

```

from pyspark.sql import SparkSession
from pyspark.sql import functions as F
from pyspark.sql.window import Window

```

```

IPL_auction_data=spark.read.csv("dbfs:/FileStore/tables/
IPL_auction_data.csv", inferSchema=False,header=True)

```

```

IPL_auction_data.show()

```

```

+---+-----+-----+-----+-----+-----+
+-----+-----+
|_c0|      Country|      Player|      Team|Base
price|Winning bid|Year|
+---+-----+-----+-----+-----+-----+
+-----+-----+
|  0|      Guyana|Christopher Barnwell|Royal Challengers...|
30.5|      30.5|2013|
|  1|South Africa|      Johan Botha|      Delhi Daredevils|
183|      274.5|2013|
|  2|      Australia|      Daniel Christian|Royal Challengers...|
61|      61|2013|
|  3|      Australia|      Michael Clarke|Pune Warriors India|
244|      244|2013|
|  4|      Australia|Nathan Coulter-Nile|      Mumbai Indians|
61|      274.5|2013|
|  5|      Sri Lanka|      Akila Dananjaya|Chennai Super Kings|
12.2|      12.2|2013|
|  6|South Africa|      Quinton de Kock|Sunrisers Hyderabad|
12.2|      12.2|2013|
|  7|      Barbados|      Fidel Edwards|      Rajasthan Royals|
61|      128.1|2013|
|  8|      Australia|      James Faulkner|      Rajasthan Royals|
61|      244|2013|
|  9|      India|      Manpreet Gony|      Kings XI Punjab|
122|      305|2013|
| 10|      Australia|      Moisés Henriques|Royal Challengers...|
61|      183|2013|
| 11|      Barbados|      Jason Holder|Chennai Super Kings|
12.2|      12.2|2013|
| 12|      Australia|      Phillip Hughes|      Mumbai Indians|
61|      61|2013|
| 13|      Australia|      Ben Laughlin|Chennai Super Kings|
12.2|      12.2|2013|
| 14|      Australia|      Glenn Maxwell|      Mumbai Indians|
122|      610|2013|
| 15|New Zealand|      Nathan McCullum|Sunrisers Hyderabad|
61|      61|2013|
| 16|      Australia|      Clint McKay|Sunrisers Hyderabad|
61|      61|2013|
| 17|South Africa|      Ryan McLaren|Kolkata Knight Ri...|

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30.5|      30.5|2013|
| 18|      Sri Lanka|      Ajantha Mendis| Pune Warriors India|
30.5|      442.25|2013|
| 19|      Sri Lanka|      Jeevan Mendis|      Delhi Daredevils|
30.5|      30.5|2013|
+---+-----+-----+-----+-----+-----+
+-----+-----+
only showing top 20 rows

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```

IPL_auction_data = IPL_auction_data.withColumn("Base price",
F.col("Base price").cast("int"))
IPL_auction_data = IPL_auction_data.withColumn("Winning bid",
F.col("Winning bid").cast("int"))
IPL_auction_data = IPL_auction_data.withColumn("Year",
F.col("Year").cast("int"))

```

```

IPL_auction_data.printSchema()

```

```

root
|-- _c0: string (nullable = true)
|-- Country: string (nullable = true)
|-- Player: string (nullable = true)
|-- Team: string (nullable = true)
|-- Base price: integer (nullable = true)
|-- Winning bid: integer (nullable = true)
|-- Year: integer (nullable = true)

```

```

len(IPL_auction_data.columns)

```

```

Out[98]: 7

```

```

IPL_auction_data.count()

```

```

Out[99]: 1052

```

```

IPL_auction_data = IPL_auction_data.withColumnRenamed("_c0", "S.No")

```

```

IPL_auction_data.show()

```

```

+---+-----+-----+-----+-----+-----+
+-----+-----+-----+
|S.No|      Country|      Player|      Team|Base
price|Winning bid|Year|
+---+-----+-----+-----+-----+-----+
+-----+-----+-----+
|  0|      Guyana|Christopher Barnwell|Royal Challengers...|
30|      30|2013|
|  1|South Africa|      Johan Botha|      Delhi Daredevils|
183|      274|2013|
|  2|      Australia|      Daniel Christian|Royal Challengers...|

```

61	61 2013		
3	Australia	Michael Clarke	Pune Warriors India
244	244 2013		
4	Australia	Nathan Coulter-Nile	Mumbai Indians
61	274 2013		
5	Sri Lanka	Akila Dananjaya	Chennai Super Kings
12	12 2013		
6	South Africa	Quinton de Kock	Sunrisers Hyderabad
12	12 2013		
7	Barbados	Fidel Edwards	Rajasthan Royals
61	128 2013		
8	Australia	James Faulkner	Rajasthan Royals
61	244 2013		
9	India	Manpreet Gony	Kings XI Punjab
122	305 2013		
10	Australia	Moisés Henriques	Royal Challengers...
61	183 2013		
11	Barbados	Jason Holder	Chennai Super Kings
12	12 2013		
12	Australia	Phillip Hughes	Mumbai Indians
61	61 2013		
13	Australia	Ben Laughlin	Chennai Super Kings
12	12 2013		
14	Australia	Glenn Maxwell	Mumbai Indians
122	610 2013		
15	New Zealand	Nathan McCullum	Sunrisers Hyderabad
61	61 2013		
16	Australia	Clint McKay	Sunrisers Hyderabad
61	61 2013		
17	South Africa	Ryan McLaren	Kolkata Knight Ri...
30	30 2013		
18	Sri Lanka	Ajantha Mendis	Pune Warriors India
30	442 2013		
19	Sri Lanka	Jeevan Mendis	Delhi Daredevils
30	30 2013		

```

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only showing top 20 rows

```
ipl2023auction=IPL_auction_data.where(F.col('Year') == 2023)
```

```
ipl2023auction.show()
```

```

+---+-----+-----+-----+-----+-----+
+-----+-----+
|S.No|    Country|    Player|    Team|Base price|
Winning bid|Year|
+---+-----+-----+-----+-----+
+-----+-----+

```

969	New Zealand	Kane Williamson	Gujarat Titans	200
200	2023			
970	England	Harry Brook	Sunrisers Hyderabad	150
null	2023			
971	India	Mayank Agarwal	Sunrisers Hyderabad	100
825	2023			
972	India	Ajinkya Rahane	Chennai Super Kings	50
50	2023			
973	England	Sam Curran	Punjab Kings	200
null	2023			
974	West Indies	Odean Smith	Gujarat Titans	50
50	2023			
975	Zimbabwe	Sikandar Raza	Punjab Kings	50
50	2023			
976	West Indies	Jason Holder	Rajasthan Royals	200
575	2023			
977	Australia	Cameron Green	Mumbai Indians	200
null	2023			
978	England	Ben Stokes	Chennai Super Kings	200
null	2023			
979	West Indies	Nicholas Pooran	Lucknow Super Giants	200
null	2023			
980	South Africa	Heinrich Klaasen	Sunrisers Hyderabad	100
525	2023			
981	England	Phil Salt	Delhi Capitals	200
200	2023			
982	England	Reece Topley	Royal Challengers...	75
190	2023			
983	India	Jaydev Unadkat	Lucknow Super Giants	50
50	2023			
984	Australia	Jhye Richardson	Mumbai Indians	150
150	2023			
985	India	Ishant Sharma	Delhi Capitals	50
50	2023			
986	England	Adil Rashid	Sunrisers Hyderabad	200
200	2023			
987	India	Mayank Markande	Sunrisers Hyderabad	50
50	2023			
988	India	Shaik Rasheed	Chennai Super Kings	20
20	2023			

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```

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only showing top 20 rows
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```
ipl2023auction.count()
```

```
Out[104]: 83
```

```
ipl2023auction.count()
```

Out[105]: 83

```
avg_winning_bid_by_country = IPL_auction_data.where(F.col('Year') ==
2023).groupBy('Country').agg(F.count('Player').alias('no.of_players'))
avg_winning_bid_by_country.show()
```

Country	no.of_players
Afghanistan	1
India	52
West Indies	5
Bangladesh	3
Ireland	1
Zimbabwe	1
Namibia	1
New Zealand	2
England	9
Australia	4
South Africa	4

```
window_spec = Window().partitionBy('Year').orderBy(F.col('Winning
bid').desc())
ranked_players = IPL_auction_data.withColumn('BidRank',
F.rank().over(window_spec))
ranked_players.show()
```

S.No	Country	Player	Team
Base price	Winning bid	Year	BidRank
14	Australia	Glenn Maxwell	Mumbai Indians
122	610	2013	1
18	Sri Lanka	Ajantha Mendis	Pune Warriors India
30	442	2013	2
29	Australia	Kane Richardson	Pune Warriors India
61	427	2013	3
22	India	Abhishek Nayar	Pune Warriors India
61	411	2013	4
25	Sri Lanka	Thisara Perera	Sunrisers Hyderabad
30	411	2013	4
20	South Africa	Chris Morris	Chennai Super Kings
12	381	2013	6
32	Sri Lanka	Sachithra Senanayake	Kolkata Knight Ri...
30	381	2013	6

21	Australia	Dirk Nannes	Chennai Super Kings
122	366 2013	8	
36	India	Jaydev Unadkat	Royal Challengers...
61	320 2013	9	
9	India	Manpreet Gony	Kings XI Punjab
122	305 2013	10	
1	South Africa	Johan Botha	Delhi Daredevils
183	274 2013	11	
4	Australia	Nathan Coulter-Nile	Mumbai Indians
61	274 2013	11	
31	Saint Lucia	Darren Sammy	Sunrisers Hyderabad
61	259 2013	13	
3	Australia	Michael Clarke	Pune Warriors India
244	244 2013	14	
8	Australia	James Faulkner	Rajasthan Royals
61	244 2013	14	
27	Australia	Ricky Ponting	Mumbai Indians
244	244 2013	14	
34	India	R. P. Singh	Royal Challengers...
61	244 2013	14	
10	Australia	Moisés Henriques	Royal Challengers...
61	183 2013	18	
26	Australia	Luke Pomersbach	Kings XI Punjab
30	183 2013	18	
28	Trinidad and Tobago	Ravi Rampaul	Royal Challengers...
30	176 2013	20	

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only showing top 20 rows

```

```
ipl2023auction.printSchema()
```

```
root
```

```

|-- S.No: string (nullable = true)
|-- Country: string (nullable = true)
|-- Player: string (nullable = true)
|-- Team: string (nullable = true)
|-- Base price: integer (nullable = true)
|-- Winning bid: integer (nullable = true)
|-- Year: integer (nullable = true)

```

```
window_spec = Window().partitionBy('Year').orderBy(F.col('Winning
bid').desc())
```

```
ranked_players = ipl2023auction.withColumn('BidRank',
F.dense_rank().over(window_spec))
```

```
ranked_players.show()
```

+-----+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+					
S.No	Country	Player	Team	Base price	
Winning bid	Year	BidRank			
+-----+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+					
971	India	Mayank Agarwal	Sunrisers Hyderabad	100	
825 2023	1				
998	India	Shivam Mavi	Gujarat Titans	40	
600 2023	2				
976	West Indies	Jason Holder	Rajasthan Royals	200	
575 2023	3				
999	India	Mukesh Kumar	Delhi Capitals	20	
550 2023	4				
980	South Africa	Heinrich Klaasen	Sunrisers Hyderabad	100	
525 2023	5				
1034	South Africa	Rilee Rossouw	Royal Challengers...	200	
460 2023	6				
1019	Ireland	Josh Little	Gujarat Titans	50	
440 2023	7				
1002	England	Will Jacks	Royal Challengers...	150	
320 2023	8				
989	India	Vivrant Sharma	Sunrisers Hyderabad	20	
260 2023	9				
1001	India	Manish Pandey	Delhi Capitals	100	
240 2023	10				
969	New Zealand	Kane Williamson	Gujarat Titans	200	
200 2023	11				
981	England	Phil Salt	Delhi Capitals	200	
200 2023	11				
986	England	Adil Rashid	Sunrisers Hyderabad	200	
200 2023	11				
982	England	Reece Topley	Royal Challengers...	75	
190 2023	12				
1010	India	Mayank Dagar	Sunrisers Hyderabad	20	
180 2023	13				
1012	India	Prerak Mankad	Lucknow Super Giants	20	
180 2023	13				
984	Australia	Jhye Richardson	Mumbai Indians	150	
150 2023	14				
1037	Australia	Adam Zampa	Rajasthan Royals	150	
150 2023	14				
1048	Bangladesh	Shakib al Hasan	Kolkata Knight Ri...	150	
150 2023	14				
1051	Bangladesh	Shakib al Hasan	Kolkata Knight Ri...	150	
150 2023	14				
+-----+-----+-----+-----+-----+-----+					
+-----+-----+-----+-----+-----+					

only showing top 20 rows

```
avg_winning_bid_by_country =  
ipl2023auction.groupBy('Country').agg(F.round(F.avg('Winning  
bid'),2).alias('avg_winning_bid'),F.count('Player').alias("no_of_playe  
rs"))
```

```
avg_winning_bid_by_country.show()
```

Country	avg_winning_bid	no_of_players
Afghanistan	50.0	1
India	83.17	52
West Indies	193.75	5
Bangladesh	116.67	3
Ireland	440.0	1
Zimbabwe	50.0	1
Namibia	100.0	1
New Zealand	150.0	2
England	185.0	9
Australia	125.0	4
South Africa	256.25	4

```
total_bid_amount =  
avg_winning_bid_by_country.withColumn('total_winning_bid',  
F.round(F.col('avg_winning_bid') * F.col('no_of_players'),  
2)).orderBy(F.col("total_winning_bid").desc())
```

```
result_with_product.show()
```

Country	avg_winning_bid	no_of_players	total_winning_bid
Afghanistan	50.0	1	50.0
India	83.17	52	4324.84
West Indies	193.75	5	968.75
Bangladesh	116.67	3	350.01
Ireland	440.0	1	440.0
Zimbabwe	50.0	1	50.0
Namibia	100.0	1	100.0
New Zealand	150.0	2	300.0
England	185.0	9	1665.0
Australia	125.0	4	500.0
South Africa	256.25	4	1025.0


```
percentage_increase = ipl2023auction.withColumn('PercentageIncrease',
((F.col('Winning bid') - F.col('Base price')) / F.col('Base price')) *
100).orderBy(F.col("PercentageIncrease").desc()).show()
```

S.No	Country	Player	Team	Base price	Winning bid	Year	PercentageIncrease
999	India	Mukesh Kumar	Delhi Capitals	20	550	2023	2650.0
998	India	Shivam Mavi	Gujarat Titans	40	600	2023	1400.0
989	India	Vivrant Sharma	Sunrisers Hyderabad	20	260	2023	1200.0
1010	India	Mayank Dagar	Sunrisers Hyderabad	20	180	2023	800.0
1012	India	Prerak Mankad	Lucknow Super Giants	20	180	2023	800.0
1019	Ireland	Josh Little	Gujarat Titans	50	440	2023	780.0
971	India	Mayank Agarwal	Sunrisers Hyderabad	100	825	2023	725.0
994	India	K. S. Bharat	Gujarat Titans	20	120	2023	500.0
980	South Africa	Heinrich Klaasen	Sunrisers Hyderabad	100	525	2023	425.0
993	India	N Jagadeesan	Kolkata Knight Ri...	20	90	2023	350.0
992	India	Nishant Sindhu	Chennai Super Kings	20	60	2023	200.0
996	India	Vaibhav Arora	Kolkata Knight Ri...	20	60	2023	200.0
1025	India	Avinash Singh	Royal Challengers...	20	60	2023	200.0
976	West Indies	Jason Holder	Rajasthan Royals	200	575	2023	187.5
982	England	Reece Topley	Royal Challengers...	75	190	2023	153.33333333333334
1001	India	Manish Pandey	Delhi Capitals	100	240	2023	140.0
1034	South Africa	Rilee Rossouw	Royal Challengers...	200	460	2023	130.0
997	India	Yash Thakur	Lucknow Super Giants	20	45	2023	125.0
1002	England	Will Jacks	Royal Challengers...	150	320	2023	113.33333333333333
1008	India	Harpreet Singh Bh...	Punjab Kings	20	40	2023	100.0

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+-----+-----+-----+-----+
only showing top 20 rows
```

```
max_winning_bid_players = IPL_auction_data.withColumn('BidRank',
F.rank().over(window_spec)).filter('BidRank == 1').show()
```

```
+----+-----+-----+-----+-----+
+-----+-----+-----+
|S.No|    Country|    Player|    Team|Base price|
Winning bid|Year|BidRank|
+----+-----+-----+-----+-----+
+-----+-----+-----+
| 14|    Australia|    Glenn Maxwell|    Mumbai Indians|    122|
610|2013|    1|
| 39|    England|    Kevin Pietersen|    Delhi Daredevils|    200|
900|2014|    1|
| 199|    India|    Yuvraj Singh|    Delhi Daredevils|    200|
1600|2015|    1|
| 260|    Australia|    Shane Watson|Royal Challengers...|    200|
950|2016|    1|
| 354|    England|    Ben Stokes|Rising Pune Super...|    200|
1450|2017|    1|
| 420|    England|    Ben Stokes|    Rajasthan Royals|    200|
1250|2018|    1|
| 595|    India|    Jaydev Unadkat|    Rajasthan Royals|    150|
840|2019|    1|
| 605|    India|    Varun Chakravarthi|    Kings XI Punjab|    20|
840|2019|    1|
| 653|    Australia|    Pat Cummins|Kolkata Knight Ri...|    200|
1550|2020|    1|
| 713|South Africa|    Chris Morris|    Rajasthan Royals|    75|
1625|2021|    1|
| 790|    India|    Ishan Kishan|    Mumbai Indians|    150|
1525|2022|    1|
| 971|    India|    Mayank Agarwal|    Sunrisers Hyderabad|    100|
825|2023|    1|
+----+-----+-----+-----+-----+
+-----+-----+-----+
```

```
window_spec_cumulative =
Window().partitionBy('Player').orderBy('Year').rowsBetween(Window.unbo
undedPreceding, 0)
cumulative_winning_bid =
IPL_auction_data.withColumn('CumulativeWinningBid', F.sum('Winning
bid').over(window_spec_cumulative))
cumulative_winning_bid.show(300)
```

S.No	Country	Player	Team
Base price	Winning bid	Year	CumulativeWinningBid
53	Australia	Aaron Finch	Sunrisers Hyderabad
100	400	2014	400
222	Australia	Aaron Finch	Mumbai Indians
100	320	2015	720
307	Australia	Aaron Finch	Gujarat Lions
100	100	2016	820
434	Australia	Aaron Finch	Kings XI Punjab
150	620	2018	1440
650	Australia	Aaron Finch	Royal Challengers...
100	440	2020	1880
1046	India	Abdul Basith	Rajasthan Royals
20	20	2023	20
1049	India	Abdul Basith	Rajasthan Royals
20	20	2023	40
690	India	Abdul Samad	Sunrisers Hyderabad
20	20	2020	20
906	India	Abhijeet Tomar	Kolkata Knight Ri...
20	40	2022	40
224	India	Abhimanyu Mithun	Mumbai Indians
30	30	2015	30
283	India	Abhimanyu Mithun	Sunrisers Hyderabad
30	30	2016	60
807	India	Abhinav Manohar S...	Gujarat Titans
20	260	2022	260
22	India	Abhishek Nayar	Pune Warriors India
61	411	2013	411
91	India	Abhishek Nayar	Rajasthan Royals
30	100	2014	511
526	India	Abhishek Sharma	Delhi Daredevils
20	55	2018	55
812	India	Abhishek Sharma	Sunrisers Hyderabad
20	650	2022	705
144	India	Abu Nechim Ahmed	Royal Challengers...
30	30	2014	30
242	New Zealand	Adam Milne	Royal Challengers...
30	70	2015	70
715	New Zealand	Adam Milne	Mumbai Indians
50	320	2021	390
886	New Zealand	Adam Milne	Chennai Super Kings
150	190	2022	580
343	Australia	Adam Zampa	Rising Pune Super...
30	30	2016	30
1037	Australia	Adam Zampa	Rajasthan Royals
150	150	2023	180

986	England	Adil Rashid	Sunrisers Hyderabad
200	200 2023	200	
218	India	Aditya Garhwal	Kolkata Knight Ri...
10	25 2015	25	
135	India	Aditya Tare	Mumbai Indians
20	160 2014	160	
292	India	Aditya Tare	Sunrisers Hyderabad
20	120 2016	280	
367	India	Aditya Tare	Delhi Daredevils
20	25 2017	305	
562	India	Aditya Tare	Mumbai Indians
20	20 2018	325	
631	India	Agnivesh Ayachi	Kings XI Punjab
20	20 2019	20	
226	Australia	Aiden Blizzard	Mumbai Indians
30	30 2015	30	
839	South Africa	Aiden Markram	Sunrisers Hyderabad
100	260 2022	260	
18	Sri Lanka	Ajantha Mendis	Pune Warriors India
30	442 2013	442	
1029	India	Ajay Mandal	Chennai Super Kings
20	20 2023	20	
422	India	Ajinkya Rahane	Rajasthan Royals
200	400 2018	400	
840	India	Ajinkya Rahane	Kolkata Knight Ri...
100	100 2022	500	
972	India	Ajinkya Rahane	Chennai Super Kings
50	50 2023	550	
827	India	Akash Deep	Royal Challengers...
20	20 2022	20	
668	India	Akash Singh	Rajasthan Royals
20	20 2020	20	
763	India	Akash Singh	Rajasthan Royals
20	20 2021	40	
1042	India	Akash Vasisht	Rajasthan Royals
20	20 2023	20	
1036	West Indies	Akeal Hosein	Sunrisers Hyderabad
100	100 2023	100	
349	India	Akhil Herwadkar	Delhi Daredevils
10	10 2016	10	
5	Sri Lanka	Akila Dananjaya	Chennai Super Kings
12	12 2013	12	
567	Sri Lanka	Akila Dananjaya	Mumbai Indians
50	50 2018	62	
165	India	Akshar Patel	Kings XI Punjab
20	75 2014	75	
323	India	Akshay Karnewar	Royal Challengers...
10	10 2016	10	
228	India	Akshay Wakhare	Mumbai Indians
10	10 2015	10	

324		India	Akshdeep Nath	Gujarat Lions
10	10 2016		10	
412		India	Akshdeep Nath	Gujarat Lions
10	10 2017		20	
543		India	Akshdeep Nath	Kings XI Punjab
20	100 2018		120	
635		India	Akshdeep Nath	Royal Challengers...
20	360 2019		480	
66		South Africa	Albie Morkel	Royal Challengers...
150	240 2014		240	
207		South Africa	Albie Morkel	Delhi Daredevils
30	30 2015		270	
656		Australia	Alex Carey	Delhi Capitals
50	240 2020		240	
931		England	Alex Hales	Kolkata Knight Ri...
150	150 2022		150	
899		West Indies	Alzarri Joseph	Gujarat Titans
75	240 2022		240	
968		India	Aman Khan	Kolkata Knight Ri...
20	20 2022		20	
454		India	Ambati Rayudu	Chennai Super Kings
50	220 2018		220	
789		India	Ambati Rayudu	Chennai Super Kings
200	675 2022		895	
50		India	Amit Mishra	Sunrisers Hyderabad
200	475 2014		475	
180		India	Amit Mishra	Rajasthan Royals
10	10 2014		485	
202		India	Amit Mishra	Delhi Daredevils
10	350 2015		835	
344		India	Amit Mishra	Gujarat Lions
10	10 2016		845	
465		India	Amit Mishra	Delhi Daredevils
150	400 2018		1245	
1007		India	Amit Mishra	Lucknow Super Giants
50	50 2023		1295	
163		India	Amit Paunikar	Sunrisers Hyderabad
20	20 2014		20	
93		Jamaica	Andre Russell	Kolkata Knight Ri...
50	60 2014		60	
195		Australia	Andrew Tye	Chennai Super Kings
20	20 2015		20	
318		Australia	Andrew Tye	Gujarat Lions
30	50 2016		70	
537		Australia	Andrew Tye	Kings XI Punjab
100	720 2018		790	
702		Australia	Andrew Tye	Rajasthan Royals
100	100 2020		890	
902		India	Aneeshwar Gautam	Royal Challengers...
100	100 2022		100	

200		Sri Lanka	Angelo Mathews	Delhi Daredevils
150	750 2015		750	
353		Sri Lanka	Angelo Mathews	Delhi Daredevils
200	200 2017		950	
369		India	Aniket Choudhary	Royal Challengers...
10	200 2017		200	
490		India	Aniket Choudhary	Royal Challengers...
30	30 2018		230	
552		India	Aniruddha Joshi	Royal Challengers...
20	20 2018		20	
691		India	Aniruddha Joshi	Rajasthan Royals
20	20 2020		40	
362		India	Ankit Bawne	Delhi Daredevils
10	10 2017		10	
176		India	Ankit Nagendra Sh...	Rajasthan Royals
10	10 2014		10	
301		India	Ankit Rajpoot	Kolkata Knight Ri...
10	150 2016		150	
494		India	Ankit Rajpoot	Kings XI Punjab
30	300 2018		450	
832		India	Ankit Rajpoot	Lucknow Super Giants
20	50 2022		500	
295		India	Ankit Sharma	Rising Pune Super...
10	10 2016		10	
524		India	Ankit Sharma	Rajasthan Royals
20	20 2018		30	
128		India	Ankush Bains	Rajasthan Royals
10	10 2014		10	
197		India	Ankush Bains	Chennai Super Kings
10	10 2015		20	
310		India	Ankush Bains	Rising Pune Super...
10	10 2016		30	
606		India	Ankush Bains	Delhi Capitals
20	20 2019		50	
602		India	Anmolpreet Singh	Mumbai Indians
20	80 2019		80	
924		India	Anmolpreet Singh	Mumbai Indians
20	20 2022		100	
1038		India	Anmolpreet Singh	Sunrisers Hyderabad
20	20 2023		120	
614		South Africa	Anrich Nortje	Kolkata Knight Ri...
20	20 2019		20	
916		India	Ansh Patel	Punjab Kings
20	20 2022		20	
667		India	Anuj Rawat	Rajasthan Royals
20	80 2020		80	
821		India	Anuj Rawat	Royal Challengers...
20	340 2022		420	
570		India	Anukul Roy	Mumbai Indians
20	20 2018		20	

866		India	Anukul Roy Kolkata Knight Ri...
20	20 2022		40
918		India	Anunay Singh Rajasthan Royals
20	20 2022		20
152		India	Anureet Singh Kings XI Punjab
20	20 2014		20
528		India	Anureet Singh Rajasthan Royals
30	30 2018		50
162		India	Apoorv Vijay Wank... Mumbai Indians
10	10 2014		10
520		India	Apoorv Wankhade Kolkata Knight Ri...
20	20 2018		20
764		India	Arjun Tendulkar Mumbai Indians
20	20 2021		20
953		India	Arjun Tendulkar Mumbai Indians
20	30 2022		50
314		India	Armaan Jaffer Kings XI Punjab
10	10 2016		10
619		India	Arshdeep Singh Kings XI Punjab
20	20 2019		20
579		India	Aryaman Birla Rajasthan Royals
20	30 2018		30
964		India	Aryan Juyal Mumbai Indians
20	20 2022		20
396		Sri Lanka	Asela Gunaratne Mumbai Indians
30	30 2017		30
98		India	Ashish Nehra Chennai Super Kings
200	200 2014		200
261		India	Ashish Nehra Sunrisers Hyderabad
200	550 2016		750
173		India	Ashish Reddy Sunrisers Hyderabad
20	20 2014		20
71		India	Ashok Dinda Royal Challengers...
100	150 2014		150
336		India	Ashok Dinda Rising Pune Super...
50	50 2016		200
917		India	Ashok Sharma Kolkata Knight Ri...
20	50 2022		50
644		Australia	Ashton Turner Rajasthan Royals
50	50 2019		50
809		India	Ashwin Hebbar Delhi Capitals
20	20 2022		20
939		India	Atharva Taide Punjab Kings
20	20 2022		20
493		India	Avesh Khan Delhi Daredevils
20	70 2018		70
829		India	Avesh Khan Lucknow Super Giants
20	1000 2022		1070
1025		India	Avinash Singh Royal Challengers...
20	60 2023		60

591		India	Axar Patel	Delhi Capitals
100	500 2019		500	
901		India	Ayush Badoni	Lucknow Super Giants
20	20 2022		20	
963		India	B. Sai Sudharshan	Gujarat Titans
20	20 2022		20	
119		India	Baba Aparajith	Chennai Super Kings
10	10 2014		10	
326		India	Baba Aparajith	Rising Pune Super...
10	10 2016		20	
903		India	Baba Indraajith	Kolkata Knight Ri...
20	20 2022		20	
913		India	Baltej Singh	Punjab Kings
20	20 2022		20	
641		India	Bandaru Ayyappa	Delhi Capitals
20	20 2019		20	
234		India	Barinder Sran	Rajasthan Royals
10	10 2015		10	
282		India	Barinder Sran	Sunrisers Hyderabad
50	120 2016		130	
535		India	Barinder Sran	Kings XI Punjab
50	220 2018		350	
611		India	Barinder Sran	Mumbai Indians
50	340 2019		690	
372		India	Basil Thampi	Gujarat Lions
10	85 2017		85	
489		India	Basil Thampi	Sunrisers Hyderabad
30	95 2018		180	
825		India	Basil Thampi	Mumbai Indians
30	30 2022		210	
679		India	Bavanaka Sandeep	Sunrisers Hyderabad
20	20 2020		20	
106		Australia	Ben Cutting	Rajasthan Royals
50	80 2014		80	
317		Australia	Ben Cutting	Sunrisers Hyderabad
50	50 2016		130	
508		Australia	Ben Cutting	Mumbai Indians
100	220 2018		350	
760		Australia	Ben Cutting	Kolkata Knight Ri...
75	75 2021		425	
131		Australia	Ben Dunk	Mumbai Indians
20	20 2014		20	
545		Australia	Ben Dwarshuis	Kings XI Punjab
20	140 2018		140	
108		Australia	Ben Hilfenhaus	Chennai Super Kings
100	100 2014		100	
13		Australia	Ben Laughlin	Chennai Super Kings
12	12 2013		12	
391		Australia	Ben Laughlin	Sunrisers Hyderabad
30	30 2017		42	

566	Australia	Ben Laughlin	Rajasthan Royals
50	50 2018	92	
354	England	Ben Stokes	Rising Pune Super...
200	1450 2017	1450	
420	England	Ben Stokes	Rajasthan Royals
200	1250 2018	2700	
978	England	Ben Stokes	Chennai Super Kings
200	null 2023	2700	
947	England	Benny Howell	Punjab Kings
40	40 2022	40	
168	South Africa	Beuran Hendricks	Kings XI Punjab
30	180 2014	180	
751	India	Bhagath Varma	Chennai Super Kings
20	20 2021	20	
1032	India	Bhagath Varma	Chennai Super Kings
20	20 2023	40	
943	Sri Lanka	Bhanuka Rajapaksa	Punjab Kings
50	50 2022	50	
72	India	Bhuvneshwar Kumar	Sunrisers Hyderabad
150	425 2014	425	
800	India	Bhuvneshwar Kumar	Sunrisers Hyderabad
200	420 2022	845	
392	Australia	Billy Stanlake	Royal Challengers...
30	30 2017	30	
536	Australia	Billy Stanlake	Sunrisers Hyderabad
50	50 2018	80	
563	India	Bipul Sharma	Sunrisers Hyderabad
20	20 2018	20	
54	Australia	Brad Hodge	Rajasthan Royals
200	240 2014	240	
217	Australia	Brad Hogg	Kolkata Knight Ri...
50	50 2015	50	
87	Zimbabwe	Brendan Taylor	Sunrisers Hyderabad
30	30 2014	30	
49	New Zealand	Brendon McCullum	Chennai Super Kings
200	325 2014	325	
435	New Zealand	Brendon McCullum	Royal Challengers...
200	360 2018	685	
923	India	C. Hari Nishanth	Chennai Super Kings
20	20 2022	20	
132	India	CM Gautam	Mumbai Indians
20	20 2014	20	
209	India	CM Gautam	Delhi Daredevils
20	20 2015	40	
540	South Africa	Cameron Delport	Kolkata Knight Ri...
30	30 2018	30	
977	Australia	Cameron Green	Mumbai Indians
200	null 2023	null	
277	Barbados	Carlos Brathwaite	Delhi Daredevils
30	420 2016	420	

440		Barbados	Carlos Brathwaite	Sunrisers Hyderabad
100	200	2018	620	
588		Barbados	Carlos Brathwaite	Kolkata Knight Ri...
75	500	2019	1120	
577		India	Chaitanya Bishnoi	Chennai Super Kings
20	20	2018	20	
185		India	Chama Milind	Sunrisers Hyderabad
10	10	2014	10	
346		India	Chama Milind	Delhi Daredevils
10	10	2016	20	
896		India	Chama Milind	Royal Challengers...
20	25	2022	45	
904		Sri Lanka	Chamika Karunaratne	Kolkata Knight Ri...
50	50	2022	50	
730		India	Chetan Sakariya	Rajasthan Royals
20	120	2021	120	
852		India	Chetan Sakariya	Delhi Capitals
50	420	2022	540	
56		India	Cheteshwar Pujara	Kings XI Punjab
150	190	2014	190	
735		India	Cheteshwar Pujara	Chennai Super Kings
50	50	2021	240	
759		India	Chezian Harinish...	Chennai Super Kings
20	20	2021	20	
405	United Arab Emirates		Chirag Suri	Gujarat Lions
10	10	2017	10	
581		Jamaica	Chris Gayle	Kings XI Punjab
200	200	2018	200	
680		Australia	Chris Green	Kolkata Knight Ri...
20	20	2020	20	
387		England	Chris Jordan	Sunrisers Hyderabad
50	50	2017	50	
532		England	Chris Jordan	Sunrisers Hyderabad
100	100	2018	150	
685		England	Chris Jordan	Kings XI Punjab
75	300	2020	450	
927		England	Chris Jordan	Chennai Super Kings
200	360	2022	810	
102		Australia	Chris Lynn	Kolkata Knight Ri...
50	130	2014	130	
437		Australia	Chris Lynn	Kolkata Knight Ri...
200	960	2018	1090	
646		Australia	Chris Lynn	Mumbai Indians
200	200	2020	1290	
20		South Africa	Chris Morris	Chennai Super Kings
12	381	2013	381	
232		South Africa	Chris Morris	Rajasthan Royals
50	140	2015	521	
268		South Africa	Chris Morris	Delhi Daredevils
50	700	2016	1221	

655	South Africa	Chris Morris Royal Challengers...
150	1000 2020	2221
713	South Africa	Chris Morris Rajasthan Royals
75	1625 2021	3846
377	England	Chris Woakes Kolkata Knight Ri...
200	420 2017	420
439	England	Chris Woakes Royal Challengers...
200	740 2018	1160
652	England	Chris Woakes Delhi Capitals
150	150 2020	1310
0	Guyana	Christopher Barnwell Royal Challengers...
30	30 2013	30
16	Australia	Clint McKay Sunrisers Hyderabad
61	61 2013	61
608	South Africa	Colin Ingram Delhi Capitals
200	640 2019	640
269	New Zealand	Colin Munro Kolkata Knight Ri...
30	30 2016	30
445	New Zealand	Colin Munro Delhi Daredevils
50	190 2018	220
443	New Zealand	Colin de Grandhomme Royal Challengers...
75	220 2018	220
88	New Zealand	Corey Anderson Mumbai Indians
100	450 2014	450
355	New Zealand	Corey Anderson Delhi Daredevils
100	100 2017	550
483	Australia	D'Arcy Short Rajasthan Royals
20	400 2018	400
263	South Africa	Dale Steyn Gujarat Lions
150	230 2016	230
701	South Africa	Dale Steyn Royal Challengers...
200	200 2020	430
743	Australia	Dan Christian Royal Challengers...
75	480 2021	480
2	Australia	Daniel Christian Royal Challengers...
61	61 2013	61
397	Australia	Daniel Christian Rising Pune Super...
100	100 2017	161
505	Australia	Daniel Christian Delhi Daredevils
100	150 2018	311
880	Australia	Daniel Sams Mumbai Indians
100	260 2022	260
1004	Australia	Daniel Sams Lucknow Super Giants
75	75 2023	335
415	Trinidad and Tobago	Darren Bravo Kolkata Knight Ri...
50	50 2017	50
31	Saint Lucia	Darren Sammy Sunrisers Hyderabad
61	259 2013	259
51	Saint Lucia	Darren Sammy Sunrisers Hyderabad
100	350 2014	609

239	Saint Lucia	Darren Sammy	Royal Challengers...
100	280 2015	889	
399	Saint Lucia	Darren Sammy	Kings XI Punjab
30	30 2017	919	
623	India	Darshan Nalkande	Kings XI Punjab
20	30 2019	30	
867	India	Darshan Nalkande	Gujarat Titans
20	20 2022	50	
961	New Zealand	Daryl Mitchell	Rajasthan Royals
75	75 2022	75	
433	South Africa	David Miller	Kings XI Punjab
150	300 2018	300	
674	South Africa	David Miller	Rajasthan Royals
75	75 2020	375	
919	South Africa	David Miller	Gujarat Titans
100	300 2022	675	
43	Australia	David Warner	Sunrisers Hyderabad
150	550 2014	550	
774	Australia	David Warner	Delhi Capitals
200	625 2022	1175	
240	South Africa	David Wiese	Royal Challengers...
30	280 2015	280	
1023	Namibia	David Wiese	Kolkata Knight Ri...
100	100 2023	380	
967	England	David Willey	Royal Challengers...
200	200 2022	200	
714	England	Dawid Malan	Punjab Kings
150	150 2021	150	
130	India	Debabrata Das	Kolkata Knight Ri...
20	20 2014	20	
327	India	Deepak Chahar	Rising Pune Super...
10	10 2016	10	
539	India	Deepak Chahar	Chennai Super Kings
20	80 2018	90	
795	India	Deepak Chahar	Chennai Super Kings
200	1400 2022	1490	
184	India	Deepak Hooda	Rajasthan Royals
10	40 2014	40	
294	India	Deepak Hooda	Sunrisers Hyderabad
10	420 2016	460	
477	India	Deepak Hooda	Sunrisers Hyderabad
40	360 2018	820	
664	India	Deepak Hooda	Kings XI Punjab
40	50 2020	870	
784	India	Deepak Hooda	Lucknow Super Giants
75	575 2022	1445	
331	India	Deepak Punia	Mumbai Indians
10	10 2016	10	
601	India	Devdutt Padikkal	Royal Challengers...
20	20 2019	20	

779		India	Devdutt Padikkal	Rajasthan Royals
150	775 2022		795	
874		New Zealand	Devon Conway	Chennai Super Kings
100	100 2022		100	
808		South Africa	Dewald Brevis	Mumbai Indians
20	300 2022		300	
147		India	Dhawal Kulkarni	Rajasthan Royals
30	110 2014		110	
272		India	Dhawal Kulkarni	Gujarat Lions
200	230 2016		340	
510		India	Dhawal Kulkarni	Rajasthan Royals
50	75 2018		415	
940		India	Dhruv Jurel	Rajasthan Royals
20	20 2022		20	
551		India	Dhruv Shorey	Chennai Super Kings
20	20 2018		20	
692		India	Digvijay Deshmukh	Mumbai Indians
20	20 2020		20	
47		India	Dinesh Karthik	Delhi Daredevils
200	null 2014		null	
238		India	Dinesh Karthik	Royal Challengers...
200	1050 2015		1050	
266		India	Dinesh Karthik	Gujarat Lions
200	230 2016		1280	
451		India	Dinesh Karthik	Kolkata Knight Ri...
200	740 2018		2020	
792		India	Dinesh Karthik	Royal Challengers...
200	550 2022		2570	
235		India	Dinesh Salunkhe	Rajasthan Royals
10	10 2015		10	
21		Australia	Dirk Nannes	Chennai Super Kings
122	366 2013		366	
164		India	Dishant Yagnik	Rajasthan Royals
30	30 2014		30	
843		West Indies	Dominic Drakes	Gujarat Titans
75	110 2022		110	
206		India	Domnic Joseph	Delhi Daredevils
10	75 2015		75	
1013		South Africa	Donavon Ferreira	Rajasthan Royals
20	20 2023		20	
1011		South Africa	Duan Jansen	Mumbai Indians
20	20 2023		20	
582		Sri Lanka	Dushmantha Chameera	Rajasthan Royals
50	50 2018		50	
851		Sri Lanka	Dushmantha Chameera	Lucknow Super Giants
50	200 2022		250	
878		South Africa	Dwayne Pretorius	Chennai Super Kings
50	50 2022		50	
428		Trinidad and Tobago	Dwayne Bravo	Chennai Super Kings
200	640 2018		640	

780	West Indies	Dwayne Bravo Chennai Super Kings
150	440 2022	1080
57	Barbados	Dwayne Smith Chennai Super Kings
150	450 2014	450
258	Barbados	Dwayne Smith Gujarat Lions
50	230 2016	680
198	India	Eklavya Dwivedi Chennai Super Kings
10	10 2015	10
291	India	Eklavya Dwivedi Gujarat Lions
20	100 2016	110
368	India	Eklavya Dwivedi Sunrisers Hyderabad
30	75 2017	185
250	England	Eoin Morgan Sunrisers Hyderabad
150	150 2015	150
351	England	Eoin Morgan Kings XI Punjab
200	200 2017	350
647	England	Eoin Morgan Kolkata Knight Ri...
200	525 2020	875
499	Trinidad and Tobago	Evin Lewis Mumbai Indians
150	380 2018	380
932	West Indies	Evin Lewis Lucknow Super Giants
200	200 2022	580
684	Jamaica	Fabian Allen Sunrisers Hyderabad
50	50 2020	50
742	Jamaica	Fabian Allen Punjab Kings
75	75 2021	125
966	West Indies	Fabian Allen Mumbai Indians
75	75 2022	200
45	South Africa	Faf du Plessis Chennai Super Kings
150	475 2014	475
421	South Africa	Faf du Plessis Chennai Super Kings
150	160 2018	635
772	South Africa	Faf du Plessis Royal Challengers...
200	700 2022	1335
348	South Africa	Farhaan Behardien Kings XI Punjab
30	30 2016	30
937	Afghanistan	Fazalhaq Farooqi Sunrisers Hyderabad
50	50 2022	50
7	Barbados	Fidel Edwards Rajasthan Royals
61	128 2013	128
873	New Zealand	Finn Allen Royal Challengers...
50	80 2022	80
427	India	Gautam Gambhir Delhi Daredevils
200	280 2018	280
44	Australia	George Bailey Kings XI Punjab
200	325 2014	325
14	Australia	Glenn Maxwell Mumbai Indians
122	610 2013	610
90	Australia	Glenn Maxwell Kings XI Punjab

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100|          600|2014|          1210|
| 426|          Australia| Glenn Maxwell| Delhi Daredevils|
200|          900|2018|          2110|
| 651|          Australia| Glenn Maxwell| Kings XI Punjab|
200|          1075|2020|          3185|
| 709|          Australia| Glenn Maxwell| Royal Challengers...|
200|          1425|2021|          4610|

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+---+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+

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only showing top 300 rows

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window_spec_cumulative =
Window().partitionBy('Team').orderBy('Year').rowsBetween(Window.unboundPreceding, 0)
cumulative_winning_bid_by_team =
IPL_auction_data.withColumn('CumulativeWinningBid', F.sum('Winning bid').over(window_spec_cumulative))

```

```

cumulative_winning_bid_by_team.show(300)

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+---+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+
|S.No|          Country|          Player|          Team|
Base price|Winning bid|Year|CumulativeWinningBid|
+---+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+
|  5|          Sri Lanka| Akila Dananjaya|Chennai Super Kings|
12|          12|2013|          12|
| 11|          Barbados| Jason Holder|Chennai Super Kings|
12|          12|2013|          24|
| 13|          Australia| Ben Laughlin|Chennai Super Kings|
12|          12|2013|          36|
| 20|          South Africa| Chris Morris|Chennai Super Kings|
12|          381|2013|          417|
| 21|          Australia| Dirk Nannes|Chennai Super Kings|
122|          366|2013|          783|
| 45|          South Africa| Faf du Plessis|Chennai Super Kings|
150|          475|2014|          1258|
| 49|          New Zealand| Brendon McCullum|Chennai Super Kings|
200|          325|2014|          1583|
| 57|          Barbados| Dwayne Smith|Chennai Super Kings|
150|          450|2014|          2033|
| 98|          India| Ashish Nehra|Chennai Super Kings|
200|          200|2014|          2233|
| 99|          India| Mohit Sharma|Chennai Super Kings|
100|          200|2014|          2433|
| 101| Trinidad and Tobago| Samuel Badree|Chennai Super Kings|
30|          30|2014|          2463|
| 104|          Australia| John Hastings|Chennai Super Kings|

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50	50 2014	2513
108	Australia	Ben Hilfenhaus Chennai Super Kings
100	100 2014	2613
116	New Zealand	Matt Henry Chennai Super Kings
30	30 2014	2643
119	India	Baba Aparajith Chennai Super Kings
10	10 2014	2653
140	India	Mithun Manhas Chennai Super Kings
30	30 2014	2683
148	India	Ishwar Pandey Chennai Super Kings
10	150 2014	2833
156	India	Pawan Negi Chennai Super Kings
10	10 2014	2843
167	India	Vijay Shankar Chennai Super Kings
10	10 2014	2853
170	India	Ronit More Chennai Super Kings
10	10 2014	2863
191	Australia	Michael Hussey Chennai Super Kings
150	150 2015	3013
192	India	Irfan Pathan Chennai Super Kings
150	150 2015	3163
193	India	Rahul Sharma Chennai Super Kings
30	30 2015	3193
194	South Africa	Kyle Abbott Chennai Super Kings
30	30 2015	3223
195	Australia	Andrew Tye Chennai Super Kings
20	20 2015	3243
196	India	Pratyush Singh Chennai Super Kings
10	10 2015	3253
197	India	Ankush Bains Chennai Super Kings
10	10 2015	3263
198	India	Eklavya Dwivedi Chennai Super Kings
10	10 2015	3273
421	South Africa	Faf du Plessis Chennai Super Kings
150	160 2018	3433
424	India	Harbhajan Singh Chennai Super Kings
200	200 2018	3633
428	Trinidad and Tobago	Dwayne Bravo Chennai Super Kings
200	640 2018	4273
441	Australia	Shane Watson Chennai Super Kings
100	400 2018	4673
442	India	Kedar Jadhav Chennai Super Kings
200	780 2018	5453
454	India	Ambati Rayudu Chennai Super Kings
50	220 2018	5673
462	South Africa	Imran Tahir Chennai Super Kings
100	100 2018	5773
463	India	Karn Sharma Chennai Super Kings
200	500 2018	6273

518		India	Shardul Thakur Chennai Super Kings
75	260 2018		6533
529		India	Narayan Jagadeesan Chennai Super Kings
20	20 2018		6553
533		New Zealand	Mitchell Santner Chennai Super Kings
50	50 2018		6603
539		India	Deepak Chahar Chennai Super Kings
20	80 2018		6683
546		India	KM Asif Chennai Super Kings
20	40 2018		6723
548		South Africa	Lungisani Ngidi Chennai Super Kings
50	50 2018		6773
550		India	Kanishk Seth Chennai Super Kings
20	20 2018		6793
551		India	Dhruv Shorey Chennai Super Kings
20	20 2018		6813
554		India	Murali Vijay Chennai Super Kings
200	200 2018		7013
555		England	Sam Billings Chennai Super Kings
100	100 2018		7113
571		England	Mark Wood Chennai Super Kings
150	150 2018		7263
575		India	Kshitiz Sharma Chennai Super Kings
20	20 2018		7283
576		India	Monu Kumar Chennai Super Kings
20	20 2018		7303
577		India	Chaitanya Bishnoi Chennai Super Kings
20	20 2018		7323
600		India	Mohit Sharma Chennai Super Kings
50	500 2019		7823
638		India	Ruturaj Gaikwad Chennai Super Kings
20	20 2019		7843
654		England	Sam Curran Chennai Super Kings
100	550 2020		8393
660		India	Piyush Chawla Chennai Super Kings
100	675 2020		9068
678		Australia	Josh Hazlewood Chennai Super Kings
200	200 2020		9268
699		India	R Sai Kishore Chennai Super Kings
20	20 2020		9288
711		England	Moeen Ali Chennai Super Kings
200	700 2021		9988
725		India	Krishnappa Gowtham Chennai Super Kings
20	925 2021		10913
735		India	Cheteshwar Pujara Chennai Super Kings
50	50 2021		10963
747		India	Harishankar Reddy Chennai Super Kings
20	20 2021		10983
751		India	Bhagath Varma Chennai Super Kings

20	20 2021	11003
759	India	Chezhian Harinish... Chennai Super Kings
20	20 2021	11023
777	India	Robin Uthappa Chennai Super Kings
200	200 2022	11223
780	West Indies	Dwayne Bravo Chennai Super Kings
150	440 2022	11663
789	India	Ambati Rayudu Chennai Super Kings
200	675 2022	12338
795	India	Deepak Chahar Chennai Super Kings
200	1400 2022	13738
828	India	KM Asif Chennai Super Kings
20	20 2022	13758
831	India	Tushar Deshpande Chennai Super Kings
20	20 2022	13778
848	India	Shivam Dube Chennai Super Kings
50	400 2022	14178
858	Sri Lanka	Maheesh Theekshana Chennai Super Kings
50	70 2022	14248
870	India	Rajvardhan Hangar... Chennai Super Kings
30	150 2022	14398
872	India	Simarjeet Singh Chennai Super Kings
20	20 2022	14418
874	New Zealand	Devon Conway Chennai Super Kings
100	100 2022	14518
878	South Africa	Dwaine Pretorius Chennai Super Kings
50	50 2022	14568
881	New Zealand	Mitchell Santner Chennai Super Kings
100	190 2022	14758
886	New Zealand	Adam Milne Chennai Super Kings
150	190 2022	14948
887	India	Subhranshu Senapati Chennai Super Kings
20	20 2022	14968
893	India	Mukesh Choudhary Chennai Super Kings
20	20 2022	14988
897	India	Prashant Solanki Chennai Super Kings
20	120 2022	15108
923	India	C. Hari Nishanth Chennai Super Kings
20	20 2022	15128
925	India	Narayan Jagadeesan Chennai Super Kings
20	20 2022	15148
927	England	Chris Jordan Chennai Super Kings
200	360 2022	15508
952	India	K. Bhagath Varma Chennai Super Kings
20	20 2022	15528
972	India	Ajinkya Rahane Chennai Super Kings
50	50 2023	15578
978	England	Ben Stokes Chennai Super Kings
200	null 2023	15578

988		India	Shaik Rasheed Chennai Super Kings
20	20 2023		15598
992		India	Nishant Sindhu Chennai Super Kings
20	60 2023		15658
1005		New Zealand	Kyle Jamieson Chennai Super Kings
100	100 2023		15758
1029		India	Ajay Mandal Chennai Super Kings
20	20 2023		15778
1032		India	Bhagath Varma Chennai Super Kings
20	20 2023		15798
586		India	Hanuma Vihari Delhi Capitals
50	200 2019		200
591		India	Axar Patel Delhi Capitals
100	500 2019		700
596		India	Ishant Sharma Delhi Capitals
75	110 2019		810
606		India	Ankush Bains Delhi Capitals
20	20 2019		830
607		India	Nathu Singh Delhi Capitals
20	20 2019		850
608		South Africa	Colin Ingram Delhi Capitals
200	640 2019		1490
613		Guyana	Sherfane Rutherford Delhi Capitals
40	200 2019		1690
629		Guyana	Keemo Paul Delhi Capitals
50	50 2019		1740
636		India	Jalaj Saxena Delhi Capitals
20	20 2019		1760
641		India	Bandaru Ayyappa Delhi Capitals
20	20 2019		1780
649		England	Jason Roy Delhi Capitals
150	150 2020		1930
652		England	Chris Woakes Delhi Capitals
150	150 2020		2080
656		Australia	Alex Carey Delhi Capitals
50	240 2020		2320
673		Guyana	Shimron Hetmyer Delhi Capitals
50	775 2020		3095
695		India	Mohit Sharma Delhi Capitals
50	50 2020		3145
698		India	Tushar Deshpande Delhi Capitals
20	20 2020		3165
700		Australia	Marcus Stoinis Delhi Capitals
100	480 2020		3645
703		India	Lalit Yadav Delhi Capitals
20	20 2020		3665
708		Australia	Steve Smith Delhi Capitals
200	220 2021		3885
719		India	Umesh Yadav Delhi Capitals

100	100 2021		3985	
723		India	Ripal Patel	Delhi Capitals
20	20 2021		4005	
726		India	Vishnu Vinod	Delhi Capitals
20	20 2021		4025	
729		India	Lukman Hussain Me...	Delhi Capitals
20	20 2021		4045	
732		India	Manimaran Siddharth	Delhi Capitals
20	20 2021		4065	
737		England	Tom Curran	Delhi Capitals
150	525 2021		4590	
756		England	Sam Billings	Delhi Capitals
200	200 2021		4790	
774		Australia	David Warner	Delhi Capitals
200	625 2022		5415	
788		Australia	Mitchell Marsh	Delhi Capitals
200	650 2022		6065	
801		India	Shardul Thakur	Delhi Capitals
200	1075 2022		7140	
802		Bangladesh	Mustafizur Rahman	Delhi Capitals
200	200 2022		7340	
803		India	Kuldeep Yadav	Delhi Capitals
100	200 2022		7540	
809		India	Ashwin Hebbar	Delhi Capitals
20	20 2022		7560	
813		India	Sarfaraz Khan	Delhi Capitals
20	20 2022		7580	
817		India	Kamlesh Nagarkoti	Delhi Capitals
40	110 2022		7690	
820		India	K. S. Bharat	Delhi Capitals
20	200 2022		7890	
841		India	Mandeep Singh	Delhi Capitals
50	110 2022		8000	
850		India	Khaleel Ahmed	Delhi Capitals
50	525 2022		8525	
852		India	Chetan Sakariya	Delhi Capitals
50	420 2022		8945	
861		India	Lalit Yadav	Delhi Capitals
20	65 2022		9010	
862		India	Ripal Patel	Delhi Capitals
20	20 2022		9030	
863		India	Yash Dhull	Delhi Capitals
20	50 2022		9080	
875		West Indies	Rovman Powell	Delhi Capitals
75	280 2022		9360	
889		India	Pravin Dubey	Delhi Capitals
20	50 2022		9410	
928		South Africa	Lungi Ngidi	Delhi Capitals
50	50 2022		9460	

935	New Zealand	Tim Seifert	Delhi Capitals
50	50 2022	9510	
959	India	Vicky Ostwal	Delhi Capitals
20	20 2022	9530	
981	England	Phil Salt	Delhi Capitals
200	200 2023	9730	
985	India	Ishant Sharma	Delhi Capitals
50	50 2023	9780	
999	India	Mukesh Kumar	Delhi Capitals
20	550 2023	10330	
1001	India	Manish Pandey	Delhi Capitals
100	240 2023	10570	
61	South Africa	Quinton de Kock	Delhi Daredevils
100	350 2014	350	
75	India	Mohammed Shami	Delhi Daredevils
100	425 2014	775	
1	South Africa	Johan Botha	Delhi Daredevils
183	274 2013	274	
19	Sri Lanka	Jeevan Mendis	Delhi Daredevils
30	30 2013	304	
30	New Zealand	Jesse Ryder	Delhi Daredevils
61	158 2013	462	
39	England	Kevin Pietersen	Delhi Daredevils
200	900 2014	1362	
42	India	Murali Vijay	Delhi Daredevils
200	500 2014	1862	
47	India	Dinesh Karthik	Delhi Daredevils
200	null 2014	1862	
52	South Africa	Jean-Paul Duminy	Delhi Daredevils
100	220 2014	2082	
58	New Zealand	Ross Taylor	Delhi Daredevils
200	200 2014	2282	
59	India	Manoj Tiwary	Delhi Daredevils
200	280 2014	2562	
84	India	Rahul Sharma	Delhi Daredevils
50	190 2014	2752	
86	India	Saurabh Tiwary	Delhi Daredevils
50	70 2014	2822	
92	India	Laxmi Ratan Shukla	Delhi Daredevils
50	150 2014	2972	
97	Australia	Nathan Coulter-Nile	Delhi Daredevils
100	425 2014	3397	
100	India	Jaydev Unadkat	Delhi Daredevils
100	280 2014	3677	
105	New Zealand	James Neesham	Delhi Daredevils
30	100 2014	3777	
113	South Africa	Wayne Parnell	Delhi Daredevils
100	100 2014	3877	
117	India	Mayank Agarwal	Delhi Daredevils

10	160 2014		4037	
121		India	Kedar Jadhav	Delhi Daredevils
30	200 2014		4237	
146		India	Siddarth Kaul	Delhi Daredevils
20	45 2014		4282	
151		India	Rahul Shukla	Delhi Daredevils
20	40 2014		4322	
155		India	Shahbaz Nadeem	Delhi Daredevils
30	85 2014		4407	
179		India	Jayant Yadav	Delhi Daredevils
10	10 2014		4417	
182		India	HS Sharath	Delhi Daredevils
10	10 2014		4427	
190		India	Milind Kumar	Delhi Daredevils
10	10 2014		4437	
199		India	Yuvraj Singh	Delhi Daredevils
200	1600 2015		6037	
200		Sri Lanka	Angelo Mathews	Delhi Daredevils
150	750 2015		6787	
201		India	Zaheer Khan	Delhi Daredevils
100	400 2015		7187	
202		India	Amit Mishra	Delhi Daredevils
10	350 2015		7537	
203		India	Shreyas Iyer	Delhi Daredevils
10	260 2015		7797	
204		Australia	Gurinder Sandhu	Delhi Daredevils
30	170 2015		7967	
205		India	Jaydev Unadkat	Delhi Daredevils
50	110 2015		8077	
206		India	Domnic Joseph	Delhi Daredevils
10	75 2015		8152	
207		South Africa	Albie Morkel	Delhi Daredevils
30	30 2015		8182	
208		Australia	Marcus Stoinis	Delhi Daredevils
20	25 2015		8207	
209		India	CM Gautam	Delhi Daredevils
20	20 2015		8227	
210		India	Srikar Bharat	Delhi Daredevils
10	10 2015		8237	
211		India	KK Jiyas	Delhi Daredevils
10	10 2015		8247	
264		India	Sanju Samson	Delhi Daredevils
200	420 2016		8667	
268		South Africa	Chris Morris	Delhi Daredevils
50	700 2016		9367	
277		Barbados	Carlos Brathwaite	Delhi Daredevils
30	420 2016		9787	
287		India	Karun Nair	Delhi Daredevils
10	400 2016		10187	

290		India	Rishabh Pant	Delhi Daredevils
10	190 2016		10377	
296		India	Pawan Negi	Delhi Daredevils
30	850 2016		11227	
308		England	Sam Billings	Delhi Daredevils
30	30 2016		11257	
333		India	Khaleel Ahmed	Delhi Daredevils
10	10 2016		11267	
335		India	Pratyush Singh	Delhi Daredevils
10	10 2016		11277	
339		Australia	Joel Paris	Delhi Daredevils
30	30 2016		11307	
342		India	Pawan Suyal	Delhi Daredevils
10	10 2016		11317	
346		India	Chama Milind	Delhi Daredevils
10	10 2016		11327	
349		India	Akhil Herwadkar	Delhi Daredevils
10	10 2016		11337	
350		India	Mahipal Lomror	Delhi Daredevils
10	10 2016		11347	
353		Sri Lanka	Angelo Mathews	Delhi Daredevils
200	200 2017		11547	
355		New Zealand	Corey Anderson	Delhi Daredevils
100	100 2017		11647	
357		South Africa	Kagiso Rabada	Delhi Daredevils
100	500 2017		12147	
360		Australia	Pat Cummins	Delhi Daredevils
200	450 2017		12597	
362		India	Ankit Bawne	Delhi Daredevils
10	10 2017		12607	
367		India	Aditya Tare	Delhi Daredevils
20	25 2017		12632	
373		India	M Ashwin	Delhi Daredevils
10	100 2017		12732	
390		India	Navdeep Saini	Delhi Daredevils
10	10 2017		12742	
402		India	Shashank Singh	Delhi Daredevils
10	10 2017		12752	
426		Australia	Glenn Maxwell	Delhi Daredevils
200	900 2018		13652	
427		India	Gautam Gambhir	Delhi Daredevils
200	280 2018		13932	
436		England	Jason Roy	Delhi Daredevils
150	150 2018		14082	
445		New Zealand	Colin Munro	Delhi Daredevils
50	190 2018		14272	
459		India	Mohammed Shami	Delhi Daredevils
100	300 2018		14572	
460		South Africa	Kagiso Rabada	Delhi Daredevils

150	420 2018		14992	
465		India	Amit Mishra	Delhi Daredevils
150	400 2018		15392	
475		India	Prithvi Shaw	Delhi Daredevils
20	120 2018		15512	
476		India	Rahul Tewatia	Delhi Daredevils
20	300 2018		15812	
478		India	Vijay Shankar	Delhi Daredevils
40	320 2018		16132	
479		India	Harshal Patel	Delhi Daredevils
20	20 2018		16152	
493		India	Avesh Khan	Delhi Daredevils
20	70 2018		16222	
496		India	Shahbaz Nadeem	Delhi Daredevils
40	320 2018		16542	
505		Australia	Daniel Christian	Delhi Daredevils
100	150 2018		16692	
506		India	Jayant Yadav	Delhi Daredevils
50	50 2018		16742	
507		India	Gurkeerat Singh	Delhi Daredevils
50	75 2018		16817	
517		New Zealand	Trent Boult	Delhi Daredevils
150	220 2018		17037	
523		India	Manjot Kalra	Delhi Daredevils
20	20 2018		17057	
526		India	Abhishek Sharma	Delhi Daredevils
20	55 2018		17112	
547		Nepal	Sandeep Lamichhane	Delhi Daredevils
20	20 2018		17132	
556		India	Naman Ojha	Delhi Daredevils
75	140 2018		17272	
564		India	Sayan Ghosh	Delhi Daredevils
20	20 2018		17292	
258		Barbados	Dwayne Smith	Gujarat Lions
50	230 2016		230	
263		South Africa	Dale Steyn	Gujarat Lions
150	230 2016		460	
266		India	Dinesh Karthik	Gujarat Lions
200	230 2016		690	
272		India	Dhawal Kulkarni	Gujarat Lions
200	230 2016		920	
274		India	Praveen Kumar	Gujarat Lions
50	350 2016		1270	
288		India	Paras Dogra	Gujarat Lions
10	400 2016		1670	
289		India	Ishan Kishan	Gujarat Lions
10	35 2016		1705	
291		India	Eklavya Dwivedi	Gujarat Lions
20	100 2016		1805	

298		India	Pradeep Sangwan	Gujarat Lions
20	20 2016		1825	
302		India	Pravin Tambe	Gujarat Lions
10	20 2016		1845	
303		India	Shivil Kaushik	Gujarat Lions
10	10 2016		1855	
304		India	Sarabjit Ladda	Gujarat Lions
10	10 2016		1865	
307		Australia	Aaron Finch	Gujarat Lions
100	100 2016		1965	
311		India	Umang Sharma	Gujarat Lions
10	10 2016		1975	
318		Australia	Andrew Tye	Gujarat Lions
30	50 2016		2025	
322		India	Shadab Jakati	Gujarat Lions
20	20 2016		2045	
324		India	Akshdeep Nath	Gujarat Lions
10	10 2016		2055	
334		India	Jaydev Shah	Gujarat Lions
20	20 2016		2075	
344		India	Amit Mishra	Gujarat Lions
10	10 2016		2085	
371		India	Nathu Singh	Gujarat Lions
30	50 2017		2135	
372		India	Basil Thampi	Gujarat Lions
10	85 2017		2220	
374		India	Tejas Baroka	Gujarat Lions
10	10 2017		2230	
383		India	Manpreet Gony	Gujarat Lions
30	60 2017		2290	
385		England	Jason Roy	Gujarat Lions
100	100 2017		2390	
400		India	Munaf Patel	Gujarat Lions
30	30 2017		2420	
405	United Arab Emirates		Chirag Suri	Gujarat Lions
10	10 2017		2430	
407		India	Shelley Shaurya	Gujarat Lions
10	10 2017		2440	
408		India	Shubham Agarwal	Gujarat Lions
10	10 2017		2450	
411		India	Pratham Singh	Gujarat Lions
10	10 2017		2460	
412		India	Akshdeep Nath	Gujarat Lions
10	10 2017		2470	
771		India	Mohammed Shami	Gujarat Titans
200	625 2022		625	
778		England	Jason Roy	Gujarat Titans
200	200 2022		825	
797		New Zealand	Lockie Ferguson	Gujarat Titans
200	1000 2022		1825	

807		India	Abhinav Manohar S...	Gujarat Titans
20	260 2022		2085	
816		India	Rahul Tewatia	Gujarat Titans
40	900 2022		2985	
833		Afghanistan	Noor Ahmad	Gujarat Titans
30	30 2022		3015	
838		India	Ravisrinivasan Sa...	Gujarat Titans
20	300 2022		3315	
843		West Indies	Dominic Drakes	Gujarat Titans
75	110 2022		3425	
844		India	Jayant Yadav	Gujarat Titans
100	170 2022		3595	
845		India	Vijay Shankar	Gujarat Titans
50	140 2022		3735	
867		India	Darshan Nalkande	Gujarat Titans
20	20 2022		3755	
871		India	Yash Dayal	Gujarat Titans
20	320 2022		4075	
899		West Indies	Alzarri Joseph	Gujarat Titans
75	240 2022		4315	
907		India	Pradeep Sangwan	Gujarat Titans
20	20 2022		4335	
919		South Africa	David Miller	Gujarat Titans
100	300 2022		4635	
921		India	Wriddhiman Saha	Gujarat Titans
100	190 2022		4825	
922		Australia	Matthew Wade	Gujarat Titans
200	240 2022		5065	
944		India	Gurkeerat Singh	Gujarat Titans
50	50 2022		5115	
949		India	Varun Aaron	Gujarat Titans
50	50 2022		5165	
963		India	B. Sai Sudharshan	Gujarat Titans
20	20 2022		5185	
969		New Zealand	Kane Williamson	Gujarat Titans
200	200 2023		5385	
974		West Indies	Odean Smith	Gujarat Titans
50	50 2023		5435	
994		India	K. S. Bharat	Gujarat Titans
20	120 2023		5555	
998		India	Shivam Mavi	Gujarat Titans
40	600 2023		6155	
1014		India	Urvil Patel	Gujarat Titans
20	20 2023		6175	
1019		Ireland	Josh Little	Gujarat Titans
50	440 2023		6615	
1020		India	Mohit Sharma	Gujarat Titans
50	50 2023		6665	
9		India	Manpreet Gony	Kings XI Punjab

122	305 2013	305
26	Australia	Luke Pomersbach
30	183 2013	488
37	Australia	Mitchell Johnson
200	650 2014	1138
40	India	Virender Sehwag
200	320 2014	1458
44	Australia	George Bailey
200	325 2014	1783
55	Australia	Shaun Marsh
200	220 2014	2003
56	India	Cheteshwar Pujara
150	190 2014	2193
64	India	Wriddhiman Saha
100	220 2014	2413
69	Sri Lanka	Thisara Perera
50	160 2014	2573
81	India	Murali Kartik
100	100 2014	2673
90	Australia	Glenn Maxwell
100	600 2014	3273
95	India	Parvinder Awana
50	65 2014	3338
96	India	Lakshmipathy Balaji
50	180 2014	3518
123	India	Gurkeerat Singh
20	130 2014	3648
139	India	Rishi Dhawan
20	300 2014	3948
142	India	Mandeep Singh
30	80 2014	4028
150	India	Sandeep Sharma
30	85 2014	4113
152	India	Anureet Singh
20	20 2014	4133
165	India	Akshar Patel
20	75 2014	4208

```
+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+
```

only showing top 300 rows

```
amount_spent_by_team=ipl2023auction.groupBy('Team').agg(F.sum("Winning
bid").alias("total_amount_spent"))
```

```
amount_spent_by_team.show()
```

```
+-----+-----+
|           Team|total_amount_spent|
+-----+-----+
```

Sunrisers Hyderabad	2245
Lucknow Super Giants	540
Chennai Super Kings	270
Gujarat Titans	1480
Rajasthan Royals	1075
Royal Challengers...	1110
Kolkata Knight Ri...	690
Punjab Kings	150
Delhi Capitals	1040
Mumbai Indians	300
+-----+	+-----+

```
no_players_by_team=ipl2023auction.groupBy('Team').agg(F.count("Player")
).alias("No_of_players"))
```

```
no_players_by_team.show()
```

+-----+	+-----+
Team	No_of_players
+-----+	+-----+
Sunrisers Hyderabad	13
Lucknow Super Giants	10
Chennai Super Kings	7
Gujarat Titans	7
Rajasthan Royals	11
Royal Challengers...	8
Kolkata Knight Ri...	9
Punjab Kings	6
Delhi Capitals	4
Mumbai Indians	8
+-----+	+-----+