

Pandas_real

July 9, 2024

Understanding Pandas

```
[3]: import pandas as pd
```

```
[5]: import numpy as np
```

```
[7]: data = pd.read_csv('matches - matches.csv')
```

```
[9]: data
```

```
[9]:
```

	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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
..
631	normal	0	Royal Challengers Bangalore	0
632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Sunrisers Hyderabad	22
634	normal	0	Sunrisers Hyderabad	0
635	normal	0	Sunrisers Hyderabad	8

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN

```
634      CK Nandan      NaN
635     BNJ Oxenford     NaN
```

```
[636 rows x 18 columns]
```

```
[10]: data.head(3)
```

```
[10]:   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

      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

      result  dl_applied      winner  win_by_runs  win_by_wickets \
0  normal      0    Sunrisers Hyderabad      35      0
1  normal      0  Rising Pune Supergiant      0      7
2  normal      0    Kolkata Knight Riders      0     10

      player_of_match      venue      umpire1 \
0    Yuvraj Singh  Rajiv Gandhi International Stadium, Uppal    AY Dandekar
1      SPD Smith    Maharashtra Cricket Association Stadium  A Nand Kishore
2      CA Lynn    Saurashtra Cricket Association Stadium    Nitin Menon

      umpire2  umpire3
0    NJ Llong      NaN
1      S Ravi      NaN
2    CK Nandan      NaN
```

```
[11]: data.tail(600)
```

```
[11]:   id  season      city      date      team1 \
36   37    2017    Mumbai  2017-05-01  Royal Challengers Bangalore
37   38    2017      Pune  2017-05-01    Gujarat Lions
38   39    2017    Delhi  2017-05-02    Sunrisers Hyderabad
39   40    2017   Kolkata  2017-05-03    Kolkata Knight Riders
40   41    2017    Delhi  2017-05-04    Gujarat Lions
..   ..   ...   ...   ...   ...
631  632    2016    Raipur  2016-05-22    Delhi Daredevils
632  633    2016  Bangalore  2016-05-24    Gujarat Lions
633  634    2016    Delhi  2016-05-25    Sunrisers Hyderabad
634  635    2016    Delhi  2016-05-27    Gujarat Lions
635  636    2016  Bangalore  2016-05-29    Sunrisers Hyderabad
```

	team2	toss_winner	toss_decision \
36	Mumbai Indians	Royal Challengers Bangalore	bat
37	Rising Pune Supergiant	Rising Pune Supergiant	field
38	Delhi Daredevils	Delhi Daredevils	field
39	Rising Pune Supergiant	Rising Pune Supergiant	field
40	Delhi Daredevils	Delhi Daredevils	field
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	bat

	result	dl_applied	winner	win_by_runs \
36	normal	0	Mumbai Indians	0
37	normal	0	Rising Pune Supergiant	0
38	normal	0	Delhi Daredevils	0
39	normal	0	Rising Pune Supergiant	0
40	normal	0	Delhi Daredevils	0
..
631	normal	0	Royal Challengers Bangalore	0
632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Sunrisers Hyderabad	22
634	normal	0	Sunrisers Hyderabad	0
635	normal	0	Sunrisers Hyderabad	8

	win_by_wickets	player_of_match \
36	5	RG Sharma
37	5	BA Stokes
38	6	Mohammed Shami
39	4	RA Tripathi
40	7	RR Pant
..
631	6	V Kohli
632	4	AB de Villiers
633	0	MC Henriques
634	4	DA Warner
635	0	BCJ Cutting

	venue	umpire1 \
36	Wankhede Stadium	AK Chaudhary
37	Maharashtra Cricket Association Stadium	M Erasmus
38	Feroz Shah Kotla	YC Barde
39	Eden Gardens	KN Ananthapadmanabhan
40	Feroz Shah Kotla	M Erasmus
..
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore

632	M Chinnaswamy Stadium	AK Chaudhary
633	Feroz Shah Kotla	M Erasmus
634	Feroz Shah Kotla	M Erasmus
635	M Chinnaswamy Stadium	HDPK Dharmasena

	umpire2	umpire3
36	CB Gaffaney	NaN
37	C Shamshuddin	NaN
38	Nitin Menon	NaN
39	A Nand Kishore	NaN
40	Nitin Menon	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN
634	CK Nandan	NaN
635	BNJ Oxenford	NaN

[600 rows x 18 columns]

```
[12]: data.shape
```

```
[12]: (636, 18)
```

```
[13]: data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 636 entries, 0 to 635
Data columns (total 18 columns):
#   Column                Non-Null Count  Dtype
---  -
0   id                     636 non-null    int64
1   season                 636 non-null    int64
2   city                   629 non-null    object
3   date                   636 non-null    object
4   team1                  636 non-null    object
5   team2                  636 non-null    object
6   toss_winner            636 non-null    object
7   toss_decision          636 non-null    object
8   result                 636 non-null    object
9   dl_applied             636 non-null    int64
10  winner                  633 non-null    object
11  win_by_runs            636 non-null    int64
12  win_by_wickets         636 non-null    int64
13  player_of_match        633 non-null    object
14  venue                   636 non-null    object
15  umpire1                 635 non-null    object
16  umpire2                 635 non-null    object
```

```

17 umpire3          0 non-null      float64
dtypes: float64(1), int64(5), object(12)
memory usage: 89.6+ KB

```

```
[14]: data.describe()
```

```

[14]:          id      season  dl_applied  win_by_runs  win_by_wickets  \
count  636.000000    636.000000  636.000000    636.000000    636.000000
mean    318.500000    2012.490566    0.025157    13.682390     3.372642
std     183.741666     2.773026    0.156726    23.908877     3.420338
min       1.000000    2008.000000    0.000000     0.000000     0.000000
25%     159.750000    2010.000000    0.000000     0.000000     0.000000
50%     318.500000    2012.000000    0.000000     0.000000     4.000000
75%     477.250000    2015.000000    0.000000    20.000000     7.000000
max      636.000000    2017.000000    1.000000   146.000000    10.000000

          umpire3
count          0.0
mean          NaN
std           NaN
min           NaN
25%           NaN
50%           NaN
75%           NaN
max           NaN

```

```
[15]: type(data)
```

```
[15]: pandas.core.frame.DataFrame
```

```
[16]: data
```

```

[16]:          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
..      ...      ...      ...      ...      ...
631    632    2016   Raipur    2016-05-22    Delhi Daredevils
632    633    2016  Bangalore  2016-05-24    Gujarat Lions
633    634    2016     Delhi    2016-05-25  Sunrisers Hyderabad
634    635    2016     Delhi    2016-05-27    Gujarat Lions
635    636    2016  Bangalore  2016-05-29  Sunrisers Hyderabad

          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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	

635 M Chinnaswamy Stadium HDPK Dharmasena

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN
634	CK Nandan	NaN
635	BNJ Oxenford	NaN

[636 rows x 18 columns]

```
[17]: a=(data['winner'])
```

```
[18]: a
```

```
[18]: 0      Sunrisers Hyderabad
      1      Rising Pune Supergiant
      2      Kolkata Knight Riders
      3      Kings XI Punjab
      4      Royal Challengers Bangalore
      ...
      631      Royal Challengers Bangalore
      632      Royal Challengers Bangalore
      633      Sunrisers Hyderabad
      634      Sunrisers Hyderabad
      635      Sunrisers Hyderabad
      Name: winner, Length: 636, dtype: object
```

```
[19]: data[['team1','team2','winner']]
```

```
[19]:
```

	team1	team2 \
0	Sunrisers Hyderabad	Royal Challengers Bangalore
1	Mumbai Indians	Rising Pune Supergiant
2	Gujarat Lions	Kolkata Knight Riders
3	Rising Pune Supergiant	Kings XI Punjab
4	Royal Challengers Bangalore	Delhi Daredevils
..
631	Delhi Daredevils	Royal Challengers Bangalore
632	Gujarat Lions	Royal Challengers Bangalore
633	Sunrisers Hyderabad	Kolkata Knight Riders
634	Gujarat Lions	Sunrisers Hyderabad


```
635          Sunrisers Hyderabad  Royal Challengers Bangalore
```

```

                                winner
0          Sunrisers Hyderabad
1      Rising Pune Supergiant
2      Kolkata Knight Riders
3          Kings XI Punjab
4  Royal Challengers Bangalore
..
631  Royal Challengers Bangalore
632  Royal Challengers Bangalore
633          Sunrisers Hyderabad
634          Sunrisers Hyderabad
635          Sunrisers Hyderabad
```

```
[636 rows x 3 columns]
```

```
[20]: data.iloc[[0,10,3]]
```

```
[20]:    id  season    city    date    team1 \
0    1    2017  Hyderabad  2017-04-05    Sunrisers Hyderabad
10   11    2017   Kolkata  2017-04-13    Kings XI Punjab
3    4    2017   Indore   2017-04-08  Rising Pune Supergiant

                                team2    toss_winner toss_decision \
0  Royal Challengers Bangalore  Royal Challengers Bangalore    field
10      Kolkata Knight Riders    Kolkata Knight Riders    field
3      Kings XI Punjab    Kings XI Punjab    field

    result  dl_applied    winner  win_by_runs  win_by_wickets \
0   normal          0  Sunrisers Hyderabad    35            0
10  normal          0  Kolkata Knight Riders     0            8
3   normal          0    Kings XI Punjab     0            6

    player_of_match    venue    umpire1 \
0   Yuvraj Singh  Rajiv Gandhi International Stadium, Uppal    AY Dandekar
10    SP Narine    Eden Gardens    A Deshmukh
3    GJ Maxwell    Holkar Cricket Stadium    AK Chaudhary

    umpire2  umpire3
0    NJ Llong    NaN
10    NJ Llong    NaN
3  C Shamshuddin    NaN
```

```
[21]: data.iloc[:, [4,5,7]]
```

```
[21]:
```

	team1	team2	toss_decision
0	Sunrisers Hyderabad	Royal Challengers Bangalore	field
1	Mumbai Indians	Rising Pune Supergiant	field
2	Gujarat Lions	Kolkata Knight Riders	field
3	Rising Pune Supergiant	Kings XI Punjab	field
4	Royal Challengers Bangalore	Delhi Daredevils	bat
..
631	Delhi Daredevils	Royal Challengers Bangalore	field
632	Gujarat Lions	Royal Challengers Bangalore	field
633	Sunrisers Hyderabad	Kolkata Knight Riders	field
634	Gujarat Lions	Sunrisers Hyderabad	field
635	Sunrisers Hyderabad	Royal Challengers Bangalore	bat

[636 rows x 3 columns]

```
[22]: mask=data['city']=='Hyderabad'
```

```
[23]: type(mask)
```

```
[23]: pandas.core.series.Series
```

```
[24]: data[mask].shape
```

```
[24]: (49, 18)
```

```
[25]: def get_city_match_count(city):
      mask = data['city']==city
      return data[mask].shape[0]
```

```
[26]: get_city_match_count('Mumbai')
```

```
[26]: 85
```

```
[27]: mask1 = data['city']>='Ayderabad'
      mask2 = data['date']>'2012-01-01'
```

```
[28]: data[mask2].shape
```

```
[28]: (388, 18)
```

```
[29]: data[mask1].shape
```

```
[29]: (610, 18)
```

```
[30]: data[mask1&mask2].shape
```

```
[30]: (366, 18)
```

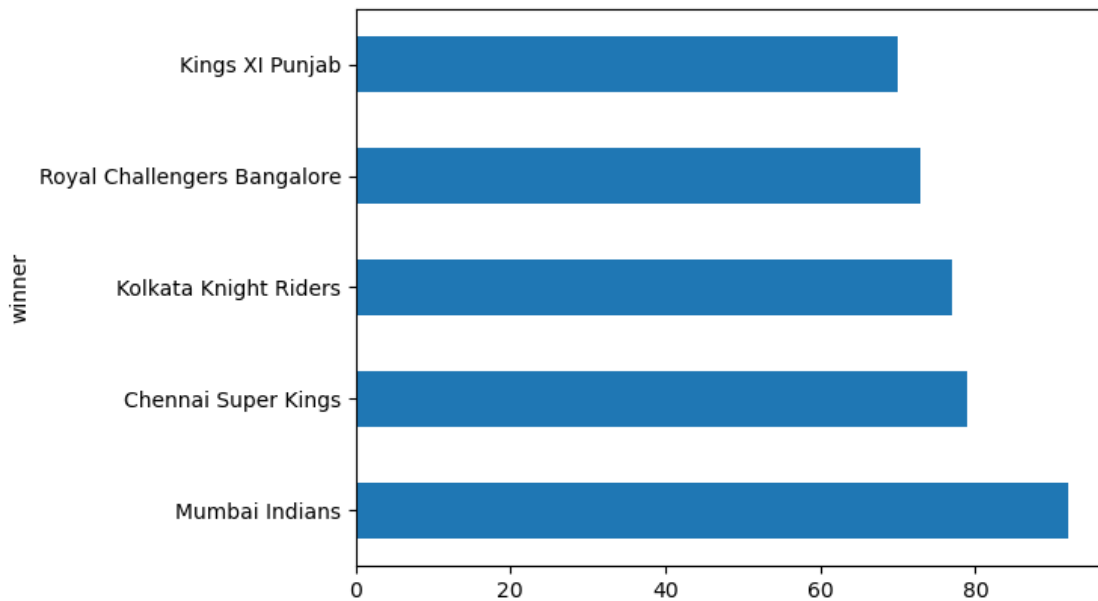
```
[31]: data['winner'].value_counts()
```

```
[31]: winner
      Mumbai Indians          92
      Chennai Super Kings      79
      Kolkata Knight Riders     77
      Royal Challengers Bangalore 73
      Kings XI Punjab          70
      Rajasthan Royals         63
      Delhi Daredevils         62
      Sunrisers Hyderabad      42
      Deccan Chargers          29
      Gujarat Lions            13
      Pune Warriors            12
      Rising Pune Supergiant    10
      Kochi Tuskers Kerala      6
      Rising Pune Supergiants   5
      Name: count, dtype: int64
```

```
[32]: import matplotlib.pyplot as plt
```

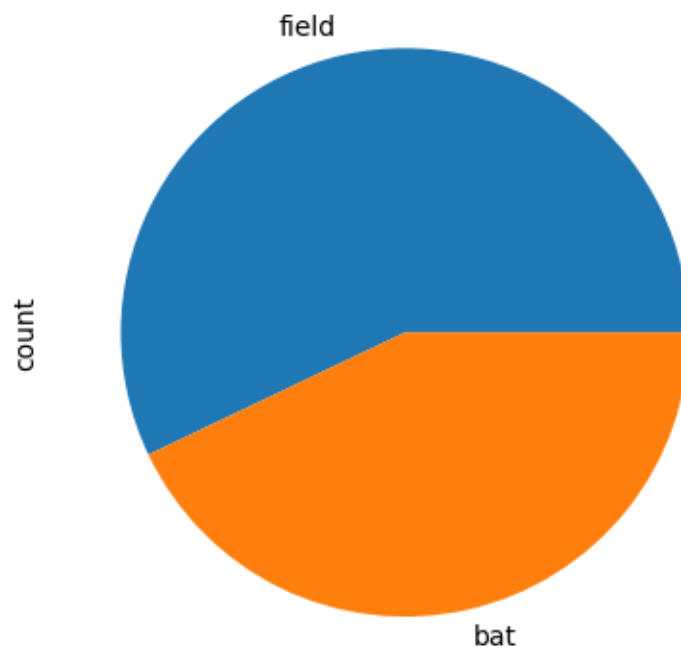
```
[33]: data['winner'].value_counts().head().plot(kind='barh')
```

```
[33]: <Axes: ylabel='winner'>
```



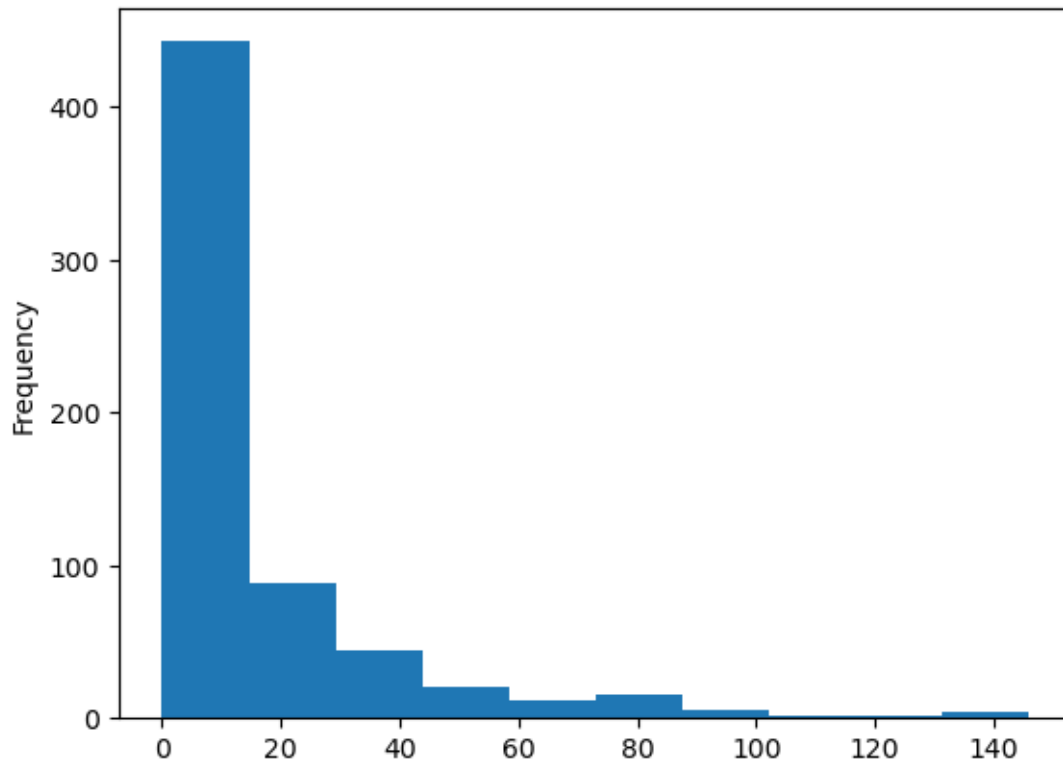
```
[34]: data['toss_decision'].value_counts().plot(kind='pie')
```

```
[34]: <Axes: ylabel='count'>
```



```
[35]: data['win_by_runs'].plot(kind="hist")
```

```
[35]: <Axes: ylabel='Frequency'>
```



```
[36]: myseries=data['winner'].value_counts()
```

```
[37]: myseries.index
```

```
[37]: Index(['Mumbai Indians', 'Chennai Super Kings', 'Kolkata Knight Riders',
            'Royal Challengers Bangalore', 'Kings XI Punjab', 'Rajasthan Royals',
            'Delhi Daredevils', 'Sunrisers Hyderabad', 'Deccan Chargers',
            'Gujarat Lions', 'Pune Warriors', 'Rising Pune Supergiant',
            'Kochi Tuskers Kerala', 'Rising Pune Supergiants'],
            dtype='object', name='winner')
```

```
[38]: myseries.values
```

```
[38]: array([92, 79, 77, 73, 70, 63, 62, 42, 29, 13, 12, 10,  6,  5],
            dtype=int64)
```

```
[39]: myseries.head
```

```
[39]: <bound method NDFrame.head of winner>
Mumbai Indians          92
Chennai Super Kings     79
Kolkata Knight Riders    77
```

```

Royal Challengers Bangalore    73
Kings XI Punjab                70
Rajasthan Royals               63
Delhi Daredevils               62
Sunrisers Hyderabad           42
Deccan Chargers                29
Gujarat Lions                  13
Pune Warriors                  12
Rising Pune Supergiant         10
Kochi Tuskers Kerala           6
Rising Pune Supergiants        5
Name: count, dtype: int64>

```

```
[40]: myseries['Kings XI Punjab']
```

```
[40]: 70
```

```
[41]: (data['team1'].value_counts()+data['team2'].value_counts()).
      ↪sort_values(ascending=False)
```

```

[41]: Mumbai Indians            157
      Royal Challengers Bangalore 152
      Kings XI Punjab            148
      Kolkata Knight Riders       148
      Delhi Daredevils            147
      Chennai Super Kings         131
      Rajasthan Royals            118
      Sunrisers Hyderabad         76
      Deccan Chargers             75
      Pune Warriors               46
      Gujarat Lions               30
      Rising Pune Supergiant       16
      Kochi Tuskers Kerala         14
      Rising Pune Supergiants      14
      Name: count, dtype: int64

```

```
[42]: data
```

```

[42]:   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
..   ...   ...   ...   ...   ...
631  632   2016   Raipur 2016-05-22    Delhi Daredevils
632  633   2016  Bangalore 2016-05-24    Gujarat Lions

```

633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

		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	
..	
631	Royal Challengers Bangalore	Royal Challengers Bangalore		field	
632	Royal Challengers Bangalore	Royal Challengers Bangalore		field	
633	Kolkata Knight Riders	Kolkata Knight Riders		field	
634	Sunrisers Hyderabad	Sunrisers Hyderabad		field	
635	Royal Challengers Bangalore	Sunrisers Hyderabad		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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	

3		Holkar Cricket Stadium	AK Chaudhary
4		M Chinnaswamy Stadium	NaN
..	
631	Shaheed Veer Narayan Singh International Stadium		A Nand Kishore
632		M Chinnaswamy Stadium	AK Chaudhary
633		Feroz Shah Kotla	M Erasmus
634		Feroz Shah Kotla	M Erasmus
635		M Chinnaswamy Stadium	HDPK Dharmasena

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN
634	CK Nandan	NaN
635	BNJ Oxenford	NaN

[636 rows x 18 columns]

```
[43]: data.sort_values('city')
```

```
[43]:
```

	id	season	city	date	team1 \
460	461	2014	Abu Dhabi	2014-04-18	Sunrisers Hyderabad
471	472	2014	Abu Dhabi	2014-04-26	Kings XI Punjab
470	471	2014	Abu Dhabi	2014-04-26	Royal Challengers Bangalore
464	465	2014	Abu Dhabi	2014-04-21	Chennai Super Kings
459	460	2014	Abu Dhabi	2014-04-18	Chennai Super Kings
..
466	467	2014	NaN	2014-04-23	Chennai Super Kings
468	469	2014	NaN	2014-04-25	Sunrisers Hyderabad
469	470	2014	NaN	2014-04-25	Mumbai Indians
474	475	2014	NaN	2014-04-28	Royal Challengers Bangalore
476	477	2014	NaN	2014-04-30	Sunrisers Hyderabad

	team2	toss_winner	toss_decision	result \
460	Rajasthan Royals	Rajasthan Royals	field	normal
471	Kolkata Knight Riders	Kolkata Knight Riders	field	normal
470	Rajasthan Royals	Rajasthan Royals	field	normal
464	Delhi Daredevils	Chennai Super Kings	bat	normal
459	Kings XI Punjab	Chennai Super Kings	bat	normal
..
466	Rajasthan Royals	Rajasthan Royals	field	normal

468	Delhi Daredevils	Sunrisers Hyderabad	bat	normal
469	Chennai Super Kings	Mumbai Indians	bat	normal
474	Kings XI Punjab	Kings XI Punjab	field	normal
476	Mumbai Indians	Mumbai Indians	field	normal

	dl_applied	winner	win_by_runs	win_by_wickets	\
460	0	Rajasthan Royals	0	4	
471	0	Kings XI Punjab	23	0	
470	0	Rajasthan Royals	0	6	
464	0	Chennai Super Kings	93	0	
459	0	Kings XI Punjab	0	6	
..	
466	0	Chennai Super Kings	7	0	
468	0	Sunrisers Hyderabad	4	0	
469	0	Chennai Super Kings	0	7	
474	0	Kings XI Punjab	0	5	
476	0	Sunrisers Hyderabad	15	0	

	player_of_match	venue	umpire1	\
460	AM Rahane	Sheikh Zayed Stadium	BF Bowden	
471	Sandeep Sharma	Sheikh Zayed Stadium	HDPK Dharmasena	
470	PV Tambe	Sheikh Zayed Stadium	HDPK Dharmasena	
464	SK Raina	Sheikh Zayed Stadium	RK Illingworth	
459	GJ Maxwell	Sheikh Zayed Stadium	RK Illingworth	
..	
466	RA Jadeja	Dubai International Cricket Stadium	HDPK Dharmasena	
468	AJ Finch	Dubai International Cricket Stadium	M Erasmus	
469	MM Sharma	Dubai International Cricket Stadium	BF Bowden	
474	Sandeep Sharma	Dubai International Cricket Stadium	BF Bowden	
476	B Kumar	Dubai International Cricket Stadium	HDPK Dharmasena	

	umpire2	umpire3
460	RK Illingworth	NaN
471	RK Illingworth	NaN
470	C Shamshuddin	NaN
464	C Shamshuddin	NaN
459	C Shamshuddin	NaN
..
466	RK Illingworth	NaN
468	S Ravi	NaN
469	M Erasmus	NaN
474	S Ravi	NaN
476	M Erasmus	NaN

[636 rows x 18 columns]

```
[44]: data.sort_values('city',ascending=False)
```

```

[44]:      id  season      city      date      team1 \
312  313    2012  Visakhapatnam  2012-04-07    Chennai Super Kings
622  623    2016  Visakhapatnam  2016-05-15          Mumbai Indians
615  616    2016  Visakhapatnam  2016-05-10    Sunrisers Hyderabad
612  613    2016  Visakhapatnam  2016-05-08    Sunrisers Hyderabad
624  625    2016  Visakhapatnam  2016-05-17      Delhi Daredevils
..    ..    ..
466  467    2014      NaN  2014-04-23    Chennai Super Kings
468  469    2014      NaN  2014-04-25    Sunrisers Hyderabad
469  470    2014      NaN  2014-04-25          Mumbai Indians
474  475    2014      NaN  2014-04-28  Royal Challengers Bangalore
476  477    2014      NaN  2014-04-30    Sunrisers Hyderabad

      team2      toss_winner  toss_decision  result \
312      Deccan Chargers      Deccan Chargers      field  normal
622      Delhi Daredevils      Delhi Daredevils      field  normal
615  Rising Pune Supergiants      Sunrisers Hyderabad      bat  normal
612      Mumbai Indians      Mumbai Indians      field  normal
624  Rising Pune Supergiants  Rising Pune Supergiants      field  normal
..    ..
466      Rajasthan Royals      Rajasthan Royals      field  normal
468      Delhi Daredevils      Sunrisers Hyderabad      bat  normal
469      Chennai Super Kings      Mumbai Indians      bat  normal
474      Kings XI Punjab      Kings XI Punjab      field  normal
476      Mumbai Indians      Mumbai Indians      field  normal

      dl_applied      winner  win_by_runs  win_by_wickets \
312      0      Chennai Super Kings      74      0
622      0      Mumbai Indians      80      0
615      0      Sunrisers Hyderabad      4      0
612      0      Sunrisers Hyderabad      85      0
624      1  Rising Pune Supergiants      19      0
..    ..
466      0      Chennai Super Kings      7      0
468      0      Sunrisers Hyderabad      4      0
469      0      Chennai Super Kings      0      7
474      0      Kings XI Punjab      0      5
476      0      Sunrisers Hyderabad      15      0

      player_of_match      venue \
312      RA Jadeja  Dr. Y.S. Rajasekhara Reddy  ACA-VDCA Cricket St...
622      KH Pandya  Dr. Y.S. Rajasekhara Reddy  ACA-VDCA Cricket St...
615      A Zampa  Dr. Y.S. Rajasekhara Reddy  ACA-VDCA Cricket St...
612      A Nehra  Dr. Y.S. Rajasekhara Reddy  ACA-VDCA Cricket St...
624      AB Dinda  Dr. Y.S. Rajasekhara Reddy  ACA-VDCA Cricket St...
..    ..
466      RA Jadeja      Dubai International Cricket Stadium

```

468	AJ Finch	Dubai International Cricket Stadium
469	MM Sharma	Dubai International Cricket Stadium
474	Sandeep Sharma	Dubai International Cricket Stadium
476	B Kumar	Dubai International Cricket Stadium

	umpire1	umpire2	umpire3
312	JD Cloete	HDPK Dharmasena	NaN
622	Nitin Menon	CK Nandan	NaN
615	CB Gaffaney	VK Sharma	NaN
612	S Ravi	C Shamshuddin	NaN
624	Nitin Menon	C Shamshuddin	NaN
..
466	HDPK Dharmasena	RK Illingworth	NaN
468	M Erasmus	S Ravi	NaN
469	BF Bowden	M Erasmus	NaN
474	BF Bowden	S Ravi	NaN
476	HDPK Dharmasena	M Erasmus	NaN

[636 rows x 18 columns]

```
[45]: data = pd.read_csv('matches - matches.csv')
```

```
[46]: data.sort_values(['city','date'],ascending=[True,False])
```

```
[46]:
```

	id	season	city	date	team1 \
475	476	2014	Abu Dhabi	2014-04-29	Rajasthan Royals
470	471	2014	Abu Dhabi	2014-04-26	Royal Challengers Bangalore
471	472	2014	Abu Dhabi	2014-04-26	Kings XI Punjab
464	465	2014	Abu Dhabi	2014-04-21	Chennai Super Kings
459	460	2014	Abu Dhabi	2014-04-18	Chennai Super Kings
..
468	469	2014	NaN	2014-04-25	Sunrisers Hyderabad
469	470	2014	NaN	2014-04-25	Mumbai Indians
466	467	2014	NaN	2014-04-23	Chennai Super Kings
461	462	2014	NaN	2014-04-19	Mumbai Indians
462	463	2014	NaN	2014-04-19	Kolkata Knight Riders

	team2	toss_winner	toss_decision \
475	Kolkata Knight Riders	Rajasthan Royals	bat
470	Rajasthan Royals	Rajasthan Royals	field
471	Kolkata Knight Riders	Kolkata Knight Riders	field
464	Delhi Daredevils	Chennai Super Kings	bat
459	Kings XI Punjab	Chennai Super Kings	bat
..
468	Delhi Daredevils	Sunrisers Hyderabad	bat
469	Chennai Super Kings	Mumbai Indians	bat
466	Rajasthan Royals	Rajasthan Royals	field

461	Royal Challengers Bangalore	Royal Challengers Bangalore	field
462	Delhi Daredevils	Kolkata Knight Riders	bat

	result	dl_applied	winner	win_by_runs	\
475	tie	0	Rajasthan Royals	0	
470	normal	0	Rajasthan Royals	0	
471	normal	0	Kings XI Punjab	23	
464	normal	0	Chennai Super Kings	93	
459	normal	0	Kings XI Punjab	0	
..	
468	normal	0	Sunrisers Hyderabad	4	
469	normal	0	Chennai Super Kings	0	
466	normal	0	Chennai Super Kings	7	
461	normal	0	Royal Challengers Bangalore	0	
462	normal	0	Delhi Daredevils	0	

	win_by_wickets	player_of_match	venue	\
475	0	JP Faulkner	Sheikh Zayed Stadium	
470	6	PV Tambe	Sheikh Zayed Stadium	
471	0	Sandeep Sharma	Sheikh Zayed Stadium	
464	0	SK Raina	Sheikh Zayed Stadium	
459	6	GJ Maxwell	Sheikh Zayed Stadium	
..	
468	0	AJ Finch	Dubai International Cricket Stadium	
469	7	MM Sharma	Dubai International Cricket Stadium	
466	0	RA Jadeja	Dubai International Cricket Stadium	
461	7	PA Patel	Dubai International Cricket Stadium	
462	4	JP Duminy	Dubai International Cricket Stadium	

	umpire1	umpire2	umpire3
475	Aleem Dar	AK Chaudhary	NaN
470	HDPK Dharmasena	C Shamshuddin	NaN
471	HDPK Dharmasena	RK Illingworth	NaN
464	RK Illingworth	C Shamshuddin	NaN
459	RK Illingworth	C Shamshuddin	NaN
..
468	M Erasmus	S Ravi	NaN
469	BF Bowden	M Erasmus	NaN
466	HDPK Dharmasena	RK Illingworth	NaN
461	Aleem Dar	AK Chaudhary	NaN
462	Aleem Dar	VA Kulkarni	NaN

[636 rows x 18 columns]

[47]: data

```

[47]:      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
..    ..    ..      ..      ..      ..
631  632    2016    Raipur  2016-05-22      Delhi Daredevils
632  633    2016  Bangalore  2016-05-24      Gujarat Lions
633  634    2016      Delhi  2016-05-25      Sunrisers Hyderabad
634  635    2016      Delhi  2016-05-27      Gujarat Lions
635  636    2016  Bangalore  2016-05-29      Sunrisers Hyderabad

      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
..    ..      ..      ..      ..
631  Royal Challengers Bangalore  Royal Challengers Bangalore      field
632  Royal Challengers Bangalore  Royal Challengers Bangalore      field
633      Kolkata Knight Riders      Kolkata Knight Riders      field
634      Sunrisers Hyderabad      Sunrisers Hyderabad      field
635  Royal Challengers Bangalore      Sunrisers Hyderabad      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
..    ..      ..      ..      ..
631  normal      0  Royal Challengers Bangalore      0
632  normal      0  Royal Challengers Bangalore      0
633  normal      0      Sunrisers Hyderabad      22
634  normal      0      Sunrisers Hyderabad      0
635  normal      0      Sunrisers Hyderabad      8

      win_by_wickets player_of_match \
0      0      Yuvraj Singh
1      7      SPD Smith
2     10      CA Lynn
3      6      GJ Maxwell
4      0      KM Jadhav
..    ..      ..
631      6      V Kohli

```

```

632          4 AB de Villiers
633          0 MC Henriques
634          4 DA Warner
635          0 BCJ Cutting

```

```

                                venue      umpire1 \
0      Rajiv Gandhi International Stadium, Uppal      AY Dandekar
1      Maharashtra Cricket Association Stadium      A Nand Kishore
2      Saurashtra Cricket Association Stadium      Nitin Menon
3      Holkar Cricket Stadium      AK Chaudhary
4      M Chinnaswamy Stadium      NaN
..      ...
631 Shaheed Veer Narayan Singh International Stadium      A Nand Kishore
632      M Chinnaswamy Stadium      AK Chaudhary
633      Feroz Shah Kotla      M Erasmus
634      Feroz Shah Kotla      M Erasmus
635      M Chinnaswamy Stadium      HDPK Dharmasena

```

```

                umpire2  umpire3
0      NJ Llong      NaN
1      S Ravi      NaN
2      CK Nandan      NaN
3      C Shamshuddin      NaN
4      NaN      NaN
..      ...
631      BNJ Oxenford      NaN
632      HDPK Dharmasena      NaN
633      C Shamshuddin      NaN
634      CK Nandan      NaN
635      BNJ Oxenford      NaN

```

[636 rows x 18 columns]

```
[48]: data.drop_duplicates(subset=['city','season']).shape
```

```
[48]: (107, 18)
```

```
[49]: data.drop_duplicates('season')
```

```

[49]:      id  season      city      date      team1 \
0      1    2017  Hyderabad  2017-04-05  Sunrisers Hyderabad
59     60    2008  Bangalore  2008-04-18  Kolkata Knight Riders
117   118    2009  Cape Town  2009-04-18      Mumbai Indians
174   175    2010    Mumbai  2010-03-12  Kolkata Knight Riders
234   235    2011    Chennai  2011-04-08    Chennai Super Kings
307   308    2012    Chennai  2012-04-04    Chennai Super Kings
381   382    2013    Kolkata  2013-04-03    Delhi Daredevils

```

457	458	2014	Abu Dhabi	2014-04-16	Kolkata Knight Riders
517	518	2015	Kolkata	2015-04-08	Mumbai Indians
576	577	2016	Mumbai	2016-04-09	Mumbai Indians

	team2	toss_winner	toss_decision	\
0	Royal Challengers Bangalore	Royal Challengers Bangalore	field	
59	Royal Challengers Bangalore	Royal Challengers Bangalore	field	
117	Chennai Super Kings	Chennai Super Kings	field	
174	Deccan Chargers	Deccan Chargers	field	
234	Kolkata Knight Riders	Chennai Super Kings	bat	
307	Mumbai Indians	Mumbai Indians	field	
381	Kolkata Knight Riders	Kolkata Knight Riders	field	
457	Mumbai Indians	Kolkata Knight Riders	bat	
517	Kolkata Knight Riders	Kolkata Knight Riders	field	
576	Rising Pune Supergiants	Mumbai Indians	bat	

	result	dl_applied	winner	win_by_runs	win_by_wickets	\
0	normal	0	Sunrisers Hyderabad	35	0	
59	normal	0	Kolkata Knight Riders	140	0	
117	normal	0	Mumbai Indians	19	0	
174	normal	0	Kolkata Knight Riders	11	0	
234	normal	0	Chennai Super Kings	2	0	
307	normal	0	Mumbai Indians	0	8	
381	normal	0	Kolkata Knight Riders	0	6	
457	normal	0	Kolkata Knight Riders	41	0	
517	normal	0	Kolkata Knight Riders	0	7	
576	normal	0	Rising Pune Supergiants	0	9	

	player_of_match	venue	\
0	Yuvraj Singh	Rajiv Gandhi International Stadium, Uppal	
59	BB McCullum	M Chinnaswamy Stadium	
117	SR Tendulkar	Newlands	
174	AD Mathews	Dr DY Patil Sports Academy	
234	S Anirudha	MA Chidambaram Stadium, Chepauk	
307	RE Levi	MA Chidambaram Stadium, Chepauk	
381	SP Narine	Eden Gardens	
457	JH Kallis	Sheikh Zayed Stadium	
517	M Morkel	Eden Gardens	
576	AM Rahane	Wankhede Stadium	

	umpire1	umpire2	umpire3
0	AY Dandekar	NJ Llong	NaN
59	Asad Rauf	RE Koertzen	NaN
117	BR Doctrove	K Hariharan	NaN
174	RE Koertzen	RB Tiffin	NaN
234	BR Doctrove	PR Reiffel	NaN
307	JD Cloete	SJA Taufel	NaN

```

381          S Ravi          SJA Taufel          NaN
457          M Erasmus      RK Illingworth        NaN
517          S Ravi          C Shamshuddin        NaN
576  HDPK Dharmasena          CK Nandan          NaN

```

```
[50]: mas=data.drop_duplicates('season',keep='last')
```

```
[51]: mas[['season','winner']].sort_values('season')
```

```

[51]:      season          winner
116    2008    Rajasthan Royals
173    2009      Deccan Chargers
233    2010    Chennai Super Kings
306    2011    Chennai Super Kings
380    2012  Kolkata Knight Riders
456    2013      Mumbai Indians
516    2014  Kolkata Knight Riders
575    2015      Mumbai Indians
635    2016    Sunrisers Hyderabad
58     2017      Mumbai Indians

```

```
[52]: data
```

```

[52]:      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
..    ...    ...    ...    ...    ...
631  632    2016    Raipur  2016-05-22    Delhi Daredevils
632  633    2016  Bangalore  2016-05-24      Gujarat Lions
633  634    2016      Delhi  2016-05-25    Sunrisers Hyderabad
634  635    2016      Delhi  2016-05-27      Gujarat Lions
635  636    2016  Bangalore  2016-05-29    Sunrisers Hyderabad

      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
..    ...    ...    ...
631  Royal Challengers Bangalore  Royal Challengers Bangalore    field
632  Royal Challengers Bangalore  Royal Challengers Bangalore    field
633      Kolkata Knight Riders      Kolkata Knight Riders    field
634      Sunrisers Hyderabad      Sunrisers Hyderabad    field

```


635 Royal Challengers Bangalore Sunrisers Hyderabad 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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN

```

..      ...      ...
631      BNJ Oxenford      NaN
632      HDPK Dharmasena      NaN
633      C Shamshuddin      NaN
634      CK Nandan      NaN
635      BNJ Oxenford      NaN

```

[636 rows x 18 columns]

```
[53]: a=data.groupby('venue')
```

```
[54]: len(a)
```

```
[54]: 35
```

```
[55]: a.size().sort_values()
```

```

[55]: venue
OUTsurance Oval                2
Buffalo Park                   3
De Beers Diamond Oval          3
Vidarbha Cricket Association Stadium, Jamtha  3
Green Park                     4
Nehru Stadium                  5
Holkar Cricket Stadium          5
Sharjah Cricket Stadium         6
Shaheed Veer Narayan Singh International Stadium  6
St George's Park               7
Sheikh Zayed Stadium            7
Newlands                       7
Barabati Stadium               7
Dubai International Cricket Stadium  7
JSCA International Stadium Complex  7
New Wanderers Stadium          8
Himachal Pradesh Cricket Association Stadium  9
Saurashtra Cricket Association Stadium 10
Punjab Cricket Association IS Bindra Stadium, Mohali 11
Brabourne Stadium              11
Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium 11
SuperSport Park                12
Sardar Patel Stadium, Motera    12
Kingsmead                     15
Maharashtra Cricket Association Stadium 15
Subrata Roy Sahara Stadium      17
Dr DY Patil Sports Academy      17
Sawai Mansingh Stadium          33
Punjab Cricket Association Stadium, Mohali 35

```

MA Chidambaram Stadium, Chepauk	48
Rajiv Gandhi International Stadium, Uppal	49
Wankhede Stadium	57
Feroz Shah Kotla	60
Eden Gardens	61
M Chinnaswamy Stadium	66

dtype: int64

```
[56]: mask=data['venue']=='Nehru Stadium'
```

```
[57]: data[mask]
```

```
[57]:
```

	id	season	city	date	team1 \	
236	237	2011	Kochi	2011-04-09	Kochi Tuskers Kerala	
251	252	2011	Kochi	2011-04-18	Chennai Super Kings	
264	265	2011	Kochi	2011-04-27	Deccan Chargers	
268	269	2011	Kochi	2011-04-30	Delhi Daredevils	
277	278	2011	Kochi	2011-05-05	Kochi Tuskers Kerala	

		team2	toss_winner	toss_decision	result \
236	Royal Challengers Bangalore	Kochi Tuskers Kerala		bat	normal
251	Kochi Tuskers Kerala	Kochi Tuskers Kerala		field	normal
264	Kochi Tuskers Kerala	Kochi Tuskers Kerala		field	normal
268	Kochi Tuskers Kerala	Delhi Daredevils		bat	normal
277	Kolkata Knight Riders	Kolkata Knight Riders		field	normal

	dl_applied		winner	win_by_runs	win_by_wickets \
236	0	Royal Challengers Bangalore		0	6
251	1	Kochi Tuskers Kerala		0	7
264	0	Deccan Chargers		55	0
268	0	Delhi Daredevils		38	0
277	0	Kochi Tuskers Kerala		17	0

	player_of_match	venue	umpire1	umpire2	umpire3
236	AB de Villiers	Nehru Stadium	HDPK Dharmasena	K Hariharan	NaN
251	BB McCullum	Nehru Stadium	K Hariharan	AL Hill	NaN
264	I Sharma	Nehru Stadium	HDPK Dharmasena	AL Hill	NaN
268	V Sehwag	Nehru Stadium	HDPK Dharmasena	AL Hill	NaN
277	BJ Hodge	Nehru Stadium	S Ravi	RJ Tucker	NaN

```
[58]: a.groups
```

```
[58]: {'Barabati Stadium': [185, 188, 336, 347, 485, 490, 496], 'Brabourne Stadium': [175, 187, 190, 193, 200, 206, 220, 514, 552, 557, 569], 'Buffalo Park': [137, 143, 149], 'De Beers Diamond Oval': [150, 151, 154], 'Dr DY Patil Sports Academy': [71, 81, 85, 116, 174, 198, 230, 231, 232, 233, 238, 243, 249, 263, 276, 294, 297], 'Dr. Y.S. Rajasekhara Reddy ACA-VDCA Cricket Stadium': [312,
```

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478, 483, 489, 507, 512, 515, 523, 529, 540, 548, 555, 561, 566, 572, 576, 584, 589, 599]}}

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[59]: a.get_group('Wankhede Stadium').mean
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```
[59]: <bound method DataFrame.mean of      id  season  city      date
team1 \
6      7      2017  Mumbai  2017-04-09      Kolkata Knight Riders
9     10      2017  Mumbai  2017-04-12      Sunrisers Hyderabad
15    16      2017  Mumbai  2017-04-16      Gujarat Lions
23    24      2017  Mumbai  2017-04-22      Mumbai Indians
27    28      2017  Mumbai  2017-04-24      Rising Pune Supergiant
36    37      2017  Mumbai  2017-05-01  Royal Challengers Bangalore
49    50      2017  Mumbai  2017-05-11      Kings XI Punjab
55    56      2017  Mumbai  2017-05-16      Rising Pune Supergiant
62    63      2008  Mumbai  2008-04-20      Mumbai Indians
95    96      2008  Mumbai  2008-05-14      Chennai Super Kings
98    99      2008  Mumbai  2008-05-16      Kolkata Knight Riders
105  106      2008  Mumbai  2008-05-21      Kings XI Punjab
114  115      2008  Mumbai  2008-05-30      Rajasthan Royals
115  116      2008  Mumbai  2008-05-31      Kings XI Punjab
246  247      2011  Mumbai  2011-04-15      Mumbai Indians
253  254      2011  Mumbai  2011-04-20      Pune Warriors
256  257      2011  Mumbai  2011-04-22      Mumbai Indians
272  273      2011  Mumbai  2011-05-02      Mumbai Indians
281  282      2011  Mumbai  2011-05-07      Mumbai Indians
291  292      2011  Mumbai  2011-05-14      Deccan Chargers
298  299      2011  Mumbai  2011-05-20      Mumbai Indians
303  304      2011  Mumbai  2011-05-24  Royal Challengers Bangalore
304  305      2011  Mumbai  2011-05-25      Kolkata Knight Riders
309  310      2012  Mumbai  2012-04-06      Pune Warriors
318  319      2012  Mumbai  2012-04-11      Mumbai Indians
326  327      2012  Mumbai  2012-04-16      Mumbai Indians
335  336      2012  Mumbai  2012-04-22      Mumbai Indians
345  346      2012  Mumbai  2012-04-29      Deccan Chargers
354  355      2012  Mumbai  2012-05-06      Chennai Super Kings
359  360      2012  Mumbai  2012-05-09      Mumbai Indians
369  370      2012  Mumbai  2012-05-16      Kolkata Knight Riders
389  390      2013  Mumbai  2013-04-09      Mumbai Indians
394  395      2013  Mumbai  2013-04-13      Mumbai Indians
416  417      2013  Mumbai  2013-04-27      Mumbai Indians
420  421      2013  Mumbai  2013-04-29      Mumbai Indians
429  430      2013  Mumbai  2013-05-05      Mumbai Indians
433  434      2013  Mumbai  2013-05-07      Mumbai Indians
443  444      2013  Mumbai  2013-05-13      Sunrisers Hyderabad
446  447      2013  Mumbai  2013-05-15      Mumbai Indians
478  479      2014  Mumbai  2014-05-03      Kings XI Punjab
```

483	484	2014	Mumbai	2014-05-06	Mumbai Indians
489	490	2014	Mumbai	2014-05-10	Mumbai Indians
507	508	2014	Mumbai	2014-05-23	Mumbai Indians
512	513	2014	Mumbai	2014-05-25	Rajasthan Royals
515	516	2014	Mumbai	2014-05-30	Kings XI Punjab
523	524	2015	Mumbai	2015-04-12	Kings XI Punjab
529	530	2015	Mumbai	2015-04-17	Mumbai Indians
540	541	2015	Mumbai	2015-04-25	Mumbai Indians
548	549	2015	Mumbai	2015-05-01	Mumbai Indians
555	556	2015	Mumbai	2015-05-05	Delhi Daredevils
561	562	2015	Mumbai	2015-05-10	Royal Challengers Bangalore
566	567	2015	Mumbai	2015-05-14	Mumbai Indians
572	573	2015	Mumbai	2015-05-19	Mumbai Indians
576	577	2016	Mumbai	2016-04-09	Mumbai Indians
584	585	2016	Mumbai	2016-04-16	Mumbai Indians
589	590	2016	Mumbai	2016-04-20	Royal Challengers Bangalore
599	600	2016	Mumbai	2016-04-28	Kolkata Knight Riders

	team2	toss_winner	toss_decision \
6	Mumbai Indians	Mumbai Indians	field
9	Mumbai Indians	Mumbai Indians	field
15	Mumbai Indians	Mumbai Indians	field
23	Delhi Daredevils	Delhi Daredevils	field
27	Mumbai Indians	Mumbai Indians	field
36	Mumbai Indians	Royal Challengers Bangalore	bat
49	Mumbai Indians	Mumbai Indians	field
55	Mumbai Indians	Mumbai Indians	field
62	Royal Challengers Bangalore	Mumbai Indians	bat
95	Mumbai Indians	Mumbai Indians	field
98	Mumbai Indians	Mumbai Indians	field
105	Mumbai Indians	Mumbai Indians	field
114	Delhi Daredevils	Delhi Daredevils	field
115	Chennai Super Kings	Kings XI Punjab	bat
246	Kochi Tuskers Kerala	Kochi Tuskers Kerala	field
253	Mumbai Indians	Pune Warriors	bat
256	Chennai Super Kings	Chennai Super Kings	field
272	Kings XI Punjab	Kings XI Punjab	field
281	Delhi Daredevils	Delhi Daredevils	field
291	Mumbai Indians	Deccan Chargers	bat
298	Rajasthan Royals	Mumbai Indians	bat
303	Chennai Super Kings	Chennai Super Kings	field
304	Mumbai Indians	Mumbai Indians	field
309	Mumbai Indians	Mumbai Indians	field
318	Rajasthan Royals	Rajasthan Royals	field
326	Delhi Daredevils	Delhi Daredevils	field
335	Kings XI Punjab	Mumbai Indians	bat
345	Mumbai Indians	Mumbai Indians	field

354	Mumbai Indians	Mumbai Indians	field
359	Royal Challengers Bangalore	Royal Challengers Bangalore	field
369	Mumbai Indians	Mumbai Indians	field
389	Delhi Daredevils	Mumbai Indians	bat
394	Pune Warriors	Mumbai Indians	bat
416	Royal Challengers Bangalore	Mumbai Indians	bat
420	Kings XI Punjab	Mumbai Indians	bat
429	Chennai Super Kings	Mumbai Indians	bat
433	Kolkata Knight Riders	Mumbai Indians	bat
443	Mumbai Indians	Sunrisers Hyderabad	bat
446	Rajasthan Royals	Rajasthan Royals	field
478	Mumbai Indians	Kings XI Punjab	bat
483	Royal Challengers Bangalore	Royal Challengers Bangalore	field
489	Chennai Super Kings	Chennai Super Kings	field
507	Delhi Daredevils	Delhi Daredevils	field
512	Mumbai Indians	Mumbai Indians	field
515	Chennai Super Kings	Chennai Super Kings	field
523	Mumbai Indians	Mumbai Indians	field
529	Chennai Super Kings	Mumbai Indians	bat
540	Sunrisers Hyderabad	Mumbai Indians	bat
548	Rajasthan Royals	Rajasthan Royals	field
555	Mumbai Indians	Delhi Daredevils	bat
561	Mumbai Indians	Royal Challengers Bangalore	bat
566	Kolkata Knight Riders	Kolkata Knight Riders	field
572	Chennai Super Kings	Mumbai Indians	bat
576	Rising Pune Supergiants	Mumbai Indians	bat
584	Gujarat Lions	Gujarat Lions	field
589	Mumbai Indians	Mumbai Indians	field
599	Mumbai Indians	Mumbai Indians	field

	result	dl_applied	winner	win_by_runs	\
6	normal	0	Mumbai Indians	0	
9	normal	0	Mumbai Indians	0	
15	normal	0	Mumbai Indians	0	
23	normal	0	Mumbai Indians	14	
27	normal	0	Rising Pune Supergiant	3	
36	normal	0	Mumbai Indians	0	
49	normal	0	Kings XI Punjab	7	
55	normal	0	Rising Pune Supergiant	20	
62	normal	0	Royal Challengers Bangalore	0	
95	normal	0	Mumbai Indians	0	
98	normal	0	Mumbai Indians	0	
105	normal	0	Kings XI Punjab	1	
114	normal	0	Rajasthan Royals	105	
115	normal	0	Chennai Super Kings	0	
246	normal	0	Kochi Tuskers Kerala	0	
253	normal	0	Mumbai Indians	0	

256	normal	0	Mumbai Indians	8
272	normal	0	Mumbai Indians	23
281	normal	0	Mumbai Indians	32
291	normal	0	Deccan Chargers	10
298	normal	0	Rajasthan Royals	0
303	normal	0	Chennai Super Kings	0
304	normal	0	Mumbai Indians	0
309	normal	0	Pune Warriors	28
318	normal	0	Mumbai Indians	27
326	normal	0	Delhi Daredevils	0
335	normal	0	Kings XI Punjab	0
345	normal	0	Mumbai Indians	0
354	normal	0	Mumbai Indians	0
359	normal	0	Royal Challengers Bangalore	0
369	normal	0	Kolkata Knight Riders	32
389	normal	0	Mumbai Indians	44
394	normal	0	Mumbai Indians	41
416	normal	0	Mumbai Indians	58
420	normal	0	Mumbai Indians	4
429	normal	0	Mumbai Indians	60
433	normal	0	Mumbai Indians	65
443	normal	0	Mumbai Indians	0
446	normal	0	Mumbai Indians	14
478	normal	0	Mumbai Indians	0
483	normal	0	Mumbai Indians	19
489	normal	0	Chennai Super Kings	0
507	normal	0	Mumbai Indians	15
512	normal	0	Mumbai Indians	0
515	normal	0	Kings XI Punjab	24
523	normal	0	Kings XI Punjab	18
529	normal	0	Chennai Super Kings	0
540	normal	0	Mumbai Indians	20
548	normal	0	Mumbai Indians	8
555	normal	0	Mumbai Indians	0
561	normal	0	Royal Challengers Bangalore	39
566	normal	0	Mumbai Indians	5
572	normal	0	Mumbai Indians	25
576	normal	0	Rising Pune Supergiants	0
584	normal	0	Gujarat Lions	0
589	normal	0	Mumbai Indians	0
599	normal	0	Mumbai Indians	0

	win_by_wickets	player_of_match	venue	umpire1 \
6	4	N Rana	Wankhede Stadium	Nitin Menon
9	4	JJ Bumrah	Wankhede Stadium	Nitin Menon
15	6	N Rana	Wankhede Stadium	A Nand Kishore
23	0	MJ McClenaghan	Wankhede Stadium	A Nand Kishore

27	0	BA Stokes	Wankhede Stadium	A Nand Kishore
36	5	RG Sharma	Wankhede Stadium	AK Chaudhary
49	0	WP Saha	Wankhede Stadium	A Deshmukh
55	0	Washington Sundar	Wankhede Stadium	S Ravi
62	5	MV Boucher	Wankhede Stadium	SJ Davis
95	9	ST Jayasuriya	Wankhede Stadium	BR Doctrove
98	8	SM Pollock	Wankhede Stadium	BR Doctrove
105	0	SE Marsh	Wankhede Stadium	BF Bowden
114	0	SR Watson	Wankhede Stadium	BF Bowden
115	9	M Ntini	Wankhede Stadium	Asad Rauf
246	8	BB McCullum	Wankhede Stadium	BR Doctrove
253	7	MM Patel	Wankhede Stadium	Asad Rauf
256	0	Harbhajan Singh	Wankhede Stadium	Asad Rauf
272	0	KA Pollard	Wankhede Stadium	HDPK Dharmasena
281	0	AT Rayudu	Wankhede Stadium	K Hariharan
291	0	A Mishra	Wankhede Stadium	S Ravi
298	10	SR Watson	Wankhede Stadium	RE Koertzen
303	6	SK Raina	Wankhede Stadium	Asad Rauf
304	4	MM Patel	Wankhede Stadium	Asad Rauf
309	0	SPD Smith	Wankhede Stadium	AK Chaudhary
318	0	KA Pollard	Wankhede Stadium	Aleem Dar
326	7	S Nadeem	Wankhede Stadium	BF Bowden
335	6	SE Marsh	Wankhede Stadium	S Ravi
345	5	DW Steyn	Wankhede Stadium	AK Chaudhary
354	2	DR Smith	Wankhede Stadium	Asad Rauf
359	9	CH Gayle	Wankhede Stadium	BF Bowden
369	0	SP Narine	Wankhede Stadium	S Das
389	0	KD Karthik	Wankhede Stadium	M Erasmus
394	0	RG Sharma	Wankhede Stadium	S Ravi
416	0	DR Smith	Wankhede Stadium	Asad Rauf
420	0	RG Sharma	Wankhede Stadium	Asad Rauf
429	0	MG Johnson	Wankhede Stadium	HDPK Dharmasena
433	0	SR Tendulkar	Wankhede Stadium	HDPK Dharmasena
443	7	KA Pollard	Wankhede Stadium	AK Chaudhary
446	0	AP Tare	Wankhede Stadium	Asad Rauf
478	5	CJ Anderson	Wankhede Stadium	BNJ Oxenford
483	0	RG Sharma	Wankhede Stadium	S Ravi
489	4	DR Smith	Wankhede Stadium	HDPK Dharmasena
507	0	MEK Hussey	Wankhede Stadium	S Ravi
512	5	CJ Anderson	Wankhede Stadium	K Srinath
515	0	V Sehwag	Wankhede Stadium	HDPK Dharmasena
523	0	GJ Bailey	Wankhede Stadium	AK Chaudhary
529	6	A Nehra	Wankhede Stadium	AK Chaudhary
540	0	SL Malinga	Wankhede Stadium	HDPK Dharmasena
548	0	AT Rayudu	Wankhede Stadium	HDPK Dharmasena
555	5	Harbhajan Singh	Wankhede Stadium	HDPK Dharmasena
561	0	AB de Villiers	Wankhede Stadium	JD Cloete

566	0	HH Pandya	Wankhede Stadium	RK Illingworth
572	0	KA Pollard	Wankhede Stadium	HDPK Dharmasena
576	9	AM Rahane	Wankhede Stadium	HDPK Dharmasena
584	3	AJ Finch	Wankhede Stadium	HDPK Dharmasena
589	6	RG Sharma	Wankhede Stadium	AK Chaudhary
599	6	RG Sharma	Wankhede Stadium	Nitin Menon

	umpire2	umpire3
6	CK Nandan	NaN
9	CK Nandan	NaN
15	S Ravi	NaN
23	S Ravi	NaN
27	S Ravi	NaN
36	CB Gaffaney	NaN
49	A Nand Kishore	NaN
55	C Shamshuddin	NaN
62	DJ Harper	NaN
95	AM Saheba	NaN
98	DJ Harper	NaN
105	GA Pratapkumar	NaN
114	RE Koertzen	NaN
115	DJ Harper	NaN
246	PR Reiffel	NaN
253	AM Saheba	NaN
256	AM Saheba	NaN
272	PR Reiffel	NaN
281	SJA Taufel	NaN
291	SK Tarapore	NaN
298	PR Reiffel	NaN
303	SJA Taufel	NaN
304	SJA Taufel	NaN
309	SJA Taufel	NaN
318	BNJ Oxenford	NaN
326	SK Tarapore	NaN
335	RJ Tucker	NaN
345	BNJ Oxenford	NaN
354	S Asnani	NaN
359	VA Kulkarni	NaN
369	BR Doctrove	NaN
389	VA Kulkarni	NaN
394	SJA Taufel	NaN
416	S Asnani	NaN
420	AK Chaudhary	NaN
429	CK Nandan	NaN
433	S Ravi	NaN
443	SJA Taufel	NaN
446	S Asnani	NaN

478	C Shamshuddin	NaN
483	K Srinath	NaN
489	VA Kulkarni	NaN
507	RJ Tucker	NaN
512	RJ Tucker	NaN
515	RJ Tucker	NaN
523	K Srinivasan	NaN
529	M Erasmus	NaN
540	CB Gaffaney	NaN
548	CK Nandan	NaN
555	CB Gaffaney	NaN
561	C Shamshuddin	NaN
566	VA Kulkarni	NaN
572	RK Illingworth	NaN
576	CK Nandan	NaN
584	VK Sharma	NaN
589	CK Nandan	NaN
599	RJ Tucker	NaN >

[60]: data

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[60]:
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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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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	
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631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN

```

632  HDPK Dharmasena      NaN
633   C Shamshuddin      NaN
634   CK Nandan          NaN
635   BNJ Oxenford       NaN

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[636 rows x 18 columns]

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[142]: deli = pd.read_csv('deliveries.csv')
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```
[146]: deli.head(20)
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```
[146]:
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	match_id	inning	batting_team			bowling_team		over \
0	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
1	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
2	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
3	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
4	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
5	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
6	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				1
7	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
8	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
9	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
10	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
11	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
12	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
13	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				2
14	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3
15	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3
16	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3
17	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3
18	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3
19	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore				3

	ball	batsman		non_striker	bowler	is_super_over	...	\
0	1	DA Warner	S Dhawan		TS Mills	0	...	
1	2	DA Warner	S Dhawan		TS Mills	0	...	
2	3	DA Warner	S Dhawan		TS Mills	0	...	
3	4	DA Warner	S Dhawan		TS Mills	0	...	
4	5	DA Warner	S Dhawan		TS Mills	0	...	
5	6	S Dhawan	DA Warner		TS Mills	0	...	
6	7	S Dhawan	DA Warner		TS Mills	0	...	
7	1	S Dhawan	DA Warner	A Choudhary		0	...	
8	2	DA Warner	S Dhawan	A Choudhary		0	...	
9	3	DA Warner	S Dhawan	A Choudhary		0	...	
10	4	DA Warner	S Dhawan	A Choudhary		0	...	
11	5	DA Warner	S Dhawan	A Choudhary		0	...	
12	6	MC Henriques	S Dhawan	A Choudhary		0	...	

13	7	MC Henriques	S Dhawan	A Choudhary	0	...
14	1	S Dhawan	MC Henriques	TS Mills	0	...
15	2	MC Henriques	S Dhawan	TS Mills	0	...
16	3	MC Henriques	S Dhawan	TS Mills	0	...
17	4	MC Henriques	S Dhawan	TS Mills	0	...
18	5	S Dhawan	MC Henriques	TS Mills	0	...
19	6	MC Henriques	S Dhawan	TS Mills	0	...

	bye_runs	legbye_runs	noball_runs	penalty_runs	batsman_runs	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	4	
3	0	0	0	0	0	
4	0	0	0	0	0	
5	0	0	0	0	0	
6	0	1	0	0	0	
7	0	0	0	0	1	
8	0	0	0	0	4	
9	0	0	1	0	0	
10	0	0	0	0	6	
11	0	0	0	0	0	
12	0	0	0	0	0	
13	0	0	0	0	4	
14	0	0	0	0	1	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	0	0	0	0	3	
18	0	0	0	0	1	
19	0	0	0	0	1	

	extra_runs	total_runs	player_dismissed	dismissal_kind	fielder
0	0	0	NaN	NaN	NaN
1	0	0	NaN	NaN	NaN
2	0	4	NaN	NaN	NaN
3	0	0	NaN	NaN	NaN
4	2	2	NaN	NaN	NaN
5	0	0	NaN	NaN	NaN
6	1	1	NaN	NaN	NaN
7	0	1	NaN	NaN	NaN
8	0	4	NaN	NaN	NaN
9	1	1	NaN	NaN	NaN
10	0	6	NaN	NaN	NaN
11	0	0	DA Warner	caught	Mandeep Singh
12	0	0	NaN	NaN	NaN
13	0	4	NaN	NaN	NaN
14	0	1	NaN	NaN	NaN
15	0	0	NaN	NaN	NaN

16	0	0	NaN	NaN	NaN
17	0	3	NaN	NaN	NaN
18	0	1	NaN	NaN	NaN
19	0	1	NaN	NaN	NaN

[20 rows x 21 columns]

```
[160]: deli.shape
```

```
[160]: (150460, 21)
```

```
[166]: a=deli.iloc[:,[6,15]]
```

```
[168]: a
```

```
[168]:
```

	batsman	batsman_runs
0	DA Warner	0
1	DA Warner	0
2	DA Warner	4
3	DA Warner	0
4	DA Warner	0
...
150455	Sachin Baby	2
150456	Sachin Baby	0
150457	Iqbal Abdulla	0
150458	Sachin Baby	1
150459	Iqbal Abdulla	4

[150460 rows x 2 columns]

```
[172]: mask=a['batsman']=='DA Warner'
```

```
[176]: deli[mask]
```

```
[176]:
```

	match_id	inning	batting_team	bowling_team	\
0	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
1	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
2	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
3	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
4	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
...	
150283	636	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
150284	636	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
150288	636	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
150291	636	1	Sunrisers Hyderabad	Royal Challengers Bangalore	
150292	636	1	Sunrisers Hyderabad	Royal Challengers Bangalore	

	over	ball	batsman	non_striker	bowler	is_super_over	...	\
--	------	------	---------	-------------	--------	---------------	-----	---

0	1	1	DA Warner	S Dhawan	TS Mills	0	...
1	1	2	DA Warner	S Dhawan	TS Mills	0	...
2	1	3	DA Warner	S Dhawan	TS Mills	0	...
3	1	4	DA Warner	S Dhawan	TS Mills	0	...
4	1	5	DA Warner	S Dhawan	TS Mills	0	...
...
150283	12	6	DA Warner	Yuvraj Singh	CJ Jordan	0	...
150284	13	1	DA Warner	Yuvraj Singh	YS Chahal	0	...
150288	13	5	DA Warner	Yuvraj Singh	YS Chahal	0	...
150291	14	2	DA Warner	Yuvraj Singh	S Aravind	0	...
150292	14	3	DA Warner	Yuvraj Singh	S Aravind	0	...

	bye_runs	legbye_runs	noball_runs	penalty_runs	batsman_runs	\
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	4
3	0	0	0	0	0	0
4	0	0	0	0	0	0
...
150283	0	0	0	0	0	1
150284	0	0	0	0	0	1
150288	0	0	0	0	0	1
150291	0	0	0	0	0	4
150292	0	0	0	0	0	0

	extra_runs	total_runs	player_dismissed	dismissal_kind	fielder
0	0	0	NaN	NaN	NaN
1	0	0	NaN	NaN	NaN
2	0	4	NaN	NaN	NaN
3	0	0	NaN	NaN	NaN
4	2	2	NaN	NaN	NaN
...
150283	0	1	NaN	NaN	NaN
150284	0	1	NaN	NaN	NaN
150288	0	1	NaN	NaN	NaN
150291	0	4	NaN	NaN	NaN
150292	0	0	DA Warner	caught	Iqbal Abdulla

[2902 rows x 21 columns]

```
[178]: a = deli.groupby('batsman')
```

```
[190]: a.size()
```

```
[190]: batsman
A Ashish Reddy      196
A Chandila          7
```



```

A Chopra          75
A Choudhary       20
A Flintoff        57
...
YV Takawale       183
Yashpal Singh     67
Younis Khan       7
Yuvraj Singh     2050
Z Khan            141
Length: 461, dtype: int64

```

```
[192]: a
```

```
[192]: <pandas.core.groupby.generic.DataFrameGroupBy object at 0x0000024881E43F50>
```

```
[198]: a.get_group('V Kohli')
```

```
[198]:
```

	match_id	inning	batting_team		bowling_team		\
2590	12	1	Royal Challengers Bangalore		Mumbai Indians		
2591	12	1	Royal Challengers Bangalore		Mumbai Indians		
2593	12	1	Royal Challengers Bangalore		Mumbai Indians		
2594	12	1	Royal Challengers Bangalore		Mumbai Indians		
2597	12	1	Royal Challengers Bangalore		Mumbai Indians		
...		
150410	636	2	Royal Challengers Bangalore	Sunrisers Hyderabad			
150413	636	2	Royal Challengers Bangalore	Sunrisers Hyderabad			
150414	636	2	Royal Challengers Bangalore	Sunrisers Hyderabad			
150415	636	2	Royal Challengers Bangalore	Sunrisers Hyderabad			
150416	636	2	Royal Challengers Bangalore	Sunrisers Hyderabad			

	over	ball	batsman	non_striker	bowler	is_super_over	\
2590	1	2	V Kohli	CH Gayle	TG Southee	0	
2591	1	3	V Kohli	CH Gayle	TG Southee	0	
2593	1	5	V Kohli	CH Gayle	TG Southee	0	
2594	1	6	V Kohli	CH Gayle	TG Southee	0	
2597	2	1	V Kohli	CH Gayle	Harbhajan Singh	0	
...	
150410	12	5	V Kohli	AB de Villiers	Bipul Sharma	0	
150413	13	2	V Kohli	AB de Villiers	BB Sran	0	
150414	13	3	V Kohli	AB de Villiers	BB Sran	0	
150415	13	4	V Kohli	AB de Villiers	BB Sran	0	
150416	13	5	V Kohli	AB de Villiers	BB Sran	0	

	...	bye_runs	legbye_runs	noball_runs	penalty_runs	batsman_runs	\
2590	...	0	0	0	0	0	
2591	...	0	0	0	0	1	
2593	...	0	0	0	0	0	

2594	...	0	0	0	0	1
2597	...	0	0	0	0	0
...
150410	...	0	0	0	0	1
150413	...	0	0	0	0	6
150414	...	0	0	0	0	2
150415	...	0	0	0	0	2
150416	...	0	0	0	0	0

	extra_runs	total_runs	player_dismissed	dismissal_kind	fielder
2590	1	1	NaN	NaN	NaN
2591	0	1	NaN	NaN	NaN
2593	0	0	NaN	NaN	NaN
2594	0	1	NaN	NaN	NaN
2597	0	0	NaN	NaN	NaN
...
150410	0	1	NaN	NaN	NaN
150413	0	6	NaN	NaN	NaN
150414	0	2	NaN	NaN	NaN
150415	0	2	NaN	NaN	NaN
150416	0	0	V Kohli	bowled	NaN

[3494 rows x 21 columns]

```
[200]: type(a)
```

```
[200]: pandas.core.groupby.generic.DataFrameGroupBy
```

```
[210]: a['batsman_runs'].sum().sort_values(ascending=False).head()
```

```
[210]: batsman
SK Raina      4548
V Kohli       4423
RG Sharma     4207
G Gambhir     4132
DA Warner     4014
Name: batsman_runs, dtype: int64
```

```
[212]: deli
```

```
[212]:      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
...        ...      ...                    ...
```

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
...	
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	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
...
150455	B Kumar	0	...	0	0	0
150456	B Kumar	0	...	0	0	0
150457	B Kumar	0	...	0	1	0
150458	B Kumar	0	...	0	0	0
150459	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
...
150455	0	2	0	2	NaN
150456	0	0	0	0	CJ Jordan
150457	0	0	1	1	NaN
150458	0	1	0	1	NaN
150459	0	4	0	4	NaN

	dismissal_kind	fielder
0	NaN	NaN

1		NaN	NaN
2		NaN	NaN
3		NaN	NaN
4		NaN	NaN
...	
150455		NaN	NaN
150456	run out	NV Ojha	
150457		NaN	NaN
150458		NaN	NaN
150459		NaN	NaN

[150460 rows x 21 columns]

```
[220]: a=deli.groupby('batsman')
```

```
[222]: a
```

```
[222]: <pandas.core.groupby.generic.DataFrameGroupBy object at 0x000002488504E390>
```

```
[289]: mask=deli['batsman_runs']==2
```

```
[291]: a=deli[mask]
```

```
[293]: a
```

```
[293]:
```

	match_id	inning	batting_team \
29	1	1	Sunrisers Hyderabad
50	1	1	Sunrisers Hyderabad
54	1	1	Sunrisers Hyderabad
55	1	1	Sunrisers Hyderabad
66	1	1	Sunrisers Hyderabad
...
150415	636	2	Royal Challengers Bangalore
150437	636	2	Royal Challengers Bangalore
150449	636	2	Royal Challengers Bangalore
150452	636	2	Royal Challengers Bangalore
150455	636	2	Royal Challengers Bangalore

	bowling_team	over	ball	batsman	non_striker \
29	Royal Challengers Bangalore	5	4	MC Henriques	S Dhawan
50	Royal Challengers Bangalore	9	1	S Dhawan	MC Henriques
54	Royal Challengers Bangalore	9	5	MC Henriques	S Dhawan
55	Royal Challengers Bangalore	9	6	MC Henriques	S Dhawan
66	Royal Challengers Bangalore	11	5	Yuvraj Singh	MC Henriques
...
150415	Sunrisers Hyderabad	13	4	V Kohli	AB de Villiers
150437	Sunrisers Hyderabad	17	2	SR Watson	Sachin Baby

150449	Sunrisers Hyderabad	19	2	CJ Jordan	Sachin Baby
150452	Sunrisers Hyderabad	19	5	Sachin Baby	CJ Jordan
150455	Sunrisers Hyderabad	20	2	Sachin Baby	CJ Jordan

	bowler	is_super_over	...	bye_runs	legbye_runs	\
29	S Aravind	0	...	0	0	
50	YS Chahal	0	...	0	0	
54	YS Chahal	0	...	0	0	
55	YS Chahal	0	...	0	0	
66	STR Binny	0	...	0	0	
...	
150415	BB Sran	0	...	0	0	
150437	Mustafizur Rahman	0	...	0	0	
150449	Mustafizur Rahman	0	...	0	0	
150452	Mustafizur Rahman	0	...	0	0	
150455	B Kumar	0	...	0	0	

	noball_runs	penalty_runs	batsman_runs	extra_runs	total_runs	\
29	0	0	2	0	2	
50	0	0	2	0	2	
54	0	0	2	0	2	
55	0	0	2	0	2	
66	0	0	2	0	2	
...	
150415	0	0	2	0	2	
150437	0	0	2	0	2	
150449	0	0	2	0	2	
150452	0	0	2	0	2	
150455	0	0	2	0	2	

	player_dismissed	dismissal_kind	fielder
29	NaN	NaN	NaN
50	NaN	NaN	NaN
54	NaN	NaN	NaN
55	NaN	NaN	NaN
66	NaN	NaN	NaN
...
150415	NaN	NaN	NaN
150437	NaN	NaN	NaN
150449	NaN	NaN	NaN
150452	NaN	NaN	NaN
150455	NaN	NaN	NaN

[9705 rows x 21 columns]

```
[295]: fours=a.groupby('batsman')['batsman_runs'].count()
```

```
[297]: fours.sort_values(ascending=False).head()
```

```
[297]: batsman
MS Dhoni      251
G Gambhir     245
SK Raina      242
V Kohli       242
DA Warner     207
Name: batsman_runs, dtype: int64
```

```
[299]: deli
```

```
[299]:      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
...      ...      ...
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
...      ...      ...
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  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
...      ...      ...
150455  B Kumar            0  ...        0            0            0
150456  B Kumar            0  ...        0            0            0
```

150457	B Kumar	0	...	0	1	0
150458	B Kumar	0	...	0	0	0
150459	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
...	
150455	0	2	0	2		NaN
150456	0	0	0	0	CJ Jordan	
150457	0	0	1	1		NaN
150458	0	1	0	1		NaN
150459	0	4	0	4		NaN

	dismissal_kind	fielder
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
...
150455	NaN	NaN
150456	run out	NV Ojha
150457	NaN	NaN
150458	NaN	NaN
150459	NaN	NaN

[150460 rows x 21 columns]

```
[323]: mask =
```

```
[327]: vir = deli[deli['batsman']=='V Kohli']
```

```
[341]: a=vir.groupby('bowling_team')['batsman_runs'].sum()
```

```
[347]: a.sort_values(ascending=False).head(3)
```

```
[347]: bowling_team
Chennai Super Kings    706
Delhi Daredevils       661
Kings XI Punjab        483
Name: batsman_runs, dtype: int64
```

```
[355]: def run_scored(batsman_name):
        vir = deli[deli['batsman']==batsman_name]
        a=vir.groupby('bowling_team')['batsman_runs'].sum()
        return a.sort_values(ascending=False).head(3)
```

```
[365]: run_scored('MS Dhoni')
```

```
[365]: bowling_team
Royal Challengers Bangalore    608
Mumbai Indians                 581
Kings XI Punjab                453
Name: batsman_runs, dtype: int64
```

```
[367]: deli
```

```
[367]:      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
...         ...      ...
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
...         ...      ...
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  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
...
150455	B Kumar	0	...	0	0	0
150456	B Kumar	0	...	0	0	0
150457	B Kumar	0	...	0	1	0
150458	B Kumar	0	...	0	0	0
150459	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
...
150455	0	2	0	2		NaN
150456	0	0	0	0	CJ Jordan	
150457	0	0	1	1		NaN
150458	0	1	0	1		NaN
150459	0	4	0	4		NaN

	dismissal_kind	fielder
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
...
150455	NaN	NaN
150456	run out	NV Ojha
150457	NaN	NaN
150458	NaN	NaN
150459	NaN	NaN

[150460 rows x 21 columns]

```
[369]: death=deli['over']>=16
```

```
[373]: death=deli[death]
```

```
[375]: death
```

```
[375]:
```

	match_id	inning	batting_team	\
93	1	1	Sunrisers Hyderabad	
94	1	1	Sunrisers Hyderabad	
95	1	1	Sunrisers Hyderabad	
96	1	1	Sunrisers Hyderabad	

97	1	1	Sunrisers Hyderabad
...
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 \
93	Royal Challengers Bangalore	16	1	MC Henriques	Yuvraj Singh
94	Royal Challengers Bangalore	16	2	MC Henriques	Yuvraj Singh
95	Royal Challengers Bangalore	16	3	Yuvraj Singh	DJ Hooda
96	Royal Challengers Bangalore	16	4	DJ Hooda	Yuvraj Singh
97	Royal Challengers Bangalore	16	5	Yuvraj Singh	DJ Hooda
...
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	noball_runs \
93	YS Chahal	0	...	0	0	0
94	YS Chahal	0	...	0	0	0
95	YS Chahal	0	...	0	0	0
96	YS Chahal	0	...	0	0	0
97	YS Chahal	0	...	0	0	0
...
150455	B Kumar	0	...	0	0	0
150456	B Kumar	0	...	0	0	0
150457	B Kumar	0	...	0	1	0
150458	B Kumar	0	...	0	0	0
150459	B Kumar	0	...	0	0	0

	penalty_runs	batsman_runs	extra_runs	total_runs	player_dismissed \
93	0	0	0	0	NaN
94	0	0	0	0	MC Henriques
95	0	1	0	1	NaN
96	0	1	0	1	NaN
97	0	1	0	1	NaN
...
150455	0	2	0	2	NaN
150456	0	0	0	0	CJ Jordan
150457	0	0	1	1	NaN
150458	0	1	0	1	NaN
150459	0	4	0	4	NaN

	dismissal_kind	fielder
93	NaN	NaN
94	caught	Sachin Baby
95	NaN	NaN
96	NaN	NaN
97	NaN	NaN
...
150455	NaN	NaN
150456	run out	NV Ojha
150457	NaN	NaN
150458	NaN	NaN
150459	NaN	NaN

[33737 rows x 21 columns]

```
[425]: run = death.groupby('batsman')['batsman_runs'].sum()
```

```
[427]: balls = death.groupby('batsman')['ball'].count()
```

```
[429]: run
```

```
[429]: batsman
A Ashish Reddy    214
A Chandila         4
A Chopra           1
A Choudhary       25
A Flintoff        25
...
YS Chahal         15
YV Takawale       29
Yashpal Singh     17
Yuvraj Singh     883
Z Khan           108
Name: batsman_runs, Length: 416, dtype: int64
```

```
[439]: balls
```

```
[439]: batsman
A Ashish Reddy    148
A Chandila         7
A Chopra           2
A Choudhary       20
A Flintoff        18
...
YS Chahal         27
YV Takawale       13
Yashpal Singh     13
```

```
Yuvraj Singh      516
Z Khan            109
Name: ball, Length: 416, dtype: int64
```

```
[441]: strike=run/balls
```

```
[443]: strike
```

```
[443]: batsman
      A Ashish Reddy      1.445946
      A Chandila         0.571429
      A Chopra           0.500000
      A Choudhary        1.250000
      A Flintoff         1.388889
      ...
      YS Chahal          0.555556
      YV Takawale        2.230769
      Yashpal Singh      1.307692
      Yuvraj Singh       1.711240
      Z Khan             0.990826
      Length: 416, dtype: float64
```

```
[459]: strike[balls>=200].sort_values(ascending=False)*100
```

```
[459]: batsman
      AB de Villiers      211.052632
      DA Warner           189.473684
      DA Miller           186.666667
      V Kohli             181.868132
      RG Sharma           175.668449
      DJ Hussey           175.213675
      RV Uthappa          173.454545
      Yuvraj Singh        171.124031
      JH Kallis           170.562771
      MS Dhoni            169.607843
      SPD Smith           169.303797
      JP Duminy           167.760618
      DJ Bravo            167.726161
      SK Raina            167.467249
      AT Rayudu           165.411765
      WP Saha             163.389831
      KA Pollard          161.336516
      YK Pathan           159.246575
      S Dhawan            158.847737
      BJ Hodge            157.402597
      AM Nayar            155.000000
      AM Rahane           152.985075
```

LRPL Taylor	152.941176
KD Karthik	152.051836
DPMD Jayawardene	152.032520
MK Pandey	151.785714
JA Morkel	149.882353
JP Faulkner	149.319728
S Badrinath	149.116608
Y Venugopal Rao	148.846154
Harbhajan Singh	147.607656
AD Mathews	147.058824
KM Jadhav	144.378698
STR Binny	144.036697
AR Patel	142.794760
IK Pathan	142.580645
MK Tiwary	140.189125
SS Tiwary	136.666667
NV Ojha	134.868421
RA Jadeja	130.729167
PP Chawla	120.257235
P Kumar	109.701493
R Vinay Kumar	108.936170
A Mishra	100.888889

dtype: float64

```
[471]: run[balls>=200]
```

```
[471]: batsman
```

A Mishra	227
AB de Villiers	1203
AD Mathews	425
AM Nayar	310
AM Rahane	410
AR Patel	327
AT Rayudu	703
BJ Hodge	606
DA Miller	672
DA Warner	432
DJ Bravo	686
DJ Hussey	410
DPMD Jayawardene	374
Harbhajan Singh	617
IK Pathan	663
JA Morkel	637
JH Kallis	394
JP Duminy	869
JP Faulkner	439
KA Pollard	1352

KD Karthik	704
KM Jadhav	488
LRPL Taylor	312
MK Pandey	340
MK Tiwary	593
MS Dhoni	2076
NV Ojha	410
P Kumar	294
PP Chawla	374
R Vinay Kumar	256
RA Jadeja	753
RG Sharma	1314
RV Uthappa	477
S Badrinath	422
S Dhawan	386
SK Raina	767
SPD Smith	535
SS Tiwary	410
STR Binny	314
V Kohli	993
WP Saha	482
Y Venugopal Rao	387
YK Pathan	930
Yuvraj Singh	883

Name: batsman_runs, dtype: int64

```
[473]: new = deli.merge(data,left_on='match_id',right_on='id')
```

```
[481]: new.groupby('season')
```

```
[481]: <pandas.core.groupby.generic.DataFrameGroupBy object at 0x00000248826181A0>
```

```
[487]: mask=deli['batsman_runs']==6
```

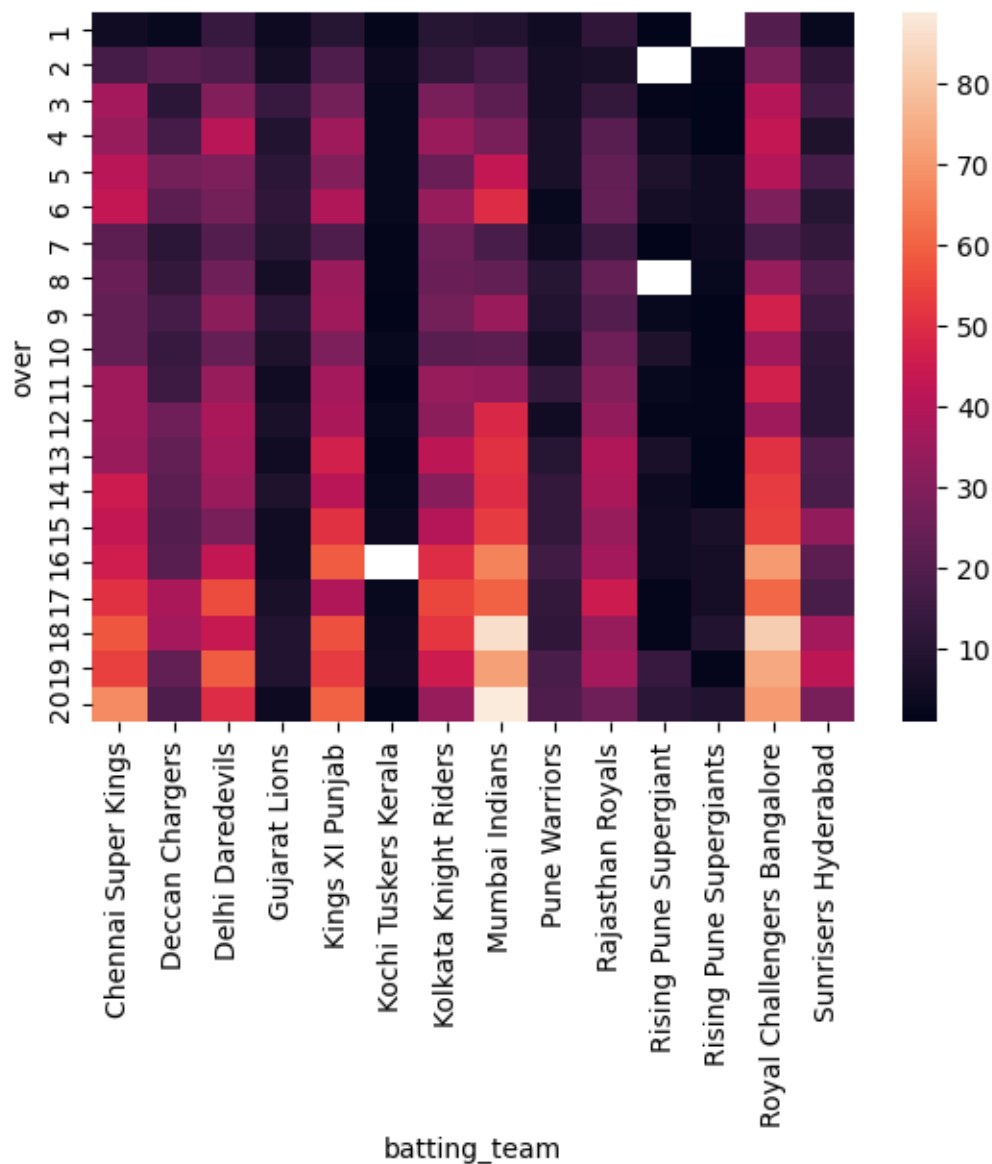
```
[491]: a=deli[mask]
```

```
[507]: at=a.  
      ↪pivot_table(index='over',columns='batting_team',values='batsman_runs',aggfunc='count')
```

```
[509]: import seaborn as sns
```

```
[511]: sns.heatmap(at)
```

```
[511]: <Axes: xlabel='batting_team', ylabel='over'>
```



```
[513]: data
```

```
[513]:
```

	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions

633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

		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	
..	
631	Royal Challengers Bangalore	Royal Challengers Bangalore		field	
632	Royal Challengers Bangalore	Royal Challengers Bangalore		field	
633	Kolkata Knight Riders	Kolkata Knight Riders		field	
634	Sunrisers Hyderabad	Sunrisers Hyderabad		field	
635	Royal Challengers Bangalore	Sunrisers Hyderabad		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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	

3		Holkar Cricket Stadium	AK Chaudhary
4		M Chinnaswamy Stadium	NaN
..	
631	Shaheed Veer Narayan Singh International Stadium		A Nand Kishore
632	M Chinnaswamy Stadium		AK Chaudhary
633	Feroz Shah Kotla		M Erasmus
634	Feroz Shah Kotla		M Erasmus
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN
634	CK Nandan	NaN
635	BNJ Oxenford	NaN

[636 rows x 18 columns]

[516]: deli

[516]:

	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
...
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
...
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	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	
...	
150455	B Kumar	0	...	0	0	0	
150456	B Kumar	0	...	0	0	0	
150457	B Kumar	0	...	0	1	0	
150458	B Kumar	0	...	0	0	0	
150459	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
...	
150455	0	2	0	2		NaN
150456	0	0	0	0	CJ Jordan	
150457	0	0	1	1		NaN
150458	0	1	0	1		NaN
150459	0	4	0	4		NaN

	dismissal_kind	fielder
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
...
150455	NaN	NaN
150456	run out	NV Ojha
150457	NaN	NaN
150458	NaN	NaN
150459	NaN	NaN

[150460 rows x 21 columns]

```
[520]: deli.corr()
```

```

-----
ValueError                                Traceback (most recent call last)
Cell In[520], line 1
----> 1 deli.corr()

File ~\anaconda3\Lib\site-packages\pandas\core\frame.py:11049, in DataFrame.
    corr(self, method, min_periods, numeric_only)
    11047 cols = data.columns
    11048 idx = cols.copy()
> 11049 mat = data.to_numpy(dtype=float, na_value=np.nan, copy=False)
    11051 if method == "pearson":
    11052     correl = libalgos.nancorr(mat, minp=min_periods)

File ~\anaconda3\Lib\site-packages\pandas\core\frame.py:1993, in DataFrame.
    to_numpy(self, dtype, copy, na_value)
    1991 if dtype is not None:
    1992     dtype = np.dtype(dtype)
-> 1993 result = self._mgr.as_array(dtype=dtype, copy=copy, na_value=na_value)
    1994 if result.dtype is not dtype:
    1995     result = np.asarray(result, dtype=dtype)

File ~\anaconda3\Lib\site-packages\pandas\core\internals\managers.py:1694, in
    BlockManager.as_array(self, dtype, copy, na_value)
    1692     arr.flags.writeable = False
    1693 else:
-> 1694     arr = self._interleave(dtype=dtype, na_value=na_value)
    1695     # The underlying data was copied within _interleave, so no need
    1696     # to further copy if copy=True or setting na_value
    1698 if na_value is lib.no_default:

File ~\anaconda3\Lib\site-packages\pandas\core\internals\managers.py:1753, in
    BlockManager._interleave(self, dtype, na_value)
    1751     else:
    1752         arr = blk.get_values(dtype)
-> 1753     result[rl.indexer] = arr
    1754     itemmask[rl.indexer] = 1
    1756 if not itemmask.all():

ValueError: could not convert string to float: 'Sunrisers Hyderabad'

```

[522]: data

[522]:	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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	
..	
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field	
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field	
633	Kolkata Knight Riders	Kolkata Knight Riders	field	
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field	
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

		venue	umpire1 \
0		Rajiv Gandhi International Stadium, Uppal	AY Dandekar
1		Maharashtra Cricket Association Stadium	A Nand Kishore
2		Saurashtra Cricket Association Stadium	Nitin Menon
3		Holkar Cricket Stadium	AK Chaudhary
4		M Chinnaswamy Stadium	NaN
..	
631	Shaheed Veer Narayan Singh International Stadium		A Nand Kishore
632		M Chinnaswamy Stadium	AK Chaudhary
633		Feroz Shah Kotla	M Erasmus
634		Feroz Shah Kotla	M Erasmus
635		M Chinnaswamy Stadium	HDPK Dharmasena

		umpire2	umpire3
0		NJ Llong	NaN
1		S Ravi	NaN
2		CK Nandan	NaN
3	C Shamshuddin		NaN
4		NaN	NaN
..	
631	BNJ Oxenford		NaN
632	HDPK Dharmasena		NaN
633	C Shamshuddin		NaN
634	CK Nandan		NaN
635	BNJ Oxenford		NaN

[636 rows x 18 columns]

```
[528]: data.rename(columns={'city':'place'},inplace=True)
```

```
[530]: data
```

```
[530]:
```

	id	season	place	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	

```

633          Feroz Shah Kotla      M Erasmus
634          Feroz Shah Kotla      M Erasmus
635      M Chinnaswamy Stadium  HDPK Dharmasena

```

```

          umpire2 umpire3
0      NJ Llong      NaN
1      S Ravi      NaN
2      CK Nandan      NaN
3      C Shamshuddin      NaN
4      NaN      NaN
..      ...      ...
631      BNJ Oxenford      NaN
632      HDPK Dharmasena      NaN
633      C Shamshuddin      NaN
634      CK Nandan      NaN
635      BNJ Oxenford      NaN

```

[636 rows x 18 columns]

[532]: data

```

[532]:      id  season    place    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
..      ...      ...      ...      ...
631  632    2016   Raipur  2016-05-22      Delhi Daredevils
632  633    2016  Bangalore  2016-05-24      Gujarat Lions
633  634    2016    Delhi  2016-05-25      Sunrisers Hyderabad
634  635    2016    Delhi  2016-05-27      Gujarat Lions
635  636    2016  Bangalore  2016-05-29      Sunrisers Hyderabad

          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
..      ...      ...      ...
631  Royal Challengers Bangalore  Royal Challengers Bangalore      field
632  Royal Challengers Bangalore  Royal Challengers Bangalore      field
633      Kolkata Knight Riders      Kolkata Knight Riders      field
634      Sunrisers Hyderabad      Sunrisers Hyderabad      field
635  Royal Challengers Bangalore      Sunrisers Hyderabad      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	
..	
631	normal	0	Royal Challengers Bangalore	0	
632	normal	0	Royal Challengers Bangalore	0	
633	normal	0	Sunrisers Hyderabad	22	
634	normal	0	Sunrisers Hyderabad	0	
635	normal	0	Sunrisers Hyderabad	8	

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN


```

632  HDPK Dharmasena      NaN
633   C Shamshuddin      NaN
634   CK Nandan          NaN
635   BNJ Oxenford       NaN

```

[636 rows x 18 columns]

```
[536]: data.set_index('id',inplace=True)
```

```
[538]: data
```

```

[538]:      season    place    date                                team1 \
id
1      2017  Hyderabad  2017-04-05          Sunrisers Hyderabad
2      2017      Pune  2017-04-06          Mumbai Indians
3      2017   Rajkot  2017-04-07          Gujarat Lions
4      2017   Indore  2017-04-08    Rising Pune Supergiant
5      2017  Bangalore  2017-04-08  Royal Challengers Bangalore
..      ...      ...      ...      ...
632    2016   Raipur  2016-05-22          Delhi Daredevils
633    2016  Bangalore  2016-05-24          Gujarat Lions
634    2016    Delhi  2016-05-25    Sunrisers Hyderabad
635    2016    Delhi  2016-05-27          Gujarat Lions
636    2016  Bangalore  2016-05-29    Sunrisers Hyderabad

                                team2      toss_winner toss_decision \
id
1  Royal Challengers Bangalore  Royal Challengers Bangalore      field
2    Rising Pune Supergiant    Rising Pune Supergiant      field
3    Kolkata Knight Riders    Kolkata Knight Riders      field
4      Kings XI Punjab      Kings XI Punjab      field
5      Delhi Daredevils  Royal Challengers Bangalore      bat
..      ...      ...      ...
632  Royal Challengers Bangalore  Royal Challengers Bangalore      field
633  Royal Challengers Bangalore  Royal Challengers Bangalore      field
634    Kolkata Knight Riders    Kolkata Knight Riders      field
635    Sunrisers Hyderabad    Sunrisers Hyderabad      field
636  Royal Challengers Bangalore    Sunrisers Hyderabad      bat

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

```

632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Royal Challengers Bangalore	0
634	normal	0	Sunrisers Hyderabad	22
635	normal	0	Sunrisers Hyderabad	0
636	normal	0	Sunrisers Hyderabad	8

	win_by_wickets	player_of_match	\
id			
1	0	Yuvraj Singh	
2	7	SPD Smith	
3	10	CA Lynn	
4	6	GJ Maxwell	
5	0	KM Jadhav	
..	
632	6	V Kohli	
633	4	AB de Villiers	
634	0	MC Henriques	
635	4	DA Warner	
636	0	BCJ Cutting	

	venue	umpire1	\
id			
1	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
2	Maharashtra Cricket Association Stadium	A Nand Kishore	
3	Saurashtra Cricket Association Stadium	Nitin Menon	
4	Holkar Cricket Stadium	AK Chaudhary	
5	M Chinnaswamy Stadium	NaN	
..	
632	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
633	M Chinnaswamy Stadium	AK Chaudhary	
634	Feroz Shah Kotla	M Erasmus	
635	Feroz Shah Kotla	M Erasmus	
636	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2	umpire3
id		
1	NJ Llong	NaN
2	S Ravi	NaN
3	CK Nandan	NaN
4	C Shamshuddin	NaN
5	NaN	NaN
..
632	BNJ Oxenford	NaN
633	HDPK Dharmasena	NaN
634	C Shamshuddin	NaN
635	CK Nandan	NaN
636	BNJ Oxenford	NaN

[636 rows x 17 columns]

```
[540]: data.reset_index(inplace=True)
```

```
[542]: data
```

```
[542]:
```

	id	season	place	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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
..
631	normal	0	Royal Challengers Bangalore	0
632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Sunrisers Hyderabad	22
634	normal	0	Sunrisers Hyderabad	0
635	normal	0	Sunrisers Hyderabad	8

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

0	0	Yuvraj Singh
1	7	SPD Smith
2	10	CA Lynn
3	6	GJ Maxwell
4	0	KM Jadhav
..
631	6	V Kohli
632	4	AB de Villiers
633	0	MC Henriques
634	4	DA Warner
635	0	BCJ Cutting

	venue	umpire1 \
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar
1	Maharashtra Cricket Association Stadium	A Nand Kishore
2	Saurashtra Cricket Association Stadium	Nitin Menon
3	Holkar Cricket Stadium	AK Chaudhary
4	M Chinnaswamy Stadium	NaN
..
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore
632	M Chinnaswamy Stadium	AK Chaudhary
633	Feroz Shah Kotla	M Erasmus
634	Feroz Shah Kotla	M Erasmus
635	M Chinnaswamy Stadium	HDPK Dharmasena

	umpire2	umpire3
0	NJ Llong	NaN
1	S Ravi	NaN
2	CK Nandan	NaN
3	C Shamshuddin	NaN
4	NaN	NaN
..
631	BNJ Oxenford	NaN
632	HDPK Dharmasena	NaN
633	C Shamshuddin	NaN
634	CK Nandan	NaN
635	BNJ Oxenford	NaN

[636 rows x 18 columns]

```
[570]: data['winner'].value_counts()
```

```
[570]: winner
Mumbai Indians          92
Chennai Super Kings     79
Kolkata Knight Riders   77
Royal Challengers Bangalore 73
```

Kings XI Punjab	70
Rajasthan Royals	63
Delhi Daredevils	62
Sunrisers Hyderabad	42
Deccan Chargers	29
Gujarat Lions	13
Pune Warriors	12
Rising Pune Supergiant	10
Kochi Tuskers Kerala	6
Rising Pune Supergiants	5

Name: count, dtype: int64

```
[590]: data.dropna(axis=1,how='all',inplace=True)
```

```
[592]: data
```

```
[592]:
```

	id	season	place	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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
..
631	normal	0	Royal Challengers Bangalore	0
632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Sunrisers Hyderabad	22
634	normal	0	Sunrisers Hyderabad	0
635	normal	0	Sunrisers Hyderabad	8

	win_by_wickets	player_of_match	\
0	0	Yuvraj Singh	
1	7	SPD Smith	
2	10	CA Lynn	
3	6	GJ Maxwell	
4	0	KM Jadhav	
..	
631	6	V Kohli	
632	4	AB de Villiers	
633	0	MC Henriques	
634	4	DA Warner	
635	0	BCJ Cutting	

	venue	umpire1	\
0	Rajiv Gandhi International Stadium, Uppal	AY Dandekar	
1	Maharashtra Cricket Association Stadium	A Nand Kishore	
2	Saurashtra Cricket Association Stadium	Nitin Menon	
3	Holkar Cricket Stadium	AK Chaudhary	
4	M Chinnaswamy Stadium	NaN	
..	
631	Shaheed Veer Narayan Singh International Stadium	A Nand Kishore	
632	M Chinnaswamy Stadium	AK Chaudhary	
633	Feroz Shah Kotla	M Erasmus	
634	Feroz Shah Kotla	M Erasmus	
635	M Chinnaswamy Stadium	HDPK Dharmasena	

	umpire2
0	NJ Llong
1	S Ravi
2	CK Nandan
3	C Shamshuddin
4	NaN
..	...
631	BNJ Oxenford
632	HDPK Dharmasena
633	C Shamshuddin
634	CK Nandan
635	BNJ Oxenford

[636 rows x 17 columns]

```
[606]: data['winner'].fillna("Nahi Pata", inplace=True)
```

```
[608]: data
```

```
[608]:
```

	id	season	place	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
..
631	632	2016	Raipur	2016-05-22	Delhi Daredevils
632	633	2016	Bangalore	2016-05-24	Gujarat Lions
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad
634	635	2016	Delhi	2016-05-27	Gujarat Lions
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad

	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
..
631	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	Kolkata Knight Riders	Kolkata Knight Riders	field
634	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	Royal Challengers Bangalore	Sunrisers Hyderabad	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
..
631	normal	0	Royal Challengers Bangalore	0
632	normal	0	Royal Challengers Bangalore	0
633	normal	0	Sunrisers Hyderabad	22
634	normal	0	Sunrisers Hyderabad	0
635	normal	0	Sunrisers Hyderabad	8

	win_by_wickets	player_of_match \
0	0	Yuvraj Singh

```

1          7      SPD Smith
2          10     CA Lynn
3          6      GJ Maxwell
4          0      KM Jadhav
..          ...
631         6      V Kohli
632         4  AB de Villiers
633         0      MC Henriques
634         4      DA Warner
635         0      BCJ Cutting

```

```

                                venue      umpire1 \
0      Rajiv Gandhi International Stadium, Uppal      AY Dandekar
1      Maharashtra Cricket Association Stadium  A Nand Kishore
2      Saurashtra Cricket Association Stadium      Nitin Menon
3      Holkar Cricket Stadium      AK Chaudhary
4      M Chinnaswamy Stadium      NaN
..          ...
631  Shaheed Veer Narayan Singh International Stadium  A Nand Kishore
632      M Chinnaswamy Stadium      AK Chaudhary
633      Feroz Shah Kotla      M Erasmus
634      Feroz Shah Kotla      M Erasmus
635      M Chinnaswamy Stadium  HDPK Dharmasena

```

```

                                umpire2
0      NJ Llong
1      S Ravi
2      CK Nandan
3      C Shamshuddin
4      NaN
..          ...
631      BNJ Oxenford
632  HDPK Dharmasena
633      C Shamshuddin
634      CK Nandan
635      BNJ Oxenford

```

[636 rows x 17 columns]

```
[622]: data[data['winner']=="Nahi Pata"]
```

```

[622]:      id  season    place    date      team1 \
300  301    2011     Delhi  2011-05-21      Delhi Daredevils
545  546    2015  Bangalore  2015-04-29  Royal Challengers Bangalore
570  571    2015  Bangalore  2015-05-17      Delhi Daredevils

                                team2      toss_winner toss_decision \

```


300	Pune Warriors	Delhi Daredevils	bat
545	Rajasthan Royals	Rajasthan Royals	field
570	Royal Challengers Bangalore	Royal Challengers Bangalore	field

	result	dl_applied	winner	win_by_runs	win_by_wickets	\
300	no result	0	Nahi Pata	0	0	
545	no result	0	Nahi Pata	0	0	
570	no result	0	Nahi Pata	0	0	

	player_of_match	venue	umpire1	umpire2
300	NaN	Feroz Shah Kotla	SS Hazare	RJ Tucker
545	NaN	M Chinnaswamy Stadium	JD Cloete	PG Pathak
570	NaN	M Chinnaswamy Stadium	HDPK Dharmasena	K Srinivasan

```
[644]: data
```

```
[648]: data[data['winner']=="Nahi Pata"]
```

```
[648]:
```

	id	season	place	date	team1	\
300	301	2011	Delhi	2011-05-21	Delhi Daredevils	
545	546	2015	Bangalore	2015-04-29	Royal Challengers Bangalore	
570	571	2015	Bangalore	2015-05-17	Delhi Daredevils	

	team2	toss_winner	toss_decision	\
300	Pune Warriors	Delhi Daredevils	bat	
545	Rajasthan Royals	Rajasthan Royals	field	
570	Royal Challengers Bangalore	Royal Challengers Bangalore	field	

	result	dl_applied	winner	win_by_runs	win_by_wickets	\
300	no result	0	Nahi Pata	0	0	
545	no result	0	Nahi Pata	0	0	
570	no result	0	Nahi Pata	0	0	

	player_of_match	venue	umpire1	umpire2
300	NaN	Feroz Shah Kotla	SS Hazare	RJ Tucker
545	NaN	M Chinnaswamy Stadium	JD Cloete	PG Pathak
570	NaN	M Chinnaswamy Stadium	HDPK Dharmasena	K Srinivasan

```
[ ]:
```