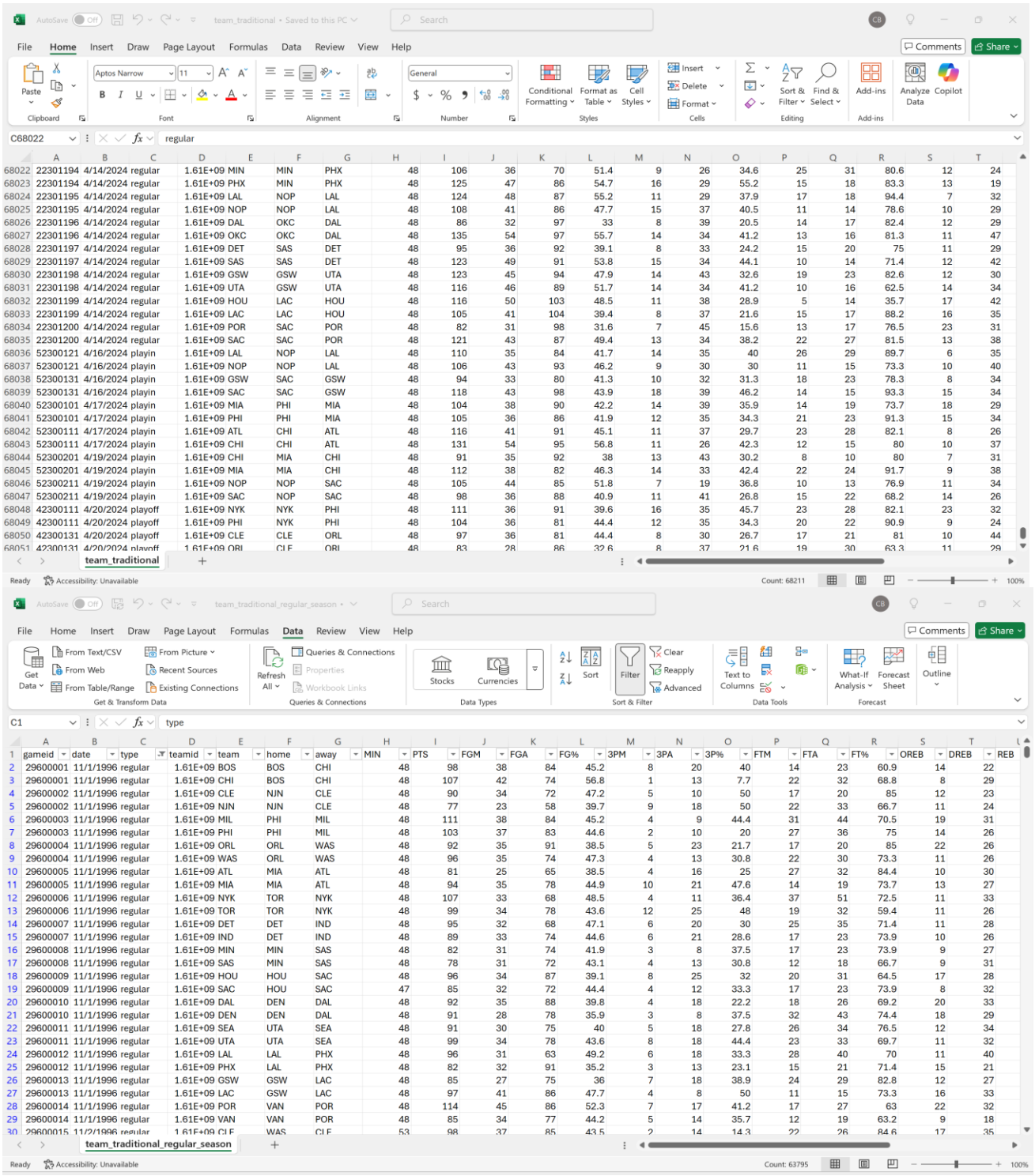
Data Analytics Problem:

Using team-level performance data from the 1996–97 to 2022–23 NBA seasons, this project seeks to answer the question: What statistical patterns are associated with teams that make the playoffs?

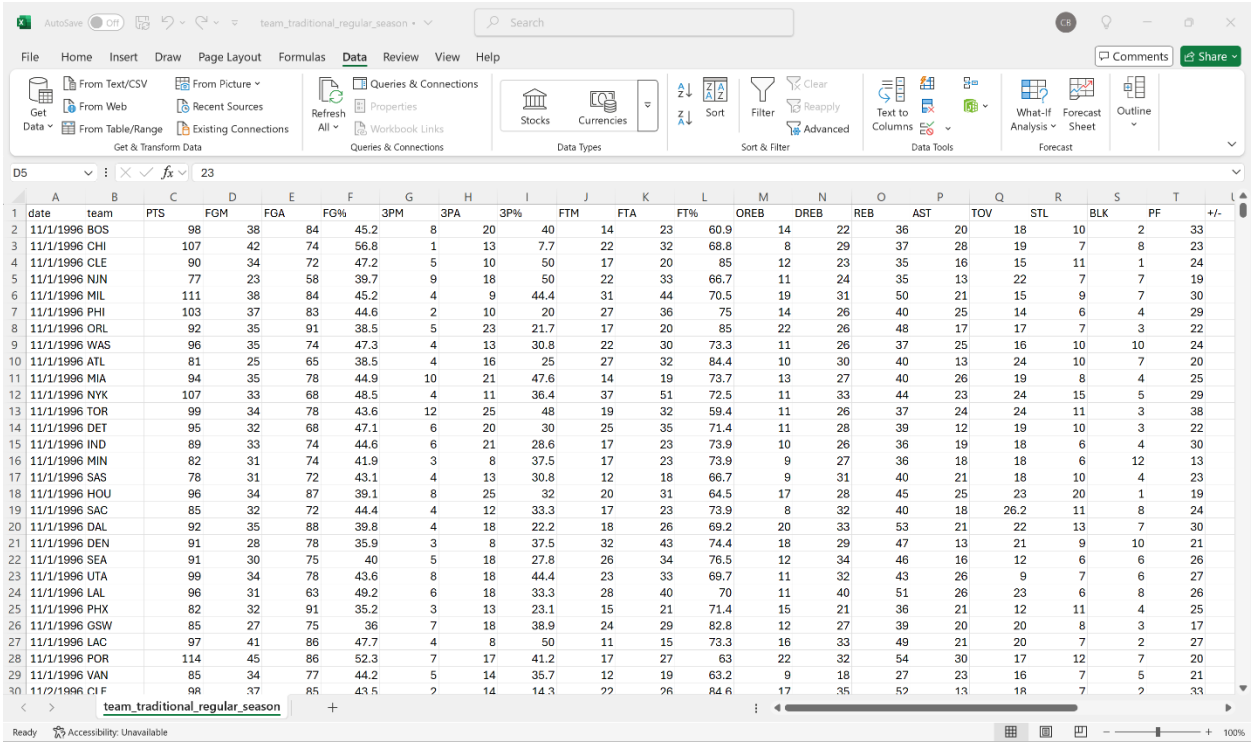
I aim to structure, clean, and aggregate the dataset to compare playoff vs non-playoff teams, then visualize trends and insights using Tableau. The goal is to build a foundation for future predictive modeling and performance forecasting.

Data Preprocessing

I began by importing the dataset into Excel, focusing only on regular season games to ensure consistent comparisons across teams. From there, I went through several cleaning and transformation steps to prepare the data for analysis in Tableau. Each step was documented and captured with screenshots to demonstrate the progression of the dataset.

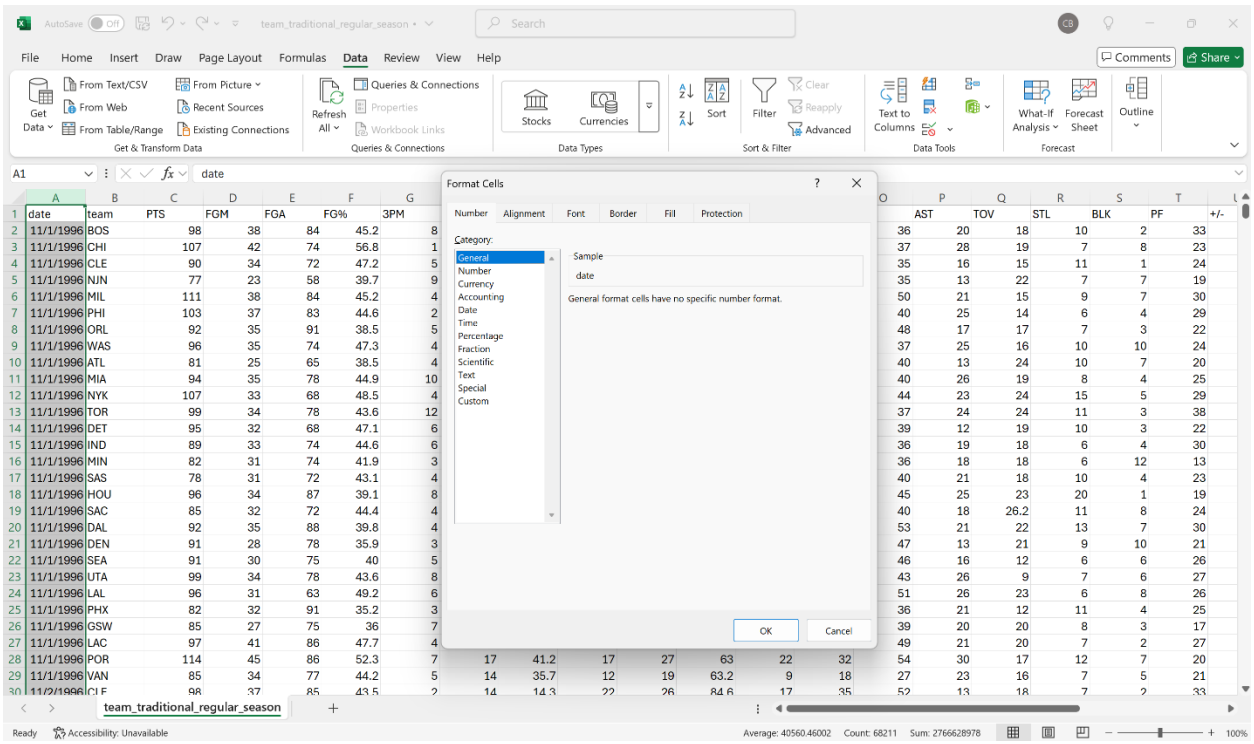


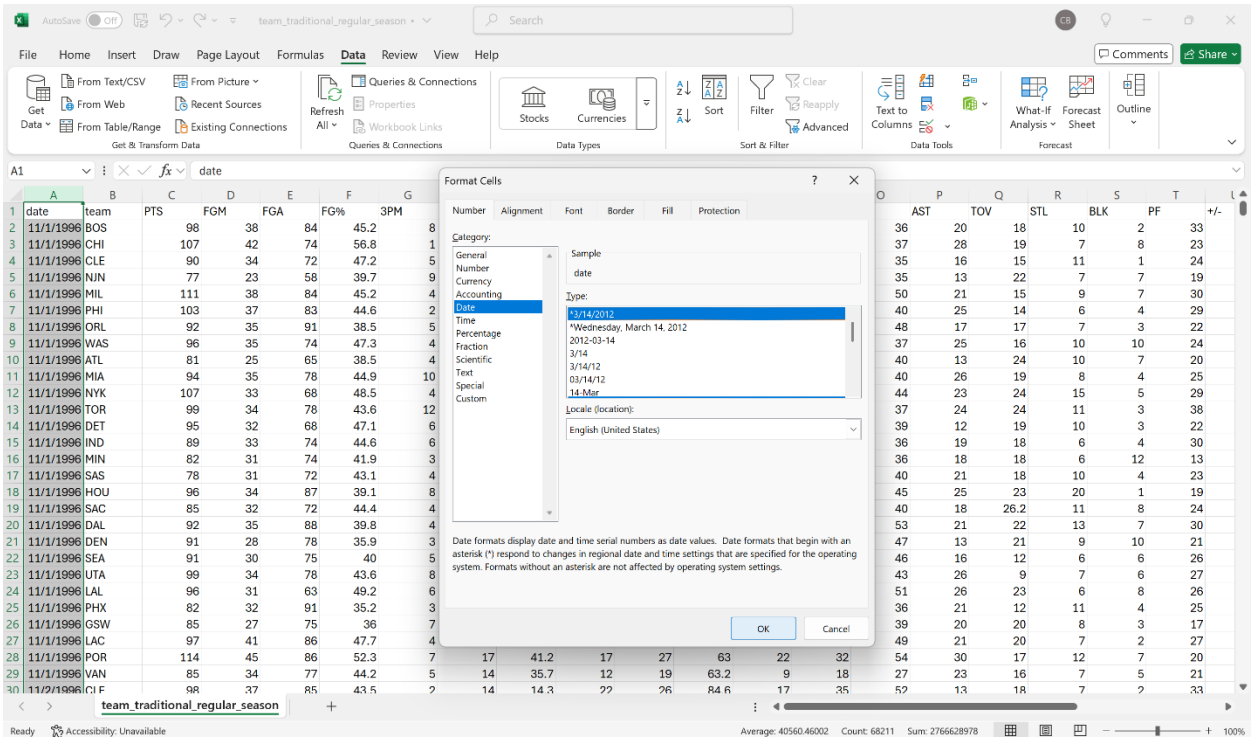
Filtered the dataset to include only regular season games, removing playoff games to ensure a consistent basis for team comparison. (Shown above)



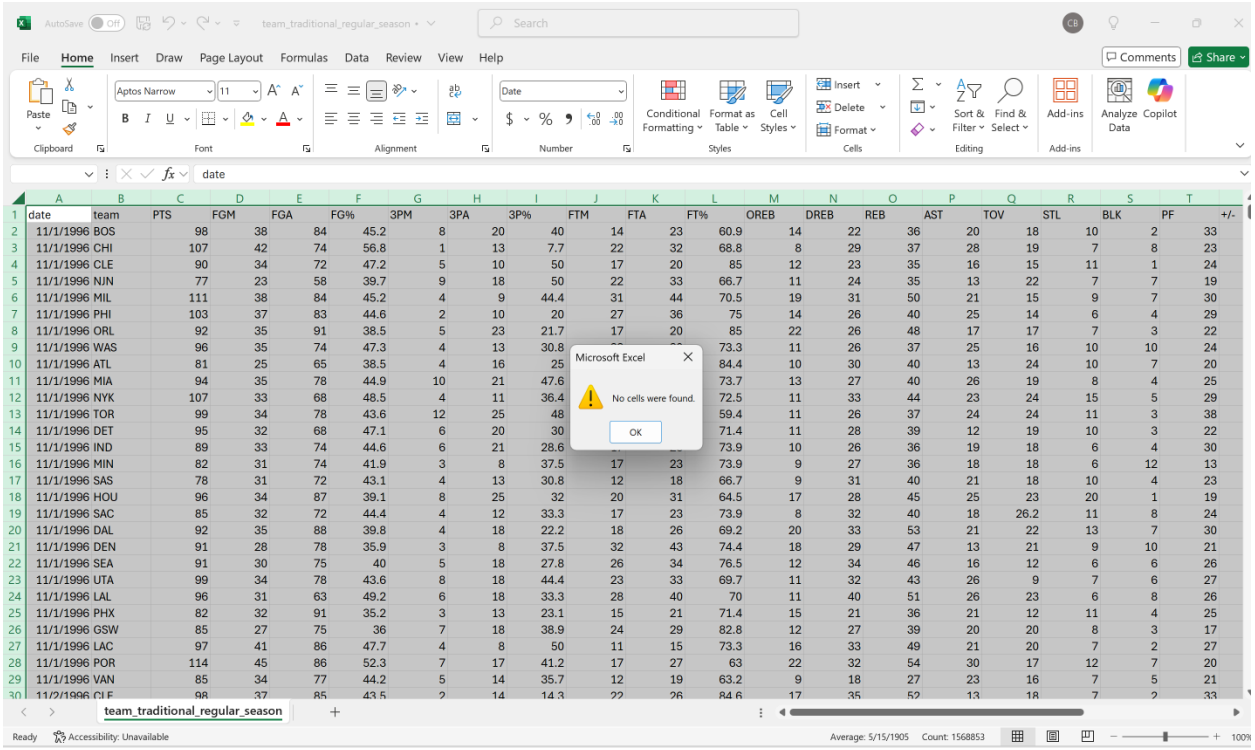
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	date	team	PTS	FGM	FGA	FG%	3PM	3PA	3P%	FTM	FTA	FT%	OREB	DREB	REB	AST	TOV	STL	BLK	PF	+/-
2	11/1/1996	BOS	98	38	84	45.2	8	20	40	14	23	60.9	14	22	36	20	18	10	2	33	
3	11/1/1996	CHI	107	42	74	56.8	1	13	7.7	22	32	68.8	8	29	37	28	19	7	8	23	
4	11/1/1996	CLE	90	34	72	47.2	5	10	50	17	20	85	12	23	35	16	15	11	1	24	
5	11/1/1996	NJN	77	23	58	39.7	9	18	50	22	33	66.7	11	24	35	13	22	7	7	19	
6	11/1/1996	MIL	111	38	84	45.2	4	9	44.4	31	44	70.5	19	31	50	21	15	9	7	30	
7	11/1/1996	PHI	103	37	83	44.6	2	10	20	27	36	75	14	26	40	25	14	6	4	29	
8	11/1/1996	ORL	92	35	91	38.5	5	23	21.7	17	20	85	22	26	48	17	17	7	3	22	
9	11/1/1996	WAS	96	35	74	47.3	4	13	30.8	22	30	73.3	11	26	37	25	16	10	10	24	
10	11/1/1996	ATL	81	25	65	38.5	4	16	25	27	32	84.4	10	30	40	13	24	10	7	20	
11	11/1/1996	MIA	94	35	78	44.9	10	21	47.6	14	19	73.7	13	27	40	26	19	8	4	25	
12	11/1/1996	NYK	107	33	68	48.5	4	11	36.4	37	51	72.5	11	33	44	23	24	15	5	29	
13	11/1/1996	TOR	99	34	78	43.6	12	25	48	19	32	59.4	11	26	37	24	24	11	3	38	
14	11/1/1996	DET	95	32	68	47.1	6	20	30	25	35	71.4	11	28	39	12	19	10	3	22	
15	11/1/1996	IND	89	33	74	44.6	6	21	28.6	17	23	73.9	10	26	36	19	18	6	4	30	
16	11/1/1996	MIN	82	31	74	41.9	3	8	37.5	17	23	73.9	9	27	36	18	18	6	12	13	
17	11/1/1996	SAS	78	31	72	43.1	4	13	30.8	12	18	66.7	9	31	40	21	18	10	4	23	
18	11/1/1996	HOU	96	34	87	39.1	8	25	32	20	31	64.5	17	28	45	25	23	20	1	19	
19	11/1/1996	SAC	85	32	72	44.4	4	12	33.3	17	23	73.9	8	32	40	18	26.2	11	8	24	
20	11/1/1996	DAL	92	35	88	39.8	4	18	22.2	18	26	69.2	20	33	53	21	22	13	7	30	
21	11/1/1996	DEN	91	28	78	35.9	3	8	37.5	32	43	74.4	18	29	47	13	21	9	10	21	
22	11/1/1996	SEA	91	30	75	40	5	18	27.8	26	34	76.5	12	34	46	16	12	6	6	26	
23	11/1/1996	UTA	99	34	78	43.6	8	18	44.4	23	33	69.7	11	32	43	26	9	7	6	27	
24	11/1/1996	LAL	96	31	63	49.2	6	18	33.3	28	40	70	11	40	51	26	23	6	8	26	
25	11/1/1996	PHX	82	32	91	35.2	3	13	23.1	15	21	71.4	15	21	36	21	12	11	4	25	
26	11/1/1996	GSW	85	27	75	36	7	18	38.9	24	29	82.8	12	27	39	20	20	8	3	17	
27	11/1/1996	LAC	97	41	86	47.7	4	8	50	11	15	73.3	16	33	49	21	20	7	2	27	
28	11/1/1996	POR	114	45	86	52.3	7	17	41.2	17	27	63	22	32	54	30	17	12	7	20	
29	11/1/1996	VAN	85	34	77	44.2	5	14	35.7	12	19	63.2	9	18	27	23	16	7	5	21	
30	11/2/1996	CLE	98	37	85	43.5	2	14	14.3	22	26	84.6	17	35	52	13	18	7	2	33	

Removed unnecessary columns such as game ID, home/away status, and type of game to focus on performance-related statistics only. (Shown above)



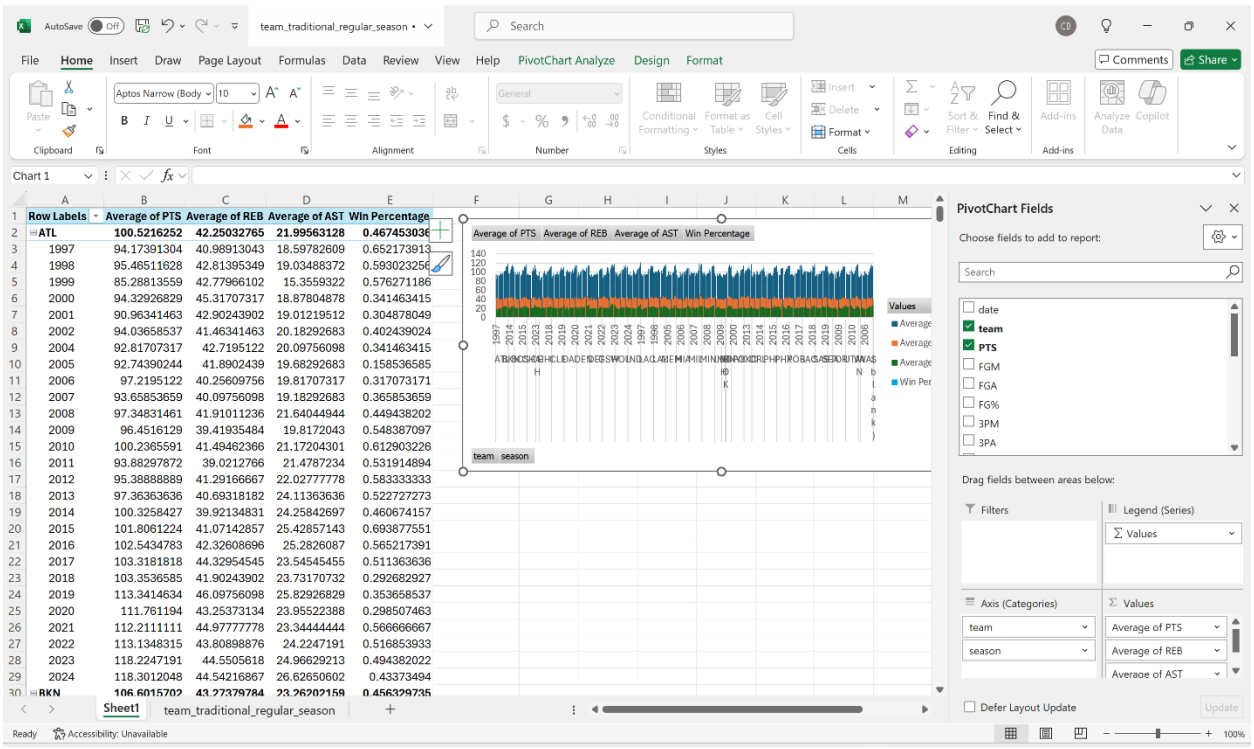


Converted the date column to proper datetime format to enable seasonal grouping and chronological analysis. (Shown above)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	date	team	PTS	FGM	FGA	FG%	3PM	3PA	3P%	FTM	FTA	FT%	OREB	DREB	REB	AST	TOV	STL	BLK	PF	+/-
2	11/1/1996	BOS	98	38	84	45.2	8	20	40	14	23	60.9	14	22	36	20	18	10	2	33	
3	11/1/1996	CHI	107	42	74	56.8	1	13	7.7	22	32	68.8	8	29	37	28	19	7	8	23	
4	11/1/1996	CLE	90	34	72	47.2	5	10	50	17	20	85	12	23	35	16	15	11	1	24	
5	11/1/1996	NJN	77	23	58	39.7	9	18	50	22	33	66.7	11	24	35	13	22	7	7	19	
6	11/1/1996	MIL	111	38	84	45.2	4	9	44.4	31	44	70.5	19	31	50	21	15	9	7	30	
7	11/1/1996	PHI	103	37	83	44.6	2	10	20	27	36	75	14	26	40	25	14	6	4	29	
8	11/1/1996	ORL	92	35	91	38.5	5	23	21.7	17	20	85	22	26	48	17	17	7	3	22	
9	11/1/1996	WAS	96	35	74	47.3	4	13	30.8			73.3	11	26	37	25	16	10	10	24	
10	11/1/1996	ATL	81	25	65	38.5	4	16	25			84.4	10	30	40	13	24	10	7	20	
11	11/1/1996	MIA	94	35	78	44.9	10	21	47.6			73.7	13	27	40	26	19	8	4	25	
12	11/1/1996	NYK	107	33	68	48.5	4	11	36.4			72.5	11	33	44	23	24	15	5	29	
13	11/1/1996	TOR	99	34	78	43.6	12	25	48			59.4	11	26	37	24	24	11	3	38	
14	11/1/1996	DET	95	32	68	47.1	6	20	30			71.4	11	28	39	12	19	10	3	22	
15	11/1/1996	IND	89	33	74	44.6	6	21	28.6			73.9	10	26	36	19	18	6	4	30	
16	11/1/1996	MIN	82	31	74	41.9	3	8	37.5	17	23	73.9	9	27	36	18	18	6	12	13	
17	11/1/1996	SAS	78	31	72	43.1	4	13	30.8	12	18	66.7	9	31	40	21	18	10	4	23	
18	11/1/1996	HOU	96	34	87	39.1	8	25	32	20	31	64.5	17	28	45	25	23	20	1	19	
19	11/1/1996	SAC	85	32	72	44.4	4	12	33.3	17	23	73.9	8	32	40	18	26.2	11	8	24	
20	11/1/1996	DAL	92	35	88	39.8	4	18	22.2	18	26	69.2	20	33	53	21	22	13	7	30	
21	11/1/1996	DEN	91	28	78	35.9	3	8	37.5	32	43	74.4	18	29	47	13	21	9	10	21	
22	11/1/1996	SEA	91	30	75	40	5	18	27.8	26	34	76.5	12	34	46	16	12	6	6	26	
23	11/1/1996	UTA	99	34	78	43.6	8	18	44.4	23	33	69.7	11	32	43	26	9	7	6	27	
24	11/1/1996	LAL	96	31	63	49.2	6	18	33.3	28	40	70	11	40	51	26	23	6	8	26	
25	11/1/1996	PHX	82	32	91	35.2	3	13	23.1	15	21	71.4	15	21	36	21	12	11	4	25	
26	11/1/1996	GSW	85	27	75	36	7	18	38.9	24	29	82.8	12	27	39	20	20	8	3	17	
27	11/1/1996	LAC	97	41	86	47.7	4	8	50	11	15	73.3	16	33	49	21	20	7	2	27	
28	11/1/1996	POR	114	45	86	52.3	7	17	41.2	17	27	63	22	32	54	30	17	12	7	20	
29	11/1/1996	VAN	85	34	77	44.2	5	14	35.7	12	19	63.2	9	18	27	23	16	7	5	21	
30	11/2/1996	CLE	98	37	85	43.5	2	14	14.3	22	26	84.6	17	35	52	13	18	7	2	33	

Checked the dataset for missing values and duplicates. No data quality issues were found. (shown above)

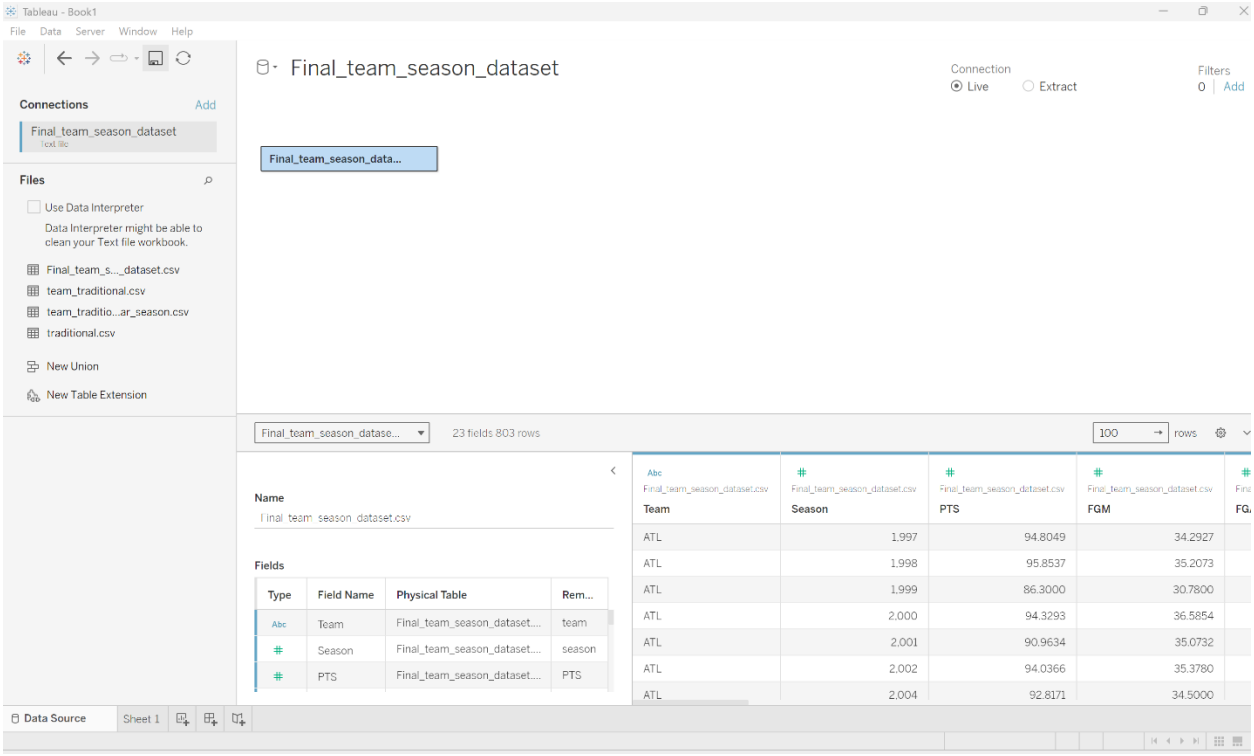


Grouped the dataset by team and season to calculate average statistics per season, transforming the data into a team-season level format. (shown above).

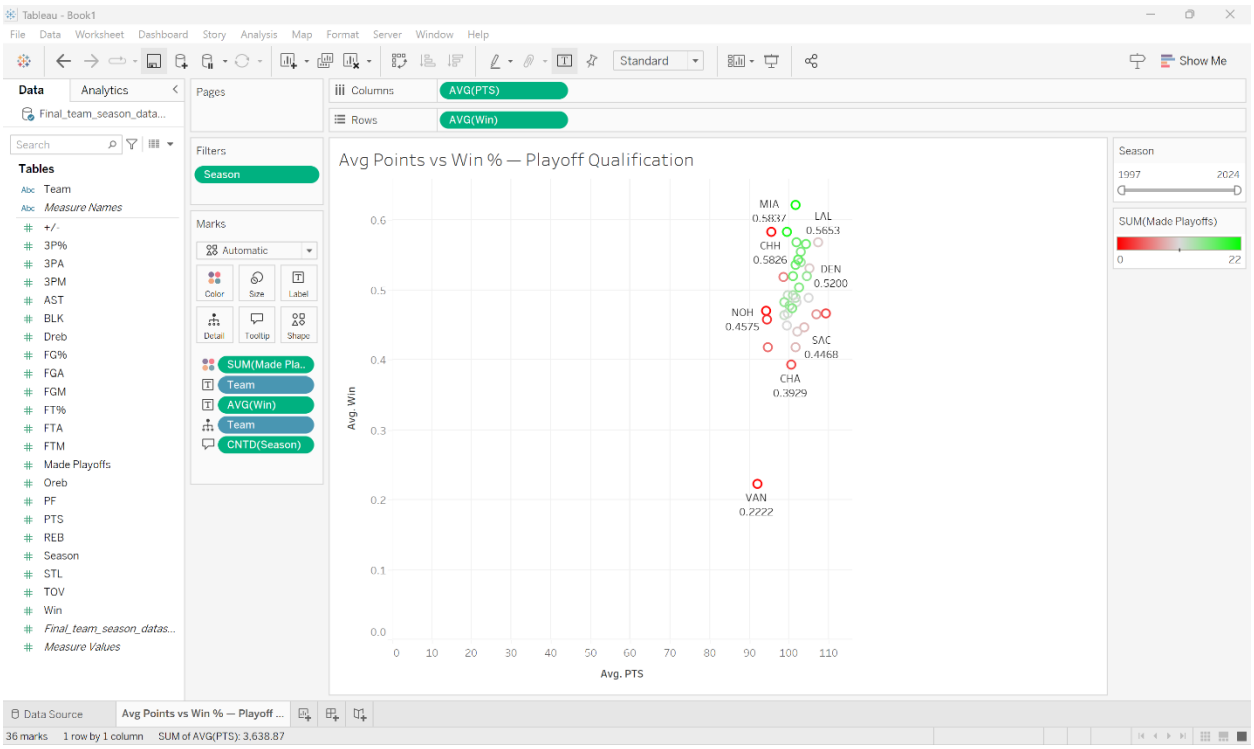
Also manually added a ‘made playoffs’ column for each team-season using historical playoff data from Basketball Reference. This served as the target variable for later analysis.

Data Analysis & Visualizations

With the dataset cleaned and labeled, I transitioned to Tableau for visual exploration and analysis. I created three key visualizations that helped uncover patterns in team performance and how those patterns relate to playoff qualification. Each chart focused on a different aspect of performance — scoring, team play, and efficiency — and compared playoff vs non-playoff teams across seasons.

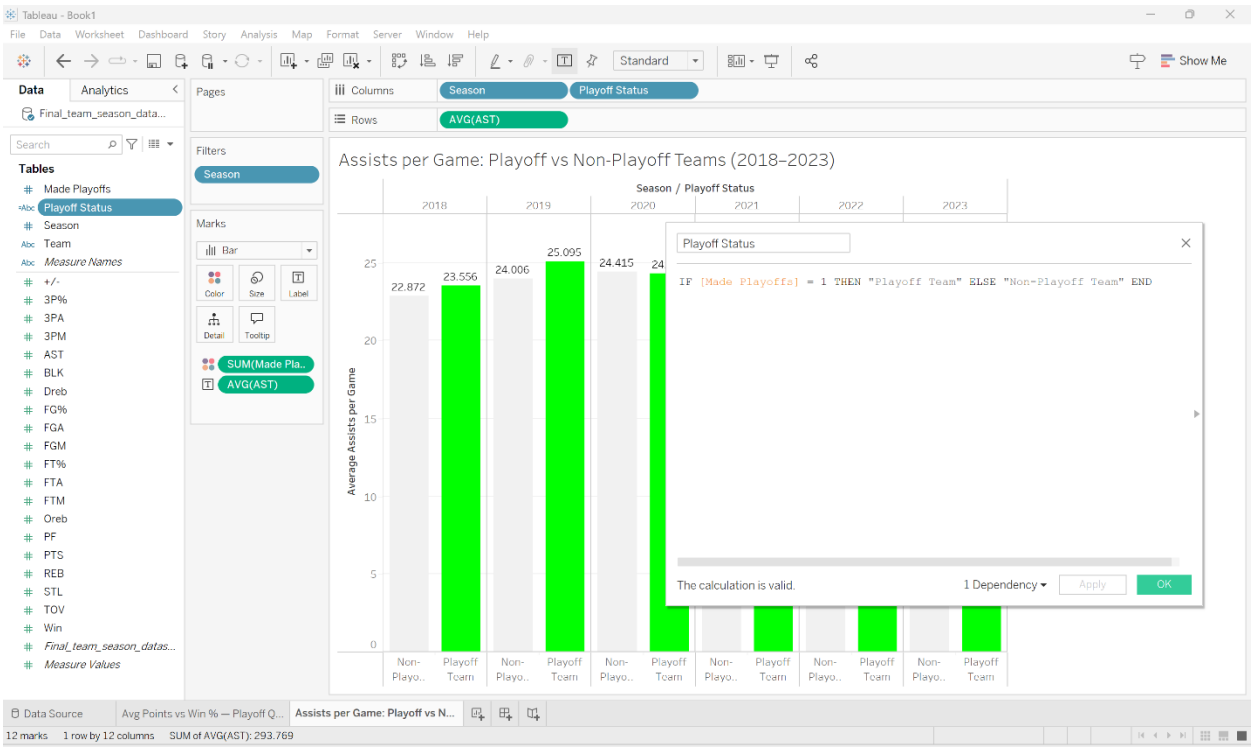


Loading the dataset into Tableau. Once loaded, I began building visualizations to explore key statistical relationships between team performance and playoff success. (Shown above)

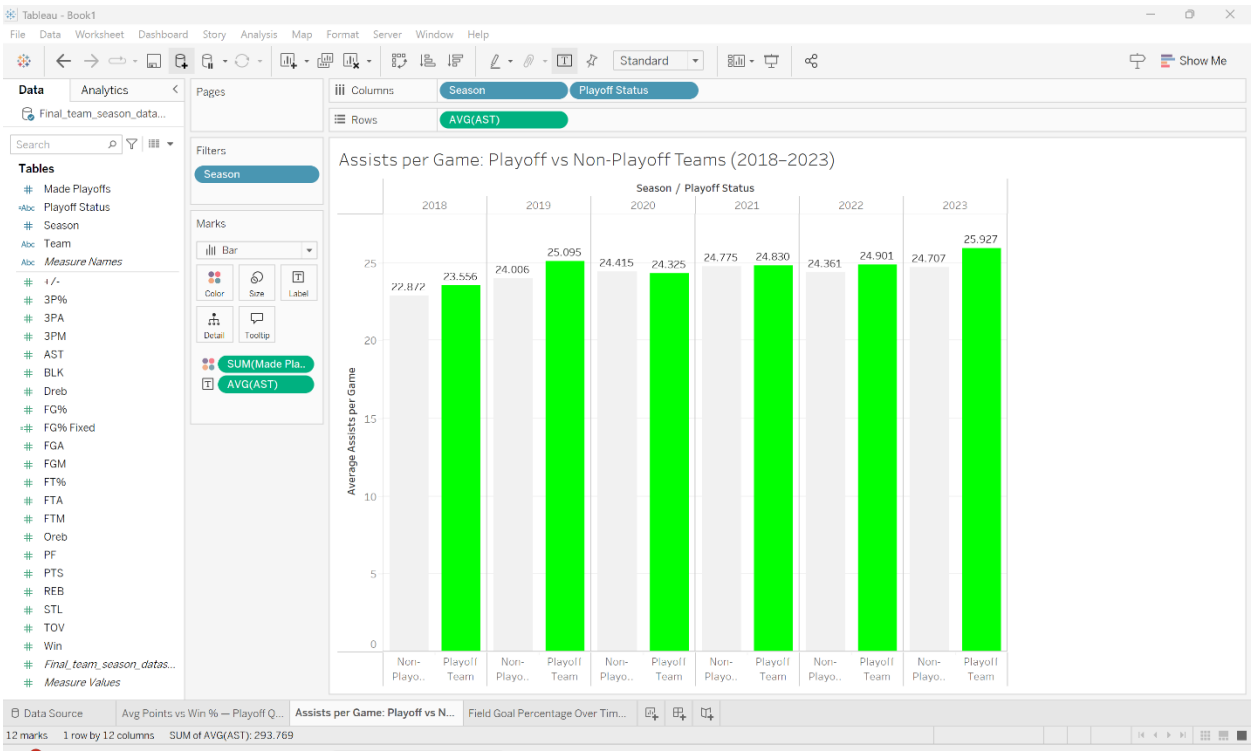


Visualization 1: Avg Points vs Win Percentage (Scatterplot)

Scatterplot comparing average points per game to win percentage, colored by playoff qualification. While higher points often align with more wins, not all high-scoring teams made the playoffs — indicating that scoring alone is not a guaranteed predictor. (shown above)

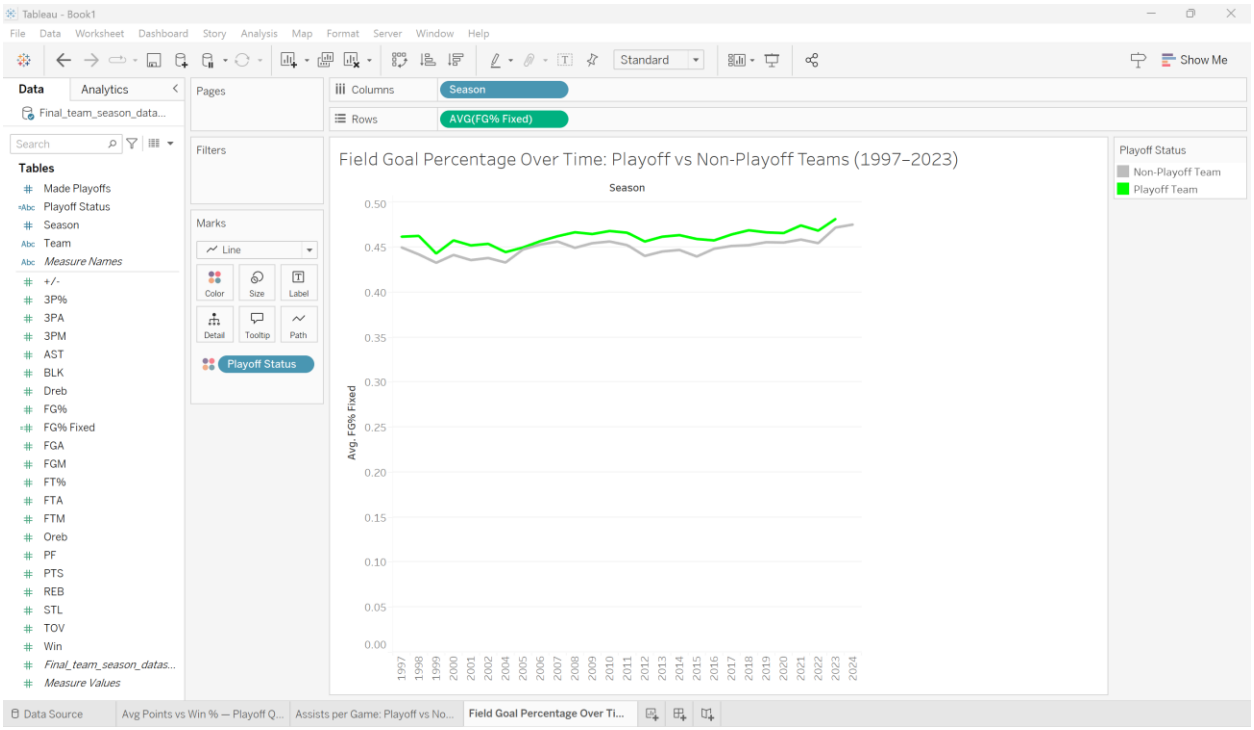


Created a calculated field determining if a team made the playoffs (using the column Made Playoffs from earlier) (shown above)



Visualization 2: Assists per Game — Playoff vs Non-Playoff Teams (Bar Chart)

Bar chart showing average assists per game from 2018 to 2023, split by playoff status. Playoff teams consistently average more assists, highlighting the role of ball movement and team coordination in postseason success. (shown above)



Visualization 3: Field Goal Percentage Over Time (Line Chart)

Line chart showing average field goal percentage for playoff vs non-playoff teams from 1997 to 2023. Playoff teams have maintained a higher and more consistent shooting efficiency across seasons. (Shown above)

Insights & Conclusion

This project highlighted several key trends that help differentiate playoff teams from non-playoff teams. While scoring is important, it isn't the sole factor. Playoff teams consistently show higher assist rates and better field goal percentages — pointing to the importance of team play and offensive efficiency. These findings align with the modern NBA's emphasis on ball movement and shot selection. "Space and pace", as they like to call it now. Gone are the days of using up most of the clock to get a good shot but rather the ball movement and improvements in player talent and shooting ability has seen percentages increase over the years.

In the future, I'd like to expand this project by incorporating more advanced metrics (like offensive/defensive ratings or pace), player-level data, and even predictive models to forecast playoff outcomes. This version served as a foundation for building a repeatable analysis pipeline and refining my skills in data cleaning, visualization, and storytelling with data.

As a basketball fan and aspiring analyst, this project was a great opportunity to combine my passion with practical data skills — and it's just the beginning.