

# IPL

July 25, 2019

```
In [1]: import pandas as pd
        from matplotlib import pyplot as plt
```

```
In [3]: data=pd.read_csv('deliveries.csv')
        type(data)
```

```
Out[3]: pandas.core.frame.DataFrame
```

```
In [4]: #printing the dataset
        data
```

```
Out[4]:
```

	match_id	inning	batting_team \
0	1	1	Sunrisers Hyderabad
1	1	1	Sunrisers Hyderabad
2	1	1	Sunrisers Hyderabad
3	1	1	Sunrisers Hyderabad
4	1	1	Sunrisers Hyderabad
5	1	1	Sunrisers Hyderabad
6	1	1	Sunrisers Hyderabad
7	1	1	Sunrisers Hyderabad
8	1	1	Sunrisers Hyderabad
9	1	1	Sunrisers Hyderabad
10	1	1	Sunrisers Hyderabad
11	1	1	Sunrisers Hyderabad
12	1	1	Sunrisers Hyderabad
13	1	1	Sunrisers Hyderabad
14	1	1	Sunrisers Hyderabad
15	1	1	Sunrisers Hyderabad
16	1	1	Sunrisers Hyderabad
17	1	1	Sunrisers Hyderabad
18	1	1	Sunrisers Hyderabad
19	1	1	Sunrisers Hyderabad
20	1	1	Sunrisers Hyderabad
21	1	1	Sunrisers Hyderabad
22	1	1	Sunrisers Hyderabad
23	1	1	Sunrisers Hyderabad
24	1	1	Sunrisers Hyderabad
25	1	1	Sunrisers Hyderabad

26	1	1	Sunrisers Hyderabad
27	1	1	Sunrisers Hyderabad
28	1	1	Sunrisers Hyderabad
29	1	1	Sunrisers Hyderabad
...	...	...	...
150430	636	2	Royal Challengers Bangalore
150431	636	2	Royal Challengers Bangalore
150432	636	2	Royal Challengers Bangalore
150433	636	2	Royal Challengers Bangalore
150434	636	2	Royal Challengers Bangalore
150435	636	2	Royal Challengers Bangalore
150436	636	2	Royal Challengers Bangalore
150437	636	2	Royal Challengers Bangalore
150438	636	2	Royal Challengers Bangalore
150439	636	2	Royal Challengers Bangalore
150440	636	2	Royal Challengers Bangalore
150441	636	2	Royal Challengers Bangalore
150442	636	2	Royal Challengers Bangalore
150443	636	2	Royal Challengers Bangalore
150444	636	2	Royal Challengers Bangalore
150445	636	2	Royal Challengers Bangalore
150446	636	2	Royal Challengers Bangalore
150447	636	2	Royal Challengers Bangalore
150448	636	2	Royal Challengers Bangalore
150449	636	2	Royal Challengers Bangalore
150450	636	2	Royal Challengers Bangalore
150451	636	2	Royal Challengers Bangalore
150452	636	2	Royal Challengers Bangalore
150453	636	2	Royal Challengers Bangalore
150454	636	2	Royal Challengers Bangalore
150455	636	2	Royal Challengers Bangalore
150456	636	2	Royal Challengers Bangalore
150457	636	2	Royal Challengers Bangalore
150458	636	2	Royal Challengers Bangalore
150459	636	2	Royal Challengers Bangalore

	bowling_team	over	ball	batsman	non_striker \
0	Royal Challengers Bangalore	1	1	DA Warner	S Dhawan
1	Royal Challengers Bangalore	1	2	DA Warner	S Dhawan
2	Royal Challengers Bangalore	1	3	DA Warner	S Dhawan
3	Royal Challengers Bangalore	1	4	DA Warner	S Dhawan
4	Royal Challengers Bangalore	1	5	DA Warner	S Dhawan
5	Royal Challengers Bangalore	1	6	S Dhawan	DA Warner
6	Royal Challengers Bangalore	1	7	S Dhawan	DA Warner
7	Royal Challengers Bangalore	2	1	S Dhawan	DA Warner
8	Royal Challengers Bangalore	2	2	DA Warner	S Dhawan
9	Royal Challengers Bangalore	2	3	DA Warner	S Dhawan
10	Royal Challengers Bangalore	2	4	DA Warner	S Dhawan

11	Royal Challengers Bangalore	2	5	DA Warner	S Dhawan
12	Royal Challengers Bangalore	2	6	MC Henriques	S Dhawan
13	Royal Challengers Bangalore	2	7	MC Henriques	S Dhawan
14	Royal Challengers Bangalore	3	1	S Dhawan	MC Henriques
15	Royal Challengers Bangalore	3	2	MC Henriques	S Dhawan
16	Royal Challengers Bangalore	3	3	MC Henriques	S Dhawan
17	Royal Challengers Bangalore	3	4	MC Henriques	S Dhawan
18	Royal Challengers Bangalore	3	5	S Dhawan	MC Henriques
19	Royal Challengers Bangalore	3	6	MC Henriques	S Dhawan
20	Royal Challengers Bangalore	4	1	MC Henriques	S Dhawan
21	Royal Challengers Bangalore	4	2	MC Henriques	S Dhawan
22	Royal Challengers Bangalore	4	3	S Dhawan	MC Henriques
23	Royal Challengers Bangalore	4	4	S Dhawan	MC Henriques
24	Royal Challengers Bangalore	4	5	MC Henriques	S Dhawan
25	Royal Challengers Bangalore	4	6	S Dhawan	MC Henriques
26	Royal Challengers Bangalore	5	1	S Dhawan	MC Henriques
27	Royal Challengers Bangalore	5	2	MC Henriques	S Dhawan
28	Royal Challengers Bangalore	5	3	S Dhawan	MC Henriques
29	Royal Challengers Bangalore	5	4	MC Henriques	S Dhawan
...	...	...	...	...	...
150430	Sunrisers Hyderabad	16	1	KL Rahul	SR Watson
150431	Sunrisers Hyderabad	16	2	SR Watson	KL Rahul
150432	Sunrisers Hyderabad	16	3	KL Rahul	SR Watson
150433	Sunrisers Hyderabad	16	4	Sachin Baby	SR Watson
150434	Sunrisers Hyderabad	16	5	Sachin Baby	SR Watson
150435	Sunrisers Hyderabad	16	6	SR Watson	Sachin Baby
150436	Sunrisers Hyderabad	17	1	SR Watson	Sachin Baby
150437	Sunrisers Hyderabad	17	2	SR Watson	Sachin Baby
150438	Sunrisers Hyderabad	17	3	SR Watson	Sachin Baby
150439	Sunrisers Hyderabad	17	4	Sachin Baby	STR Binny
150440	Sunrisers Hyderabad	17	5	STR Binny	Sachin Baby
150441	Sunrisers Hyderabad	17	6	STR Binny	Sachin Baby
150442	Sunrisers Hyderabad	18	1	STR Binny	Sachin Baby
150443	Sunrisers Hyderabad	18	2	STR Binny	Sachin Baby
150444	Sunrisers Hyderabad	18	3	Sachin Baby	STR Binny
150445	Sunrisers Hyderabad	18	4	STR Binny	Sachin Baby
150446	Sunrisers Hyderabad	18	5	STR Binny	Sachin Baby
150447	Sunrisers Hyderabad	18	6	Sachin Baby	STR Binny
150448	Sunrisers Hyderabad	19	1	STR Binny	Sachin Baby
150449	Sunrisers Hyderabad	19	2	CJ Jordan	Sachin Baby
150450	Sunrisers Hyderabad	19	3	CJ Jordan	Sachin Baby
150451	Sunrisers Hyderabad	19	4	CJ Jordan	Sachin Baby
150452	Sunrisers Hyderabad	19	5	Sachin Baby	CJ Jordan
150453	Sunrisers Hyderabad	19	6	Sachin Baby	CJ Jordan
150454	Sunrisers Hyderabad	20	1	CJ Jordan	Sachin Baby
150455	Sunrisers Hyderabad	20	2	Sachin Baby	CJ Jordan
150456	Sunrisers Hyderabad	20	3	Sachin Baby	CJ Jordan
150457	Sunrisers Hyderabad	20	4	Iqbal Abdulla	Sachin Baby

150458	Sunrisers Hyderabad	20	5	Sachin Baby	Iqbal Abdulla
150459	Sunrisers Hyderabad	20	6	Iqbal Abdulla	Sachin Baby

	bowler	is_super_over	...	bye_runs	legbye_runs	\
0	TS Mills	0	...	0	0	
1	TS Mills	0	...	0	0	
2	TS Mills	0	...	0	0	
3	TS Mills	0	...	0	0	
4	TS Mills	0	...	0	0	
5	TS Mills	0	...	0	0	
6	TS Mills	0	...	0	1	
7	A Choudhary	0	...	0	0	
8	A Choudhary	0	...	0	0	
9	A Choudhary	0	...	0	0	
10	A Choudhary	0	...	0	0	
11	A Choudhary	0	...	0	0	
12	A Choudhary	0	...	0	0	
13	A Choudhary	0	...	0	0	
14	TS Mills	0	...	0	0	
15	TS Mills	0	...	0	0	
16	TS Mills	0	...	0	0	
17	TS Mills	0	...	0	0	
18	TS Mills	0	...	0	0	
19	TS Mills	0	...	0	0	
20	YS Chahal	0	...	0	0	
21	YS Chahal	0	...	0	0	
22	YS Chahal	0	...	0	0	
23	YS Chahal	0	...	0	0	
24	YS Chahal	0	...	0	0	
25	YS Chahal	0	...	0	0	
26	S Aravind	0	...	0	0	
27	S Aravind	0	...	0	0	
28	S Aravind	0	...	0	0	
29	S Aravind	0	...	0	0	
...	...	...	...	...	...	...
150430	BCJ Cutting	0	...	0	0	
150431	BCJ Cutting	0	...	0	0	
150432	BCJ Cutting	0	...	0	0	
150433	BCJ Cutting	0	...	0	0	
150434	BCJ Cutting	0	...	0	0	
150435	BCJ Cutting	0	...	0	0	
150436	Mustafizur Rahman	0	...	0	0	
150437	Mustafizur Rahman	0	...	0	0	
150438	Mustafizur Rahman	0	...	0	0	
150439	Mustafizur Rahman	0	...	0	0	
150440	Mustafizur Rahman	0	...	0	0	
150441	Mustafizur Rahman	0	...	0	0	
150442	B Kumar	0	...	0	0	

150443	B Kumar	0	...	0	0
150444	B Kumar	0	...	0	0
150445	B Kumar	0	...	0	0
150446	B Kumar	0	...	0	1
150447	B Kumar	0	...	0	0
150448	Mustafizur Rahman	0	...	0	0
150449	Mustafizur Rahman	0	...	0	0
150450	Mustafizur Rahman	0	...	0	0
150451	Mustafizur Rahman	0	...	0	1
150452	Mustafizur Rahman	0	...	0	0
150453	Mustafizur Rahman	0	...	0	0
150454	B Kumar	0	...	0	0
150455	B Kumar	0	...	0	0
150456	B Kumar	0	...	0	0
150457	B Kumar	0	...	0	1
150458	B Kumar	0	...	0	0
150459	B Kumar	0	...	0	0

	noball_runs	penalty_runs	batsman_runs	extra_runs	total_runs	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	4	0	4	
3	0	0	0	0	0	
4	0	0	0	2	2	
5	0	0	0	0	0	
6	0	0	0	1	1	
7	0	0	1	0	1	
8	0	0	4	0	4	
9	1	0	0	1	1	
10	0	0	6	0	6	
11	0	0	0	0	0	
12	0	0	0	0	0	
13	0	0	4	0	4	
14	0	0	1	0	1	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	0	0	3	0	3	
18	0	0	1	0	1	
19	0	0	1	0	1	
20	0	0	0	0	0	
21	0	0	1	0	1	
22	0	0	0	0	0	
23	0	0	1	0	1	
24	0	0	1	0	1	
25	0	0	1	0	1	
26	0	0	1	0	1	
27	0	0	1	0	1	
28	0	0	1	0	1	

29	0	0	2	0	2
...	...	...	...	...	...
150430	0	0	1	0	1
150431	0	0	1	0	1
150432	0	0	0	0	0
150433	0	0	0	0	0
150434	0	0	1	0	1
150435	0	0	1	0	1
150436	0	0	0	0	0
150437	0	0	2	0	2
150438	0	0	0	0	0
150439	0	0	1	0	1
150440	0	0	6	0	6
150441	0	0	1	0	1
150442	0	0	0	0	0
150443	0	0	1	0	1
150444	0	0	1	0	1
150445	0	0	0	0	0
150446	0	0	0	1	1
150447	0	0	4	0	4
150448	0	0	1	0	1
150449	0	0	2	0	2
150450	0	0	0	0	0
150451	0	0	0	1	1
150452	0	0	2	0	2
150453	0	0	6	0	6
150454	0	0	1	0	1
150455	0	0	2	0	2
150456	0	0	0	0	0
150457	0	0	0	1	1
150458	0	0	1	0	1
150459	0	0	4	0	4

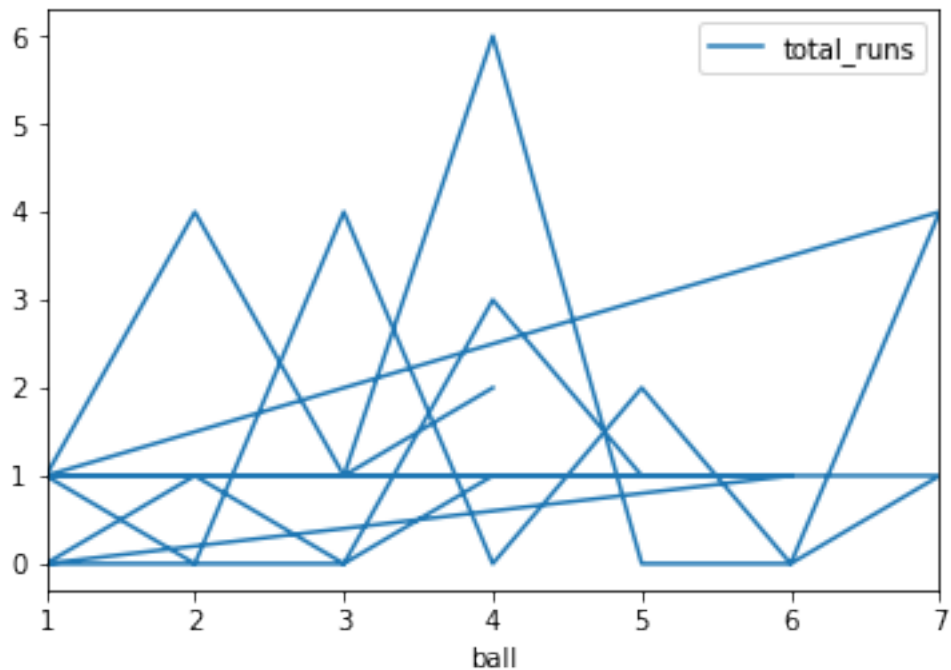
	player_dismissed	dismissal_kind	fielder
0	NaN	NaN	NaN
1	NaN	NaN	NaN
2	NaN	NaN	NaN
3	NaN	NaN	NaN
4	NaN	NaN	NaN
5	NaN	NaN	NaN
6	NaN	NaN	NaN
7	NaN	NaN	NaN
8	NaN	NaN	NaN
9	NaN	NaN	NaN
10	NaN	NaN	NaN
11	DA Warner	caught	Mandeep Singh
12	NaN	NaN	NaN
13	NaN	NaN	NaN

14	NaN	NaN	NaN
15	NaN	NaN	NaN
16	NaN	NaN	NaN
17	NaN	NaN	NaN
18	NaN	NaN	NaN
19	NaN	NaN	NaN
20	NaN	NaN	NaN
21	NaN	NaN	NaN
22	NaN	NaN	NaN
23	NaN	NaN	NaN
24	NaN	NaN	NaN
25	NaN	NaN	NaN
26	NaN	NaN	NaN
27	NaN	NaN	NaN
28	NaN	NaN	NaN
29	NaN	NaN	NaN
...	...	...	...
150430	NaN	NaN	NaN
150431	NaN	NaN	NaN
150432	KL Rahul	bowled	NaN
150433	NaN	NaN	NaN
150434	NaN	NaN	NaN
150435	NaN	NaN	NaN
150436	NaN	NaN	NaN
150437	NaN	NaN	NaN
150438	SR Watson	caught	MC Henriques
150439	NaN	NaN	NaN
150440	NaN	NaN	NaN
150441	NaN	NaN	NaN
150442	NaN	NaN	NaN
150443	NaN	NaN	NaN
150444	NaN	NaN	NaN
150445	NaN	NaN	NaN
150446	NaN	NaN	NaN
150447	NaN	NaN	NaN
150448	STR Binny	run out	DJ Hooda
150449	NaN	NaN	NaN
150450	NaN	NaN	NaN
150451	NaN	NaN	NaN
150452	NaN	NaN	NaN
150453	NaN	NaN	NaN
150454	NaN	NaN	NaN
150455	NaN	NaN	NaN
150456	CJ Jordan	run out	NV Ojha
150457	NaN	NaN	NaN
150458	NaN	NaN	NaN
150459	NaN	NaN	NaN

[150460 rows x 21 columns]

```
In [5]: %matplotlib inline
        #plot for runs on a particular ball in an over
        data.head(30).plot(x='ball',y='total_runs')
```

Out[5]: <matplotlib.axes.\_subplots.AxesSubplot at 0x2872329b898>



```
In [6]: #data where it was the first over
        data[data['over']==1]
```

Out[6]:

	match_id	inning	batting_team \
0	1	1	Sunrisers Hyderabad
1	1	1	Sunrisers Hyderabad
2	1	1	Sunrisers Hyderabad
3	1	1	Sunrisers Hyderabad
4	1	1	Sunrisers Hyderabad
5	1	1	Sunrisers Hyderabad
6	1	1	Sunrisers Hyderabad
125	1	2	Royal Challengers Bangalore
126	1	2	Royal Challengers Bangalore
127	1	2	Royal Challengers Bangalore
128	1	2	Royal Challengers Bangalore
129	1	2	Royal Challengers Bangalore
130	1	2	Royal Challengers Bangalore



248	2	1	Mumbai Indians
249	2	1	Mumbai Indians
250	2	1	Mumbai Indians
251	2	1	Mumbai Indians
252	2	1	Mumbai Indians
253	2	1	Mumbai Indians
254	2	1	Mumbai Indians
373	2	2	Rising Pune Supergiant
374	2	2	Rising Pune Supergiant
375	2	2	Rising Pune Supergiant
376	2	2	Rising Pune Supergiant
377	2	2	Rising Pune Supergiant
378	2	2	Rising Pune Supergiant
379	2	2	Rising Pune Supergiant
495	3	1	Gujarat Lions
496	3	1	Gujarat Lions
497	3	1	Gujarat Lions
...	...	...	...
149849	634	2	Kolkata Knight Riders
149850	634	2	Kolkata Knight Riders
149851	634	2	Kolkata Knight Riders
149852	634	2	Kolkata Knight Riders
149853	634	2	Kolkata Knight Riders
149968	635	1	Gujarat Lions
149969	635	1	Gujarat Lions
149970	635	1	Gujarat Lions
149971	635	1	Gujarat Lions
149972	635	1	Gujarat Lions
149973	635	1	Gujarat Lions
149974	635	1	Gujarat Lions
150093	635	2	Sunrisers Hyderabad
150094	635	2	Sunrisers Hyderabad
150095	635	2	Sunrisers Hyderabad
150096	635	2	Sunrisers Hyderabad
150097	635	2	Sunrisers Hyderabad
150098	635	2	Sunrisers Hyderabad
150210	636	1	Sunrisers Hyderabad
150211	636	1	Sunrisers Hyderabad
150212	636	1	Sunrisers Hyderabad
150213	636	1	Sunrisers Hyderabad
150214	636	1	Sunrisers Hyderabad
150215	636	1	Sunrisers Hyderabad
150336	636	2	Royal Challengers Bangalore
150337	636	2	Royal Challengers Bangalore
150338	636	2	Royal Challengers Bangalore
150339	636	2	Royal Challengers Bangalore
150340	636	2	Royal Challengers Bangalore
150341	636	2	Royal Challengers Bangalore

	bowling_team	over	ball	batsman	non_striker \
0	Royal Challengers Bangalore	1	1	DA Warner	S Dhawan
1	Royal Challengers Bangalore	1	2	DA Warner	S Dhawan
2	Royal Challengers Bangalore	1	3	DA Warner	S Dhawan
3	Royal Challengers Bangalore	1	4	DA Warner	S Dhawan
4	Royal Challengers Bangalore	1	5	DA Warner	S Dhawan
5	Royal Challengers Bangalore	1	6	S Dhawan	DA Warner
6	Royal Challengers Bangalore	1	7	S Dhawan	DA Warner
125	Sunrisers Hyderabad	1	1	CH Gayle	Mandeep Singh
126	Sunrisers Hyderabad	1	2	Mandeep Singh	CH Gayle
127	Sunrisers Hyderabad	1	3	Mandeep Singh	CH Gayle
128	Sunrisers Hyderabad	1	4	Mandeep Singh	CH Gayle
129	Sunrisers Hyderabad	1	5	Mandeep Singh	CH Gayle
130	Sunrisers Hyderabad	1	6	Mandeep Singh	CH Gayle
248	Rising Pune Supergiant	1	1	PA Patel	JC Buttler
249	Rising Pune Supergiant	1	2	PA Patel	JC Buttler
250	Rising Pune Supergiant	1	3	PA Patel	JC Buttler
251	Rising Pune Supergiant	1	4	JC Buttler	PA Patel
252	Rising Pune Supergiant	1	5	PA Patel	JC Buttler
253	Rising Pune Supergiant	1	6	PA Patel	JC Buttler
254	Rising Pune Supergiant	1	7	PA Patel	JC Buttler
373	Mumbai Indians	1	1	AM Rahane	MA Agarwal
374	Mumbai Indians	1	2	MA Agarwal	AM Rahane
375	Mumbai Indians	1	3	MA Agarwal	AM Rahane
376	Mumbai Indians	1	4	MA Agarwal	AM Rahane
377	Mumbai Indians	1	5	AM Rahane	MA Agarwal
378	Mumbai Indians	1	6	AM Rahane	MA Agarwal
379	Mumbai Indians	1	7	AM Rahane	MA Agarwal
495	Kolkata Knight Riders	1	1	JJ Roy	BB McCullum
496	Kolkata Knight Riders	1	2	JJ Roy	BB McCullum
497	Kolkata Knight Riders	1	3	JJ Roy	BB McCullum
...	...	...	...	...	...
149849	Sunrisers Hyderabad	1	2	G Gambhir	RV Uthappa
149850	Sunrisers Hyderabad	1	3	G Gambhir	RV Uthappa
149851	Sunrisers Hyderabad	1	4	RV Uthappa	G Gambhir
149852	Sunrisers Hyderabad	1	5	RV Uthappa	G Gambhir
149853	Sunrisers Hyderabad	1	6	RV Uthappa	G Gambhir
149968	Sunrisers Hyderabad	1	1	ER Dwivedi	BB McCullum
149969	Sunrisers Hyderabad	1	2	BB McCullum	ER Dwivedi
149970	Sunrisers Hyderabad	1	3	ER Dwivedi	BB McCullum
149971	Sunrisers Hyderabad	1	4	ER Dwivedi	BB McCullum
149972	Sunrisers Hyderabad	1	5	ER Dwivedi	BB McCullum
149973	Sunrisers Hyderabad	1	6	ER Dwivedi	BB McCullum
149974	Sunrisers Hyderabad	1	7	ER Dwivedi	BB McCullum
150093	Gujarat Lions	1	1	DA Warner	S Dhawan
150094	Gujarat Lions	1	2	DA Warner	S Dhawan
150095	Gujarat Lions	1	3	DA Warner	S Dhawan

150096	Gujarat Lions	1	4	S Dhawan	DA Warner
150097	Gujarat Lions	1	5	S Dhawan	DA Warner
150098	Gujarat Lions	1	6	S Dhawan	DA Warner
150210	Royal Challengers Bangalore	1	1	DA Warner	S Dhawan
150211	Royal Challengers Bangalore	1	2	S Dhawan	DA Warner
150212	Royal Challengers Bangalore	1	3	DA Warner	S Dhawan
150213	Royal Challengers Bangalore	1	4	DA Warner	S Dhawan
150214	Royal Challengers Bangalore	1	5	S Dhawan	DA Warner
150215	Royal Challengers Bangalore	1	6	S Dhawan	DA Warner
150336	Sunrisers Hyderabad	1	1	CH Gayle	V Kohli
150337	Sunrisers Hyderabad	1	2	CH Gayle	V Kohli
150338	Sunrisers Hyderabad	1	3	V Kohli	CH Gayle
150339	Sunrisers Hyderabad	1	4	V Kohli	CH Gayle
150340	Sunrisers Hyderabad	1	5	V Kohli	CH Gayle
150341	Sunrisers Hyderabad	1	6	V Kohli	CH Gayle

	bowler	is_super_over	...	bye_runs	legbye_runs	noball_runs	\
0	TS Mills	0	...	0	0	0	
1	TS Mills	0	...	0	0	0	
2	TS Mills	0	...	0	0	0	
3	TS Mills	0	...	0	0	0	
4	TS Mills	0	...	0	0	0	
5	TS Mills	0	...	0	0	0	
6	TS Mills	0	...	0	1	0	
125	A Nehra	0	...	0	0	0	
126	A Nehra	0	...	0	0	0	
127	A Nehra	0	...	0	0	0	
128	A Nehra	0	...	0	0	0	
129	A Nehra	0	...	0	0	0	
130	A Nehra	0	...	0	0	0	
248	AB Dinda	0	...	0	0	0	
249	AB Dinda	0	...	0	0	0	
250	AB Dinda	0	...	0	0	0	
251	AB Dinda	0	...	0	0	0	
252	AB Dinda	0	...	0	0	0	
253	AB Dinda	0	...	0	0	0	
254	AB Dinda	0	...	0	0	0	
373	TG Southee	0	...	0	0	0	
374	TG Southee	0	...	0	0	0	
375	TG Southee	0	...	0	0	0	
376	TG Southee	0	...	0	0	0	
377	TG Southee	0	...	0	0	0	
378	TG Southee	0	...	0	0	0	
379	TG Southee	0	...	0	0	0	
495	TA Boult	0	...	0	0	0	
496	TA Boult	0	...	0	0	0	
497	TA Boult	0	...	0	0	0	
...	...	...	...	...	...	...	

149849	B Kumar	0	...	0	0	0
149850	B Kumar	0	...	0	0	0
149851	B Kumar	0	...	0	0	0
149852	B Kumar	0	...	0	0	0
149853	B Kumar	0	...	0	0	0
149968	B Kumar	0	...	0	0	0
149969	B Kumar	0	...	0	0	0
149970	B Kumar	0	...	0	0	0
149971	B Kumar	0	...	0	0	0
149972	B Kumar	0	...	0	0	0
149973	B Kumar	0	...	0	0	0
149974	B Kumar	0	...	0	0	0
150093	P Kumar	0	...	0	0	0
150094	P Kumar	0	...	0	0	0
150095	P Kumar	0	...	0	0	0
150096	P Kumar	0	...	0	0	0
150097	P Kumar	0	...	0	0	0
150098	P Kumar	0	...	0	1	0
150210	S Aravind	0	...	0	0	0
150211	S Aravind	0	...	0	0	0
150212	S Aravind	0	...	0	0	0
150213	S Aravind	0	...	0	0	0
150214	S Aravind	0	...	0	0	0
150215	S Aravind	0	...	0	0	0
150336	B Kumar	0	...	0	0	0
150337	B Kumar	0	...	0	1	0
150338	B Kumar	0	...	0	0	0
150339	B Kumar	0	...	0	0	0
150340	B Kumar	0	...	0	0	0
150341	B Kumar	0	...	0	0	0

	penalty_runs	batsman_runs	extra_runs	total_runs	player_dismissed \
0	0	0	0	0	NaN
1	0	0	0	0	NaN
2	0	4	0	4	NaN
3	0	0	0	0	NaN
4	0	0	2	2	NaN
5	0	0	0	0	NaN
6	0	0	1	1	NaN
125	0	1	0	1	NaN
126	0	0	0	0	NaN
127	0	0	0	0	NaN
128	0	2	0	2	NaN
129	0	4	0	4	NaN
130	0	4	0	4	NaN
248	0	0	1	1	NaN
249	0	0	0	0	NaN
250	0	1	0	1	NaN

251	0	5	0	5	NaN
252	0	4	0	4	NaN
253	0	0	0	0	NaN
254	0	0	0	0	NaN
373	0	1	0	1	NaN
374	0	4	0	4	NaN
375	0	0	1	1	NaN
376	0	1	0	1	NaN
377	0	0	0	0	NaN
378	0	0	0	0	NaN
379	0	1	0	1	NaN
495	0	0	0	0	NaN
496	0	4	0	4	NaN
497	0	0	0	0	NaN
...	...	...	...	...	...
149849	0	0	0	0	NaN
149850	0	1	0	1	NaN
149851	0	0	0	0	NaN
149852	0	0	0	0	NaN
149853	0	1	0	1	NaN
149968	0	1	0	1	NaN
149969	0	1	0	1	NaN
149970	0	0	0	0	NaN
149971	0	4	0	4	NaN
149972	0	0	0	0	NaN
149973	0	0	1	1	NaN
149974	0	0	0	0	ER Dwivedi
150093	0	4	0	4	NaN
150094	0	0	0	0	NaN
150095	0	1	0	1	NaN
150096	0	0	0	0	NaN
150097	0	0	0	0	NaN
150098	0	0	1	1	NaN
150210	0	1	0	1	NaN
150211	0	1	0	1	NaN
150212	0	0	0	0	NaN
150213	0	1	0	1	NaN
150214	0	0	0	0	NaN
150215	0	4	0	4	NaN
150336	0	0	0	0	NaN
150337	0	0	1	1	NaN
150338	0	0	0	0	NaN
150339	0	0	0	0	NaN
150340	0	4	0	4	NaN
150341	0	0	0	0	NaN

	dismissal_kind	fielder
0	NaN	NaN

1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
5	NaN	NaN
6	NaN	NaN
125	NaN	NaN
126	NaN	NaN
127	NaN	NaN
128	NaN	NaN
129	NaN	NaN
130	NaN	NaN
248	NaN	NaN
249	NaN	NaN
250	NaN	NaN
251	NaN	NaN
252	NaN	NaN
253	NaN	NaN
254	NaN	NaN
373	NaN	NaN
374	NaN	NaN
375	NaN	NaN
376	NaN	NaN
377	NaN	NaN
378	NaN	NaN
379	NaN	NaN
495	NaN	NaN
496	NaN	NaN
497	NaN	NaN
...	...	...
149849	NaN	NaN
149850	NaN	NaN
149851	NaN	NaN
149852	NaN	NaN
149853	NaN	NaN
149968	NaN	NaN
149969	NaN	NaN
149970	NaN	NaN
149971	NaN	NaN
149972	NaN	NaN
149973	NaN	NaN
149974	caught	TA Boulton
150093	NaN	NaN
150094	NaN	NaN
150095	NaN	NaN
150096	NaN	NaN
150097	NaN	NaN
150098	NaN	NaN

150210	NaN	NaN
150211	NaN	NaN
150212	NaN	NaN
150213	NaN	NaN
150214	NaN	NaN
150215	NaN	NaN
150336	NaN	NaN
150337	NaN	NaN
150338	NaN	NaN
150339	NaN	NaN
150340	NaN	NaN
150341	NaN	NaN

[8092 rows x 21 columns]

```
In [16]: #list of batsmen who played the most no. of balls in the first over
data[data['over']==1]['batsman'].value_counts()
```

```
Out[16]: CH Gayle          335
         G Gambhir         327
         DA Warner         321
         PA Patel          297
         AM Rahane         296
         AC Gilchrist       286
         M Vijay           281
         S Dhawan          274
         DR Smith          268
         V Sehwag          255
         BB McCullum        244
         RV Uthappa         242
         JH Kallis          183
         R Dravid           165
         MEK Hussey         161
         SR Tendulkar       130
         V Kohli            129
         MA Agarwal         115
         LMP Simmons        114
         AJ Finch           114
         SC Ganguly         108
         SE Marsh           108
         ST Jayasuriya      106
         MS Bisla           101
         MK Pandey          101
         SR Watson           99
         Q de Kock           99
         DPMD Jayawardene    92
         Mandeep Singh       91
         JD Ryder            88
```

```

...
Shahid Afridi      3
KA Pollard         3
R McLaren          3
AB Barath          3
Azhar Mahmood      3
LA Carseldine      3
NLTC Perera        2
M Rawat            2
C de Grandhomme    2
MV Boucher         2
AB McDonald        2
JP Faulkner        2
J Botha           2
Shakib Al Hasan    2
Vishnu Vinod       2
Anirudh Singh      2
R Bishnoi          1
WD Parnell         1
A Mukund           1
RE van der Merwe   1
DA Miller          1
MC Henriques       1
S Sriram           1
DB Das             1
AA Jhunjunwala     1
JA Morkel          1
MN van Wyk         1
CA Ingram          1
VH Zol             1
BJ Rohrer          1
Name: batsman, Length: 175, dtype: int64

```

```

In [20]: #total runs scored in the first over of both innings in the match with id=1
run=data[(data['match_id']==1) & (data['over']==1)][['total_runs']].sum()
run

```

```

Out[20]: 18

```

```

In [10]: #graph to show no. of times a particular over was bowled in the whole dataset
(data['over'].value_counts()/6).plot(kind='bar')

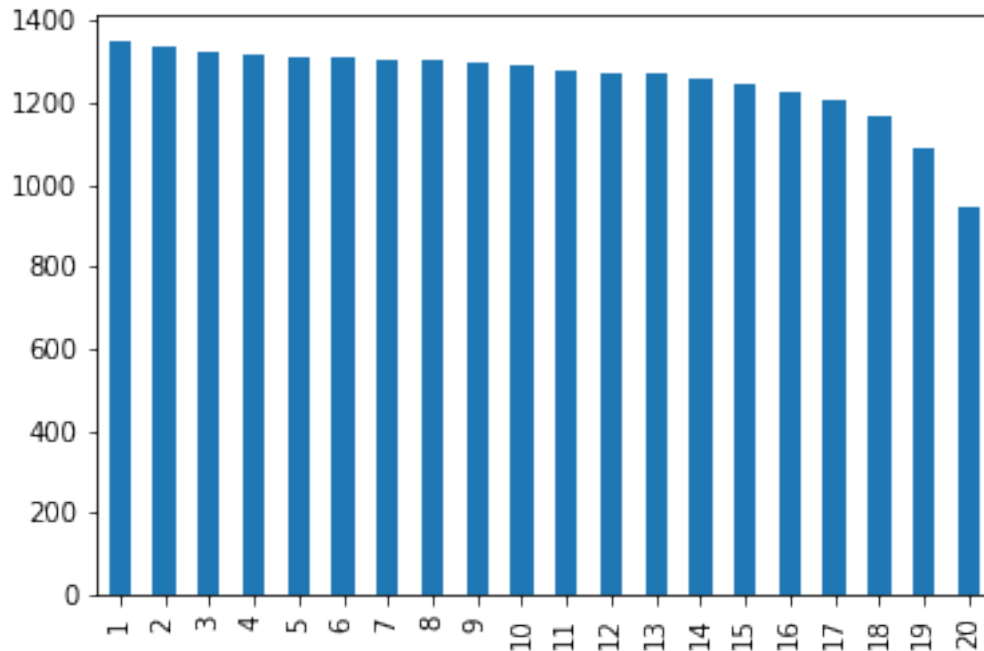
```

```

Out[10]: <matplotlib.axes._subplots.AxesSubplot at 0x28723174f98>

```





```
In [24]: match=pd.read_csv('matches.csv')
```

```
In [12]: match.head()
```

```
Out[12]:
```

	id	season	city	date	team1 \
0	1	2017	Hyderabad	2017-04-05	Sunrisers Hyderabad
1	2	2017	Pune	2017-04-06	Mumbai Indians
2	3	2017	Rajkot	2017-04-07	Gujarat Lions
3	4	2017	Indore	2017-04-08	Rising Pune Supergiant
4	5	2017	Bangalore	2017-04-08	Royal Challengers Bangalore

	team2	toss_winner	toss_decision \
0	Royal Challengers Bangalore	Royal Challengers Bangalore	field
1	Rising Pune Supergiant	Rising Pune Supergiant	field
2	Kolkata Knight Riders	Kolkata Knight Riders	field
3	Kings XI Punjab	Kings XI Punjab	field
4	Delhi Daredevils	Royal Challengers Bangalore	bat

	result	dl_applied	winner	win_by_runs \
0	normal	0	Sunrisers Hyderabad	35
1	normal	0	Rising Pune Supergiant	0
2	normal	0	Kolkata Knight Riders	0
3	normal	0	Kings XI Punjab	0
4	normal	0	Royal Challengers Bangalore	15

	win_by_wickets	player_of_match	venue \
--	----------------	-----------------	---------

0	0	Yuvraj Singh	Rajiv Gandhi International Stadium, Uppal
1	7	SPD Smith	Maharashtra Cricket Association Stadium
2	10	CA Lynn	Saurashtra Cricket Association Stadium
3	6	GJ Maxwell	Holkar Cricket Stadium
4	0	KM Jadhav	M Chinnaswamy Stadium

	umpire1	umpire2	umpire3
0	AY Dandekar	NJ Llong	NaN
1	A Nand Kishore	S Ravi	NaN
2	Nitin Menon	CK Nandan	NaN
3	AK Chaudhary	C Shamshuddin	NaN
4	NaN	NaN	NaN

```
In [13]: #list for no. of times a player was man of the match
match['player_of_match'].value_counts()
```

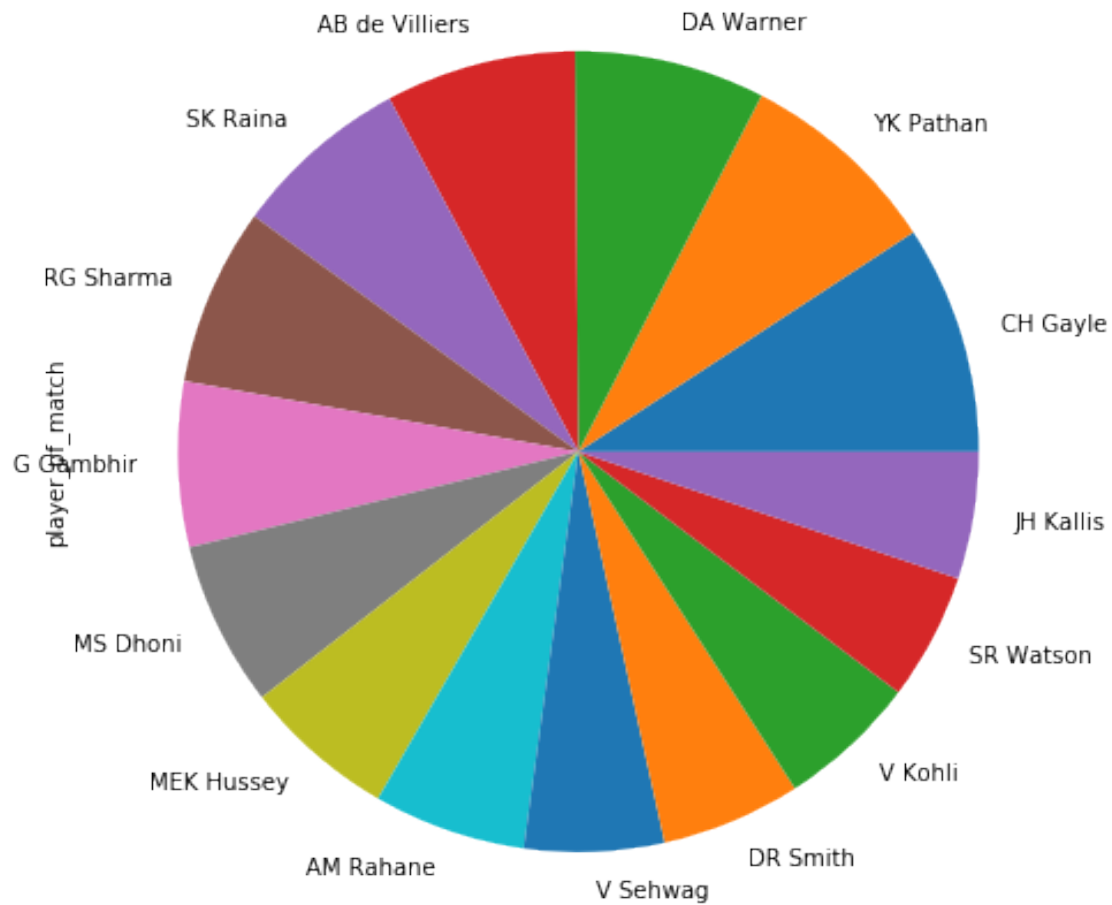
```
Out[13]: CH Gayle          18
YK Pathan                16
DA Warner                15
AB de Villiers          15
SK Raina                 14
RG Sharma                14
G Gambhir                13
MS Dhoni                 13
MEK Hussey               12
AM Rahane                12
V Sehwag                 11
DR Smith                 11
V Kohli                  11
SR Watson                10
JH Kallis                10
SE Marsh                 9
A Mishra                 9
KA Pollard               9
SR Tendulkar             8
AT Rayudu                7
AC Gilchrist             7
RV Uthappa               7
RA Jadeja                7
SP Narine                6
UT Yadav                 6
BJ Hodge                 6
AD Russell               6
Harbhajan Singh          6
A Nehra                  6
M Vijay                  6
..
AD Mathews               1
```

HV Patel	1
Mustafizur Rahman	1
SB Jakati	1
RE Levi	1
MA Agarwal	1
HH Gibbs	1
J Botha	1
P Parameswaran	1
MA Starc	1
TA Boult	1
KV Sharma	1
LH Ferguson	1
S Nadeem	1
R Ashwin	1
JEC Franklin	1
MS Bisla	1
Q de Kock	1
S Anirudha	1
MF Maharoor	1
WPUJC Vaas	1
AP Tare	1
GJ Bailey	1
S Badrinath	1
TL Suman	1
MN Samuels	1
R McLaren	1
Mohammed Siraj	1
NV Ojha	1
SA Asnodkar	1

Name: player\_of\_match, Length: 201, dtype: int64

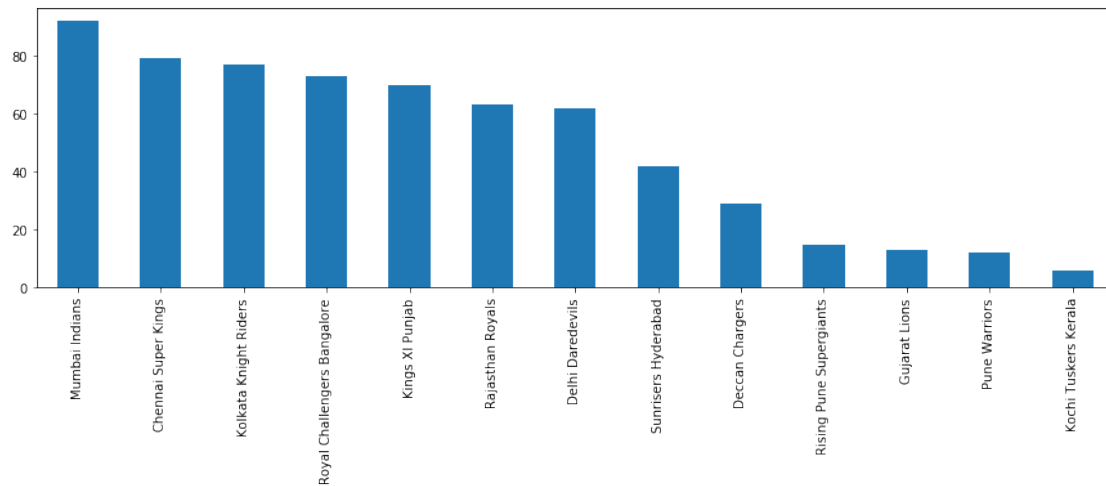
```
In [14]: #pie chart for top 15 player of the match
match['player_of_match'].value_counts().head(15).plot(kind='pie',figsize=(8,8))
```

```
Out[14]: <matplotlib.axes._subplots.AxesSubplot at 0x287232f9cf8>
```



```
In [25]: #bar graph for no. of times a team was the winner of the match
         match['winner'].value_counts().plot(kind='bar',figsize=(15,4))
```

```
Out[25]: <matplotlib.axes._subplots.AxesSubplot at 0x28723718a90>
```



```
In [26]: #which city had most matches
match['city'].value_counts()
```

```
Out[26]: Mumbai      85
Bangalore      66
Kolkata        61
Delhi          60
Hyderabad      49
Chennai        48
Chandigarh     46
Jaipur         33
Pune           32
Durban         15
Ahmedabad      12
Centurion      12
Visakhapatnam  11
Rajkot         10
Dharamsala     9
Johannesburg   8
Ranchi         7
Cuttack        7
Port Elizabeth 7
Cape Town      7
Abu Dhabi      7
Sharjah        6
Raipur         6
Indore         5
Kochi          5
Kanpur         4
Nagpur         3
Kimberley      3
```

```

East London      3
Bloemfontein     2
Name: city, dtype: int64

```

```

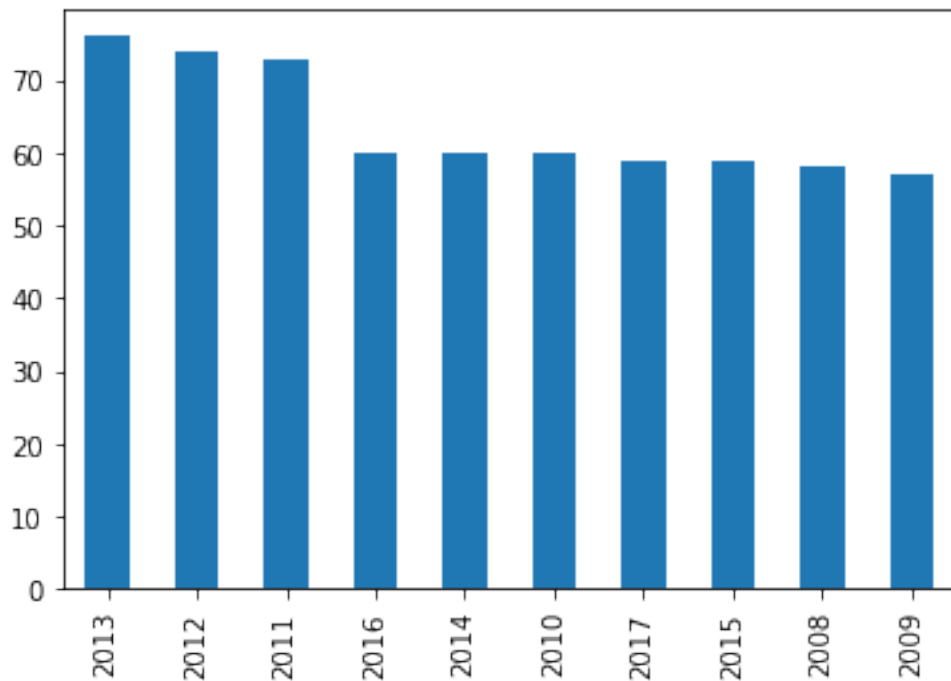
In [27]: #bar graph for no.matches in each season
match['season'].value_counts().plot(kind="bar")

```

```

Out[27]: <matplotlib.axes._subplots.AxesSubplot at 0x287237e20f0>

```



```

In [48]: m=match['toss_winner']
m

```

```

Out[48]: 0      Sunrisers Hyderabad
1      Rising Pune Supergiants
2      Kolkata Knight Riders
3      Kings XI Punjab
4      Royal Challengers Bangalore
5      Sunrisers Hyderabad
6      Mumbai Indians
7      Kings XI Punjab
8      Delhi Daredevils
9      Mumbai Indians
10     Kolkata Knight Riders
11     Mumbai Indians
12     Gujarat Lions

```

13	Kolkata Knight Riders
14	Delhi Daredevils
15	Mumbai Indians
16	Rising Pune Supergiants
17	Kolkata Knight Riders
18	Sunrisers Hyderabad
19	Royal Challengers Bangalore
20	Sunrisers Hyderabad
21	Mumbai Indians
22	Gujarat Lions
23	Mumbai Indians
24	Rising Pune Supergiants
25	Kings XI Punjab
26	Kolkata Knight Riders
27	Rising Pune Supergiants
28	Kolkata Knight Riders
29	Gujarat Lions
	...
606	Delhi Daredevils
607	Kolkata Knight Riders
608	Rising Pune Supergiants
609	Sunrisers Hyderabad
610	Royal Challengers Bangalore
611	Kings XI Punjab
612	Sunrisers Hyderabad
613	Gujarat Lions
614	Royal Challengers Bangalore
615	Sunrisers Hyderabad
616	Mumbai Indians
617	Delhi Daredevils
618	Kings XI Punjab
619	Royal Challengers Bangalore
620	Kolkata Knight Riders
621	Sunrisers Hyderabad
622	Mumbai Indians
623	Royal Challengers Bangalore
624	Rising Pune Supergiants
625	Royal Challengers Bangalore
626	Gujarat Lions
627	Delhi Daredevils
628	Rising Pune Supergiants
629	Gujarat Lions
630	Kolkata Knight Riders
631	Royal Challengers Bangalore
632	Royal Challengers Bangalore
633	Sunrisers Hyderabad
634	Sunrisers Hyderabad
635	Sunrisers Hyderabad

```
Name: toss_winner, Length: 636, dtype: object
```

```
In [73]: u1=match['umpire1']  
         l1=list(u1)  
  
         u2=match['umpire2']  
         l2=list(u2)  
  
         l=l1+l2  
  
         s=max(l,key=l.count)  
  
         num=l.count(s)  
  
         print(s,num)
```

```
SJA Taufel 108
```

```
In [ ]:
```

```
In [ ]:
```