

Crickonomics: The Moneyball Strategy for IPL

*Raipur Raiders Road to
finals*





KEEGAN NUNES

SHASHVATH ARUN

SHREY AGARWAL

SHITIZ GUPTA

OUR TEAM

Our team consists of diverse individuals united by a common goal to create and develop a successful team.

TABLE OF CONTENTS



1. INTRODUCTION

2. FLOW OF THE PROJECT

3. AIM

4. PLAYER RATINGS

5. PRICE ESTIMATION

6. PRE-SIGNING OF PLAYERS

7. FINAL TEAM

8. MONTE CARLO SIMULATION

9. CONCLUSION/LIMITATIONS

10. FUTURE SCOPE

INTRODUCTION



This project applies data analytics to the Indian Premier League (IPL) to evaluate whether data-driven insights can outperform intuition in team selection. Inspired by the Moneyball approach, it uses objective player statistics to identify undervalued talent and optimize team performance. The study demonstrates how analytics can enable smarter, fairer, and more cost-efficient decision-making in cricket.

IPL POINT SYSTEM

- Win = 2 points
- No result / Abandoned match = 1 point each
- Loss = 0 points
- Teams are ranked by total points, and if tied, Net Run Rate (NRR) decides the position.
- Each team plays 14 matches in the league stage, 7 at home and 7 away.
- Every win gives 2 points, and the top 4 teams on the points table advance to the playoffs.
- Playoffs include Qualifier 1, Eliminator, Qualifier 2, and then the Final.
- The winner of the Final becomes the IPL Champion for that season.



CONSTRAINTS OF THE IPL TEAMS

- Budget cap: Teams have a total budget to build their squad.
- Squad size: A minimum of 18 and a maximum of 25 players must be on the squad.
- Overseas players: A team can have a maximum of 8 overseas players.
- Impact Player rule: Captains can name five substitutes before the match, one of whom can be swapped with a player from the starting XI at any point during the game.
- There can only be 4 overseas players in the playing XI squad.



FLOW OF THE PROJECT

Collected Data of over 300 players from Statsguru and IPL official website for 3 datasets

Data Cleaning and Pre-processing

Calculated Player ratings with the help of their performance stats, using statistical methods.

Replaced Least performing IPL team and Pre signed players from them

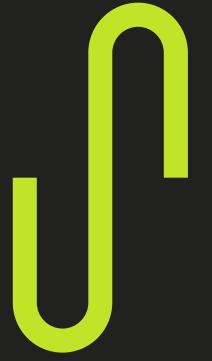
Predicted the prices of the players using Machine learning and made a low budget team

Created a team by choosing the top players

Used Monte Carlo simulations to conduct 10,00,000 simulations to find out how our team performs in the IPL season

Results and Conclusion

AIM



The primary aim of this project is to apply data-driven analysis and statistical modeling to build a competitive and cost-effective Indian Premier League (IPL) team inspired by the Moneyball approach.

The project involves creating our own statistically optimized team to replace the least-performing franchise from the previous season. Using Monte Carlo simulations, we test whether our data-driven team can outperform existing teams and achieve consistent, match-winning performance within a lower budget.

METHODOLOGY



1. Player Rating
2. Price Estimation
3. Monte Carlo Simulation

DATASETS USED

2025 SEASON



1. Unsold Player data
2. Sold Player data
3. All Team data

PLAYER RATINGS



Unsold Players Dataset

Adil Rashid	127	42	16	245	21*	9.42	223	109.86	0	0	7	25	6	120	426	3286	131	25.08	7.71	19.5	3.0	29	29	0	0	29	0.228	
Akeal Hosein	176	88	33	822	55*	14.94	738	111.38	0	1	10	48	38	172	3700	4480	179	25.02	7.26	20.6	4.1	34	34	0	0	34	0.196	
Alex Carey	12	11	0	245	65	22.27	172	142.44	0	2	0	27	6									10	6	4	6	0	0.909	
Alick Athanaze	35	32	5	663	76	24.55	566	117.13	0	2	1	52	29									15	15	0	0	15	0.428	
Alzarri Joseph	130	55	26	363	29*	12.51	337	107.71	0	0	11	25	18	126	458	5	4009	159	25.21	8.75	17.2	4.1	39	39	0	0	39	0.309
Andre Fletcher	85	81	6	2421	118	32.28	1748	138.5	3	15	10	214	123	2	17		24	1	24	8.47	17	0.0	37	34	3	16	18	0.435
Ashton Agar	44	27	11	263	51*	16.43	198	132.82	0	1	4	9	18	44	924	3	1155	27	42.77	7.5	34.2	0.0	22	22	0	0	22	0.5
Ashton Turner	96	88	28	1773	84*	29.55	1230	144.14	0	7	5	142	55	33	310	0	420	62	38.18	8.12	28.1	0.0	45	45	0	0	45	0.469
Ben Duckett	71	71	11	1978	92	32.96	1310	150.99	0	12	5	247	44	0	0		0	0	0	0	0	0	38	38	0	0	38	0.558
Ben Dwarshuis	48	34	14	342	40*	17.1	216	158.33	0	0	8	17	23	48	1010		1361	62	21.95	8.08	16.2	2.1						0.000
Bhanuka Rajapaksa	94	89	10	1653	88	20.92	1210	136.61	0	6	7	148	80						23	23	0	1	22	0.25				
Blessing Muzarabani	74	19	8	27	9*	2.45	47	57.44	0	0	5	2	1	71	1500	8	1708	82	20.82	6.87	18.1	0.0	11	11	0	0	11	0.152
Brandon King	75	72	5	1714	98*	25.58	1242	138	0	12	7	177	90						27	27	0	0	27	0.369				
Charith Asalanka	82	80	7	1586	74	21.72	1226	129.36	0	8	6	109	81	22	230	0	308	10	30.8	8	23.1	0.0	23	23	0	0	23	0.283
Chetan Sakaria	8	2	1	4	4	4	6	66.66	0	0	0	1	0	8	186	0	257	14	18.35	8.29	13.2	1.0	3	3	0	0	3	0.375
Chris Benjamin	41	37	7	395	46	13.16	322	122.67	0	0	6	34	12						19	18	1	8	10	0.463				
Chris Green	101	76	26	963	48	19.26	673	143.09	0	0	2	67	37	100	2156	2563	113	22.68	7.13	19	4.0							
Chris Jordan	155	104	48	1168	73	20.85	804	145.27	0	3	5	80	65	151	502	4372	167	26.17	8.7	18	5.0	73	73	0	0	73	0.47	
Cooper Connolly	27	22	7	577	66	38.46	422	136.72	0	2	2	36	28	19	252	0	314	12	26.16	7.47	21	0.0	9	9	0	0	9	0.346
Dan Lawrence	78	74	5	1627	120*	23.57	1126	144.49	1	9	7	152	59	40	486	680	25	27.2	8.39	19.4	1.0	31	31	0	1	30	0.397	
Daniel Worrall	50	14	10	19	6	4.75	37	51.35	0	0	1	0	0	50	948	1156	50	23.12	7.31	18.9	0.0	10	10	0	0	10	0.200	
Daryl Mitchell	115	107	21	2651	85*	30.82	1904	139.23	0	16	3	182	97	37	447	732	24	30.5	9.82	18.6	0.0	63	63	0	0	63	0.562	
Dasun Shanaka	102	91	23	1464	63*	21.52	1020	143.52	0	4	11	115	79	59	720	1	1058	53	19.96	8.85	13.5	1.0	43	43	0	0	43	0.43
David Payne	92	39	15	214	28	8.91	172	124.41	0	0	6	8	13	90	1940	2426	121	20.04	7.5	16	3.0	26	26	0	0	26	0.283	
David Warner	96	96	7	2725	93*	30.61	2002	136.11	0	22	7	319	73	0	0		0	0	0	0	0	44	44	0	0	44	0.463	
Dewald Brevis	80	75	9	2025	162	30.68	1263	160.33	2	11	7	127	153	16	31		233	12	19.41	7.51	15.5	0.0	44	44	0	0	44	0.550
Dilshan Madushanka	45	14	6	25	12	3.12	50	50	0	0	4	1	1	45	890	0	1401	39	35.92	9.42	22.8	0.0	8	8	0	0	8	0.177
Dunith Wellalage	71	44	12	564	45	17.62	538	104.83	0	0	1	55	11	64	1262.4	1	1492	66	22.6	7.08	19.1	2.0	29	29	0	0	29	0.426
Dushman Hemantha	32	21	4	241	34	14.17	196	122.95	0	0	1	10	14	29	590	1	616	48	12.83	6.24	12.3	2.1	12	12	0	0	12	0.4
Dwaine Pretorius	95	66	22	715	48	16.25	545	131.19	0	0	7	54	36	88	1792	2566	111	23.11	8.59	16.1	3.0	25	25	0	0	25	0.268	
Evin Lewis	66	63	6	1247	100*	21.87	910	137.03	1	5	4	106	85	0	0	0	0	0	0	0	0	0	21	21	0	0	21	0.328
Finn Allen	110	108	3	2878	151	27.4	1665	172.85	4	15	9	242	206	0	0		0	0	0	0	0	55	54	1	7	47	0.509	
Gudakesh Motie	74	32	13	266	33*	14	216	123.14	0	0	3	15	18	71	1435.8	3	1807	78	23.16	7.54	18.4	1.0	20	20	0	0	20	0.277
Gus Atkinson	41	18	11	59	10*	8.42	70	84.28	0	0	1	3	1	40	126.5		1151	50	23.02	9.09	15.1	1.0	11	11	0	0	11	0.26

ALGORITHMS



1. Recursive Feature Elimination (RFE)

- A supervised learning method that selects features based on model performance.
- Helps identify the most relevant variables but has limitations with correlated data.

2. PCA on Primary Statistics

- Used to overcome RFE's limitations and handle multicollinearity.
- Transforms correlated variables into uncorrelated principal components.
- Feature weights derived from the first principal component (PC1).
- Applied separately to 118 batsmen and 96 bowlers using their core performance stats.

3. PCA on Engineered Features

- Introduces domain-specific, composite features (e.g., strike impact, economy efficiency).
- Integrates cricket knowledge to create meaningful T20 performance metrics.
- PCA applied to this enhanced feature space for better interpretability and representation.

ENGINEERED FEATURES AND WEIGHTS

Role	Feature	Formula	PCA Weight
Batting	Hard Hitter	(Fours*4 + Sixes*6) / Balls_faced	0.167 (16.7%)
	Finisher	NO / Bat_inns	0.158 (15.8%)
	Fast Scorer	Strike Rate	0.173 (17.3%)
	Consistent	Batting Average	0.166 (16.6%)
	Boundary Frequency	(Fours + Sixes) / Balls_faced	0.168 (16.8%)
	Innings Builder	Runs_scored / Bat_inns	0.169 (16.9%)
Bowling	Economy	Econ (The raw economy rate)	0.173 (17.3%)
	Wicket Taker	1 / Bowling Avg	0.155 (15.5%)
	Strike Bowler	1 / Bowl_sr	0.193 (19.3%)
	Pressure Builder	1 / Econ	0.173 (17.3%)
	Consistent Bowler	Wickets / Bowl_inns	0.183 (18.3%)
	Big Wicket Potential	(4 + 5) / Bowl_inns	0.122 (12.2%)
Fielding	Dismissals Per Inning	Dismissal / Matches	0.588 (58.8%)
	Wicket Keeping Bonus	Stumps / Matches (for wicket-keepers)	0.412 (41.2%)

*Reference : “A New Machine Learning Based Deep Performance Index For Ranking IPL T20 Cricketers” By *C. Deep Prakash, C. Patvardhan, Sushobhit Singh* Published International Journal of Computer Applications

WHY PCA ON ENGINEERED FEATURES WAS CHOSEN?

PCA on primary statistics Vs PCA on engineered features

```
=====
PCA COMPARISON: BATTING
=====

Variance Explained by 1st PC:
    Primary Features: 79.1%
    Engineered Features: 80.0%
    Difference: +0.9%
```

```
=====
PCA COMPARISON: BOWLING
=====

Variance Explained by 1st PC:
    Primary Features: 52.9%
    Engineered Features: 71.3%
    Difference: +18.4%
```

PCA on primary statistics suffered from significant multicollinearity and poorly fitted a model to bowling performance

RFE Vs PCA on engineered features

```
BATTING FEATURE IMPORTANCE:
What contributes most to being a good batsman?
=====

runs_scored      → 46.7% importance
Sixes            → 18.3% importance
Fours            → 14.3% importance
Fifties           → 13.2% importance
balls_faced      → 2.8% importance
NO               → 2.1% importance
hundred          → 1.4% importance
Zero              → 1.2% importance
```

```
BOWLING FEATURE IMPORTANCE:
What contributes most to being a good bowler?
=====

wickets          → 44.7% importance
Runs_against     → 22.3% importance
Balls            → 13.7% importance
4                → 13.1% importance
Mdns             → 4.6% importance
5                → 1.6% importance
```

Unlike the RFE method, which tends to overvalue cumulative stats like total runs or wickets, the PCA with engineered features focuses on effectiveness and impact through measures such as *Hard-Hitter* and *Finisher*.

RESULTS

International Player ratings & Statistical Description

Rank	Player	Overall	Batting	Bowling	Fielding	Role
1	Daryl Mitchell	8.32	8.42	9.2	4.29	All-rounder
2	Matthew Short	8.2	9.35	7.66	4.62	All-rounder
3	Dewald Brevis	8.15	9.56	7.35	4.31	All-rounder
4	Ashton Turner	8.09	8.39	8.85	3.57	All-rounder
5	K.S Bharat	8.08	8.68	0.0	10.0	Batter
6	Tom Curran	7.92	8.59	8.74	1.27	All-rounder
7	Jimmy Neesham	7.83	7.79	8.93	3.64	All-rounder
8	Jason Holder	7.82	7.75	8.95	3.61	All-rounder
9	Keemo Paul	7.8	6.87	10.0	3.61	All-rounder
10	Finn Allen	7.78	10.0	0.0	3.91	Batter
11	William Sutherland	7.73	8.12	8.0	4.66	All-rounder
12	Wiaan Mulder	7.69	7.94	8.39	3.64	All-rounder
13	Dasun Shanaka	7.67	7.81	8.64	3.14	All-rounder
14	Chris Jordan	7.65	7.64	8.69	3.59	All-rounder
15	Tymal Mills	7.6	4.7	9.4	0.79	Bowler
16	Dan Lawrence	7.59	8.21	7.98	2.92	All-rounder
17	Johnson Charles	7.59	8.92	7.57	2.96	Batter
18	Andre Fletcher	7.58	8.7	7.93	3.49	Batter
19	Michael Bracewell	7.52	7.49	8.34	4.39	All-rounder
20	Matthew Forde	7.52	7.6	8.63	2.74	All-rounder
21	Tim Seifert	7.5	8.86	0.0	6.49	Batter
22	Cooper Connolly	7.47	8.73	7.19	2.33	All-rounder
23	Alex Carey	7.45	8.07	0.0	9.04	Batter
24	Rilee Rossouw	7.42	9.14	4.19	3.03	Batter
25	James Vince	7.41	9.0	0.0	5.58	Batter

Total Players: 119

Rating Ranges (0-10 Scale):

Overall: Min=3.29, Max=8.32, Mean=6.72

Batting: Min=0.00, Max=10.00, Mean=6.33

Bowling: Min=0.00, Max=10.00, Mean=5.88

Fielding: Min=0.00, Max=10.00, Mean=2.97

National Player ratings & Statistical Description

Rank	Player	Overall	Batting	Bowling	Fielding	Role
1	Anmolpreet Singh	8.12	10.0	0.0	5.58	Batter
2	Krishnappa Gowtham	7.15	7.59	10.0	4.17	Batter
3	K.S Bharat	7.13	7.33	0.0	10.0	Batter
4	Prithvi Shaw	6.89	9.06	0.0	2.74	Batter
5	Utkarsh Singh	6.56	8.32	1.97	2.71	Batter
6	Yash Dhull	5.89	7.52	1.51	2.37	Batter
7	Mayank Agarwal	5.19	5.77	0.0	5.76	Batter
8	Devdutt Padikkal	4.48	5.41	0.0	3.45	Batter
9	Luvnith Sisodia	3.97	3.07	0.0	9.12	Batter
10	Shardul Thakur	3.58	4.7	3.29	3.31	Bowler
11	SN Khan	3.41	3.72	0.0	4.06	Batter
12	Shivam Mavi	3.35	5.22	2.77	3.72	Bowler
13	Umesh Yadav	2.72	1.71	2.96	3.09	Bowler
14	Piyush Chawla	2.29	0.93	2.81	1.39	Bowler
15	Kartik Tyagi	0.64	0.0	6.43	0.0	Batter

Total Players: 15

Rating Ranges (0-10 Scale):

Overall: Min=0.64, Max=8.12, Mean=4.76

Batting: Min=0.00, Max=10.00, Mean=5.36

Bowling: Min=0.00, Max=10.00, Mean=2.12

Fielding: Min=0.00, Max=10.00, Mean=4.10

Ratings = Scores(Calculated) x Weights(PCA)

Normalized using Min-Max scaling

DRAFT 1 OF OUR TEAM - RAIPUR RAIDERS

	Player Name	Role
1	Devdutt Padikkal	Batter
2	Prithvi Shaw	Batter
3	Mayank Agarwal	Batter
4	Anmolpreet Singh	Batter
5	Daryl Mitchell	All-Rounder
6	K.S Bharat	Wicket-Keeper
7	Dewald Brevis	Batter
8	Shardul Thakur	Bowler
9	Krishnappa Gowtham	Bowler
10	Ashton Turner	All-Rounder
11	Tom Curran	All-Rounder
12	Utkarsh Singh	Bowler
13	Yash Dhull	Batter
14	Luvnith Sisodia	Wicket-Keeper
15	Matthew Short	Batter
16	Jimmy Neesham	Bowler
17	Keemo Paul	Bowler



PRICE ESTIMATION

Sold Players Dataset

Player	Mat	Runs	HS	Bat Av	100	Wkts	Bowl Av	5	Ct	St	Ave Diff	Base Price	Selling price
Anshul Kamboj	29	65	17	16.25	0	33	20.24	0	10	0	-3.99	₹ 30,00,000	₹ 3,40,00,000
Deepak Hooda	51	692	65	17.3	0	8	23.12	0	23	0	-5.82	₹ 75,00,000	₹ 1,70,00,000
Devon Conway	84	2278	92*	33.01	0	-	-	-	38	7	-	₹ 2,00,00,000	₹ 6,25,00,000
Gurjapneet Singh	9	7*	4.5	0	9	0	0	0	0	0	-14.05	₹ 30,00,000	₹ 2,20,00,000
Jamie Overton	96	1124	83*	22.93	0	66	24.66	0	49	0	-1.72	₹ 1,50,00,000	₹ 1,50,00,000
Kamlesh Nagar	7	15	13	5	0	10	18.1	0	2	0	-13.09	₹ 30,00,000	₹ 30,00,000
Mukesh Choudhary	9	9	6	9	0	16	18.25	0	1	0	-9.24	₹ 30,00,000	₹ 30,00,000
Nathan Ellis	97	280	40	12.17	0	118	23.89	0	28	0	-11.72	₹ 1,25,00,000	₹ 2,00,00,000

Features

Data Available : 171 Players

Range of Selling Price : ₹30,00,000 - ₹27,00,00,000

Mean :

₹ 3,62,47,058.8

Source :

Price - Official IPL Website

Stats - statsguru.com

Column	Description
Mat	Number of matches a player has played
Runs	Total runs scored by the player
HS	Highest individual score achieved
Bat Av	Average runs scored per dismissal
100	Number of centuries
Wkts	Total wickets taken by the player
Bowl Av	Average runs conceded per wicket taken
5	Number of five-wicket hauls taken
Ct	Number of catches taken by the player
St	Number of stumpings
Ave Diff	Difference between batting and bowling averages
Base Price	Initial auction price set for player
Selling Price	Final auction purchase price

ALGORITHMS USED

1. Extreme Gradient Boosting (XGBoost)

- Advanced gradient boosting optimized for speed and performance
- Sequential tree building where each tree corrects previous errors
- High performance with built-in regularization which prevents overfitting

2. Random Forest Regressor

- Ensemble method that builds multiple decision trees and averages their predictions for robust predictions
- Robust against overfitting, handles complex feature relationships well

3. K-Nearest Neighbours (KNN)

- Finds most similar players and averages their prices
- Predicts prices based on most similar historical player profiles
- Simple distance-based approach, good baseline for comparison

COMPARISON

FINAL COMPARISON		
Model	R ² Score	RMSE
XGBoost	0.4486	₹15,806,301.64
KNN	0.5310	₹14,577,825.24
RandomForest	0.4505	₹15,779,684.44
 BEST MODEL:	KNN (R ² : 0.5310)	

LIMITATIONS

- Vast Range of selling price (₹30,00,000 - ₹27,00,00,000) with Mean = ₹3,62,47,058.8
- Intangible Factors: Player reputation, brand value
- Missing Age/ experience
- Data of only 170 players is relatively small

TEAM PRICE

	Player Name	Role	Predicted Price
1	Devdutt Padikkal	Batter	₹ 5,42,08,226
2	Prithvi Shaw	Batter	₹ 1,19,76,736
3	Mayank Agarwal	Batter	₹ 3,85,99,829
4	Anmolpreet Singh	Batter	₹ 2,39,41,040
5	Daryl Mitchell	All-Rounder	₹ 4,49,10,976
6	K.S Bharat	Wicket-Keeper	₹ 1,21,04,808
7	Dewald Brevis	Batter	₹ 83,47,995
8	Shardul Thakur	Bowler	₹ 8,36,31,187
9	Krishnappa Gowtham	Bowler	₹ 5,54,14,217
10	Ashton Turner	All-Rounder	₹ 4,75,20,384
11	Tom Curran	All-Rounder	₹ 3,90,48,130
12	Utkarsh Singh	Bowler	₹ 45,22,789
13	Yash Dhull	Batter	₹ 96,69,612
14	Luvnith Sisodia	Wicket-Keeper	₹ 53,29,149
15	Matthew Short	Batter	₹ 1,01,32,302
16	Jimmy Neesham	Bowler	₹ 2,28,16,917
17	Keemo Paul	Bowler	₹ 3,43,16,591
Total Price =			₹ 50,64,90,888

MINIMUM BUDGET CONSTRAINT

Each IPL team has a total purse of ₹120 crore for the auction and must spend at least 75% (₹90 crore) of it. This rule ensures fair competition and balanced team building, encouraging franchises to invest wisely across all player roles.

PRE-SIGNING PROCESS

When new teams enter the IPL, they are granted a special pre-signing draft before the main auction. This process allows them to select up to three players from a pool of those not retained by existing franchises. The teams take turns picking players in a set order, with each selection made at a fixed, pre-determined price that is deducted from their total auction budget.

Pick Slot	Projected Price Brackets (2025)	2022 Price Brackets (For Reference)
1st Signing	₹20 Crore, ₹16 Crore, or ₹12 Crore	₹15 Cr, ₹11 Cr, or ₹7 Cr
2nd Signing	₹16 Crore, ₹12 Crore, or ₹8 Crore	₹11 Cr, ₹7 Cr, or ₹4 Cr
3rd Signing	₹12 Crore, ₹8 Crore, or ₹4 Crore	₹7 Cr, ₹4 Cr, or ₹2 Cr

REASONS FOR REPLACING RAJASTHAN ROYALS

1. In the 2025 season they finished 9th out of 10, winning only 4 of 14 matches, showing a steep performance drop.
 2. Their overall win-rate since inception is only about 48.5% – 116 wins in 239 matches.
 3. CSK won the IPL six times vs RR won the IPL one time
-

DIRECT SIGNINGS FOR OUR TEAM

1. Yashasvi Jaiswal - ₹ 20,00,00,000
2. Jofra Archer - ₹ 12,00,00,000
3. Rayan Parag - ₹ 12,00,00,000

FINAL PRICE

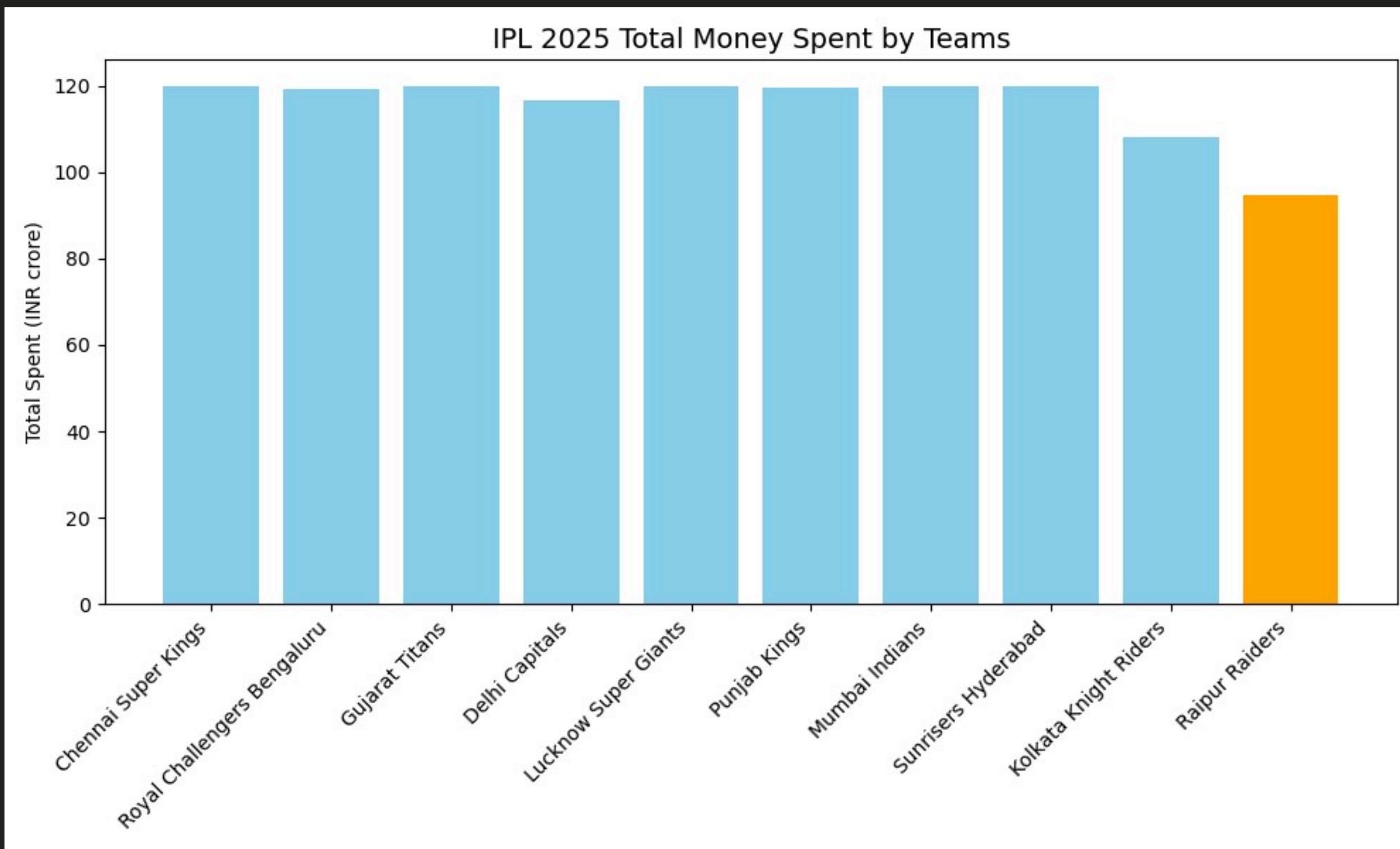
	Player Name	Role	Predicted Price
1	Devdutt Padikkal	Batter	₹ 5,42,08,226
2	Prithvi Shaw	Batter	₹ 1,19,76,736
3	Mayank Agarwal	Batter	₹ 3,85,99,829
4	Anmolpreet Singh	Batter	₹ 2,39,41,040
5	Daryl Mitchell	All-Rounder	₹ 4,49,10,976
6	K.S Bharat	Wicket-Keeper	₹ 1,21,04,808
7	Dewald Brevis	Batter	₹ 83,47,995
8	Shardul Thakur	Bowler	₹ 8,36,31,187
9	Krishnappa Gowtham	Bowler	₹ 5,54,14,217
10	Ashton Turner	All-Rounder	₹ 4,75,20,384
11	Tom Curran	All-Rounder	₹ 3,90,48,130
12	Utkarsh Singh	Bowler	₹ 45,22,789
13	Yash Dhull	Batter	₹ 96,69,612
14	Luvnith Sisodia	Wicket-Keeper	₹ 53,29,149
15	Matthew Short	Batter	₹ 1,01,32,302
16	Jimmy Neesham	Bowler	₹ 2,28,16,917
17	Keemo Paul	Bowler	₹ 3,43,16,591
18	Jofra Archer	Bowler	₹ 12,00,00,000
19	Riyan Parag	All-Rounder	₹ 12,00,00,000
20	Yashasvi jaiswal	Batter	₹ 20,00,00,000
Total Price =			₹ 94,64,90,888

PLAYING XI

RAIPUR RAIDERS PLAYING XI

Player	Role
Prithvi Shaw	Batter
Yashasvi Jaiswal	Batter
Matthew Short	Batter
Devdutt Padikkal	Batter
Riyan Parag	All-Rounder
Daryl Mitchell	All-Rounder
K.S Bharat	Wicket-Keeper
Krishnappa Gowtham	All-Rounder
Jimmy Neesham	Bowler
Jofra Archer	Bowler
Utkarsh Singh	Bowler

TEAM BUDGET COMPARISON



MONTE CARLO SIMULATION

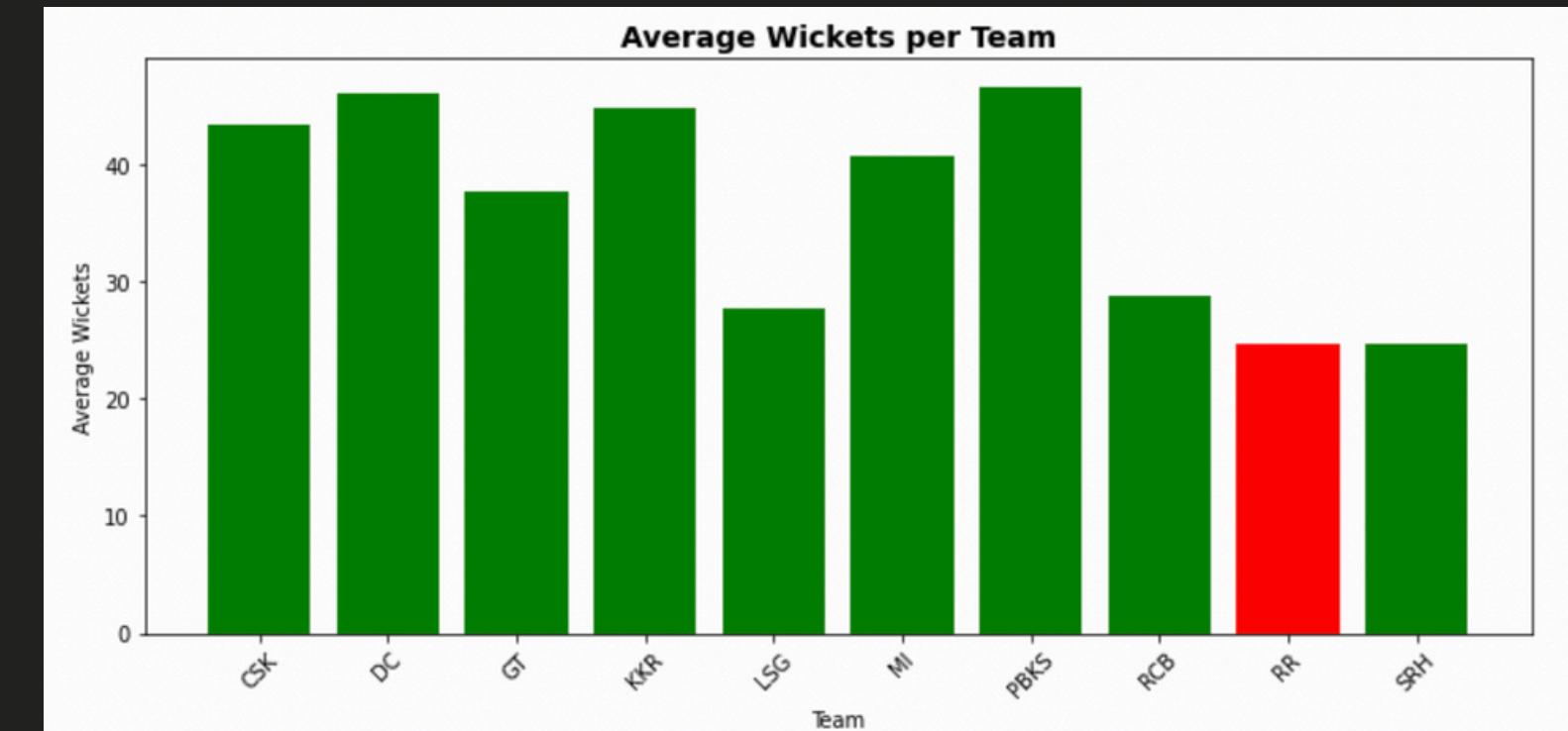
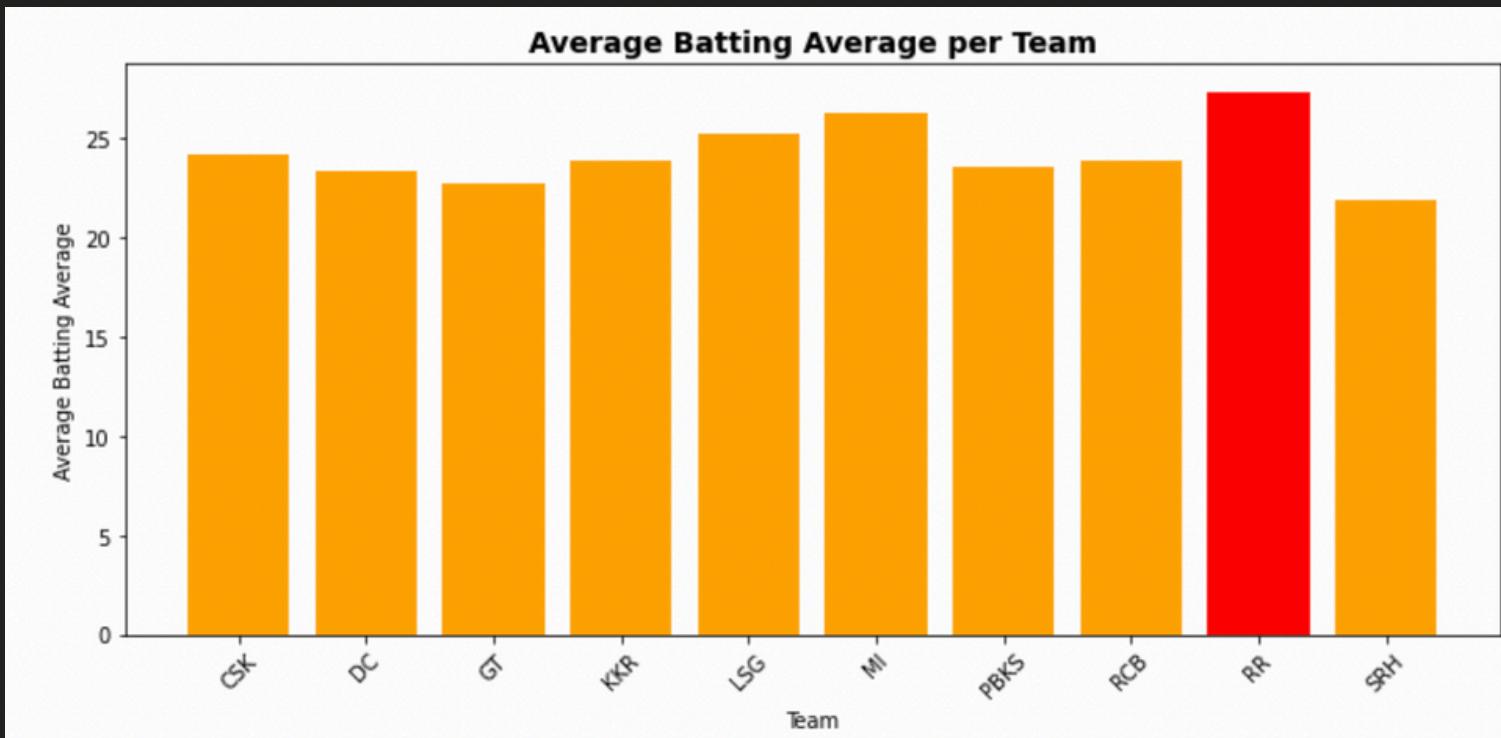
PLAYING XI

All teams dataset

CSK	DC	GT	KKR	LSG
Devon Conway	Abishek Porel	Glenn Phillips	Ajinkya Rahane	Aiden Markram
Khaleel Ahmed	Ashutosh Sharma	Jos Buttler	Andre Russell	Avesh Khan
Matheesha Pathirana	Axar Patel	Kagiso Rabada	Angkrish Raghuvanshi	Ayush Badoni
MS Dhoni	Faf Du Plessis	Mohammed Siraj	Harshit Rana	David Miller
Rachin Ravindra	Harry Brook	Prasidh Krishna	Quinton De Kock	Mayank Yadav
Rachin Ravindra	KL Rahul	Rahul Tewatia	Ramandeep Singh	Mitchell Marsh
Rahul Tripathi	Kuldeep Yadav	Rashid Khan	Rinku Singh	Mohsin Khan
Ravindra Jadeja	Mitchell Starc	Sai Sudharsan	Spencer Johnson	Nicholas Pooran
Ruturaj Gaikwad	Mukesh Kumar	Shahrukh Khan	Sunil Narine	Ravi Bishnoi
Sam Curran	T. Natarajan	Shubman Gill	Varun Chakaravarthy	Rishabh Pant
Shivam Dube	Tristan Stubbs	Washington Sundar	Venkatesh Iyer	Shahbaz Ahmed

MI	PBKS	RCB	RR	SRH
Deepak Chahar	Arshdeep Singh	Bhuvneshwar Kumar	Prithvi Shaw	Abhinav Manohar
Hardik Pandya	Azmatullah Omarzai	Jitesh Sharma	Yashasvi Jaiswal	Abhishek Sharma
Jasprit Bumrah	Harpreet Brar	Josh Hazlewood	Matthew Short	Harshal Patel
Jonny Bairstow	Josh Inglis	Krunal Pandya	Mayank Agarwal	Heinrich Klaasen
Mitchell Santner	Kyle Jamieson	Liam Livingstone	Riyan Parag	Ishan Kishan
Naman Dhir	Marcus Stoinis	Phil Salt	Daryl Mitchell	Mohammad Shami
Rohit Sharma	Nehal Wadhera	Rajat Patidar	K.S Bharat	Nitish Kumar Reddy
Suryakumar Yadav	Prabhsimran Singh	Suyash Sharma	Krishnappa Gowtham	Pat Cummins
Tilak Varma	Shashank Singh	Tim David	Jimmy Neesham	Rahul Chahar
Tim David	Shreyas Iyer	Virat Kohli	Jofra Archer	Simarjeet Singh
Trent Boult	Yuzvendra Chahal	Yash Dayal	Utkarsh Singh	Travis Head

TEAM PERFORMANCE



- This chart reflects how consistently players from each team score runs.
- RR and MI lead with higher batting averages, showcasing greater reliability among their top order, while SRH and GT rank lower, indicating inconsistency in batting performance.

- This chart highlights bowling performance by showing average wickets per player.
- DC and PBKS bowlers take the lead with higher wicket averages, signalling stronger bowling attacks.
- In contrast, RR and SRH have fewer wickets per player, showing weaker wicket-taking efficiency.

CALCULATION OF TEAM STRENGTH

$$PBS_p = \frac{\text{Bat Av}_p + \left(\frac{\text{Runs}_p}{\max(1, \text{Mat}_p)} \right)}{2}$$

$$PWS_p = \left(\frac{\text{Wkts}_p}{\max(1, \text{Mat}_p)} \right) \times \left(\frac{\kappa}{\max(\epsilon, \text{Bowl Av}_p)} \right)$$

$$PFS_p = \frac{\text{Ct}_p + \text{St}_p}{\max(1, \text{Mat}_p)}$$

$$S_{\text{team}} = w_b \cdot \text{BatScore}_{\text{team}} + w_{bw} \cdot \text{BowlScore}_{\text{team}} + w_f \cdot \text{FieldScore}_{\text{team}}$$

==== Team Strengths ==		
	Team	S_team
5	MI	169.549988
1	DC	157.624685
4	LSG	156.933712
6	PBKS	154.031939
8	RR	152.905367
7	RCB	150.315130
2	GT	149.217915
3	KKR	143.838961
9	SRH	142.783053
0	CSK	137.905315

ONE SEASON SIMULATION : GENERATING POINTS TABLE

$$P(A \text{ wins}) = \frac{S_A}{S_A + S_B}$$

A = CSK

P(A wins) = 0.55

B = KKR

P(CSK Wins) = 0 - 0.54

P(KKR Wins) = 0.55 - 0.99

Random Number between 0 - 1: 0.34

CSK WINS

POINTS TABLE
IPL 2022

	TEAMS	PLAYED	WINS	LOSS	NR	NRR	POINTS
Q	GUJARAT TITANS	14	10	4	0	+0.316	20
Q	RAJASTHAN ROYALS	14	9	5	0	+0.298	18
Q	LUCKNOW SUPER GIANTS	14	9	5	0	+0.251	18
Q	ROYAL CHALLENGERS BANGALORE	14	8	6	0	-0.253	16
E	DELHI CAPITALS	14	7	7	0	+0.204	14
E	PUNJAB KINGS	14	7	7	0	+0.126	14
E	KOLKATA KNIGHT RIDERS	14	6	8	0	+0.146	12
E	SUNRISERS HYDERABAD	14	6	8	0	-0.379	12
E	CHENNAI SUPER KINGS	14	4	10	0	-0.203	8
E	MUMBAI INDIANS	14	4	10	0	-0.506	8

AFTER MATCH 70

sportskeeda

AFTER 10,00,000 SIMULATION

PROJECTED FINAL POINTS DISTRIBUTION:				
Team	Avg	Points	Median	Mode
MI	14.9	14.0	14	
RR	14.6	14.0	14	
DC	14.2	14.0	14	
LSG	14.2	14.0	14	
PBKS	14.1	14.0	14	
RCB	13.9	14.0	14	
GT	13.8	14.0	14	
KKR	13.6	14.0	14	
SRH	13.5	14.0	14	
CSK	13.2	14.0	14	

Avg points = Total points /
1,000,000

TOP 4 QUALIFICATION PROBABILITIES:					
Team	Top 4 Count	Qualification %	Team	Top 4 Count	Qualification %
DC	493,919	49.39%	MI	475,614	47.56%
MI	475,614	47.56%	LSG	425,190	42.52%
LSG	425,190	42.52%	GT	421,948	42.19%
GT	421,948	42.19%	CSK	409,271	40.93%
CSK	409,271	40.93%	RR	395,731	39.57%
RR	395,731	39.57%	KKR	385,791	38.58%
KKR	385,791	38.58%	PBKS	379,593	37.96%
PBKS	379,593	37.96%	RCB	343,232	34.32%
RCB	343,232	34.32%	SRH	269,711	26.97%

Qual % = No. of times in top 4 /
1,000,000

PLAYOFF STAGE ADVANCEMENT PROBABILITIES:					
Team	Q1 %	Elim %	Q2 %	Final %	Win %
MI	25.39%	22.17%	23.68%	25.99%	13.73%
DC	27.33%	22.06%	24.66%	26.47%	13.44%
LSG	21.73%	20.79%	21.25%	21.78%	11.02%
RR	19.18%	20.40%	19.91%	20.18%	10.44%
GT	21.62%	20.58%	21.18%	21.07%	10.36%
PBKS	18.04%	19.92%	18.97%	18.56%	9.29%
CSK	20.71%	20.22%	20.49%	19.39%	9.09%
KKR	18.94%	19.63%	19.29%	18.38%	8.87%
RCB	15.63%	18.69%	17.19%	16.21%	8.02%
SRH	11.43%	15.54%	13.38%	11.96%	5.74%

Q1 = No. of times in Q1 / 1,000,000

CHAMPIONSHIP PROBABILITIES:			
Team	Championship Wins	Win %	Win %
MI	137,254	13.73%	
DC	134,391	13.44%	
LSG	110,233	11.02%	
RR	104,401	10.44%	
GT	103,636	10.36%	
PBKS	92,918	9.29%	
CSK	90,912	9.09%	
KKR	88,654	8.87%	
RCB	80,210	8.02%	
SRH	57,391	5.74%	

Win % = No. of finals won /
1,000,000

WINNING TEAM: MI



CONCLUSION

- This project applied data-driven analysis and statistical modeling to build a competitive, low-budget IPL team inspired by the Moneyball approach.
- Player ratings were derived using PCA on engineered features, price predictions through KNN algorithm, and team performance was tested using Monte Carlo simulations.
- Simulation outcomes showed that our analytically selected team consistently achieved playoff-level performance, proving the practical value of data-driven decision-making in cricket.
- This analysis demonstrated that data analytics can uncover undervalued talent and create a team capable of outperforming existing franchises under budget constraints.

LIMITATIONS

- Historical Bias: Player ratings relied on past aggregated data, overlooking current form and situational adaptability.
- Simplified Simulations: Monte Carlo models excluded contextual factors like pitch, venue, and weather.
- Static Performance: Player form was assumed constant, ignoring fatigue, injuries, and confidence shifts.
- Data and Auction Gaps: Limited fielding data and absence of auction constraints reduced real-world accuracy.

FUTURE SCOPE

- Context-Aware Ratings: Integrate venue, opposition, and pitch factors for more realistic player evaluations.
- Dynamic Performance Modelling: Track form, fatigue, and confidence using advanced statistical methods.
- Enhanced Predictive Analytics: Apply machine learning models like Gradient Boosted Trees or Neural Networks for improved accuracy.
- Realistic Team Building: Incorporate auction constraints, player synergies, and situational metrics for more practical team simulations.

REFERENCES

- Statsguru (via ESPNcricinfo) – cricket statistics database. [ESPN Cricinfo+1](#)
- “IPL Data Analysis and Prediction Using Machine Learning”. [ResearchGate](#)
- “Statistical Analysis of IPL Player Performance using Advanced Techniques”. [IJCA](#)
- “A New Machine Learning Based Deep Performance Index For Ranking IPL T20 Cricketers” - [IJCA](#)
- Official IPL Website - [iplt20](#)
- Kaggle

THANK YOU & SEE YOU IN THE NEXT SEASON

