```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model selection import train test split
from sklearn.ensemble import RandomForestClassifier
from sklearn.linear model import LogisticRegression
match=pd.read csv(r"C:\Users\Admin\Downloads\matches.csv")
match.head()
   id
       season
                    city
                                date
                                                             team1 \
0
         2017
               Hyderabad
                          2017-04-05
                                               Sunrisers Hyderabad
    1
    2
         2017
                          2017-04-06
                                                    Mumbai Indians
1
                    Pune
2
    3
         2017
                  Rajkot
                          2017-04-07
                                                     Gujarat Lions
3
    4
         2017
                  Indore 2017-04-08
                                            Rising Pune Supergiant
4
                                      Royal Challengers Bangalore
    5
         2017
               Bangalore 2017-04-08
                         team2
                                                 toss winner
toss decision \
0 Royal Challengers Bangalore Royal Challengers Bangalore
field
        Rising Pune Supergiant
                                     Rising Pune Supergiant
1
field
         Kolkata Knight Riders
                                      Kolkata Knight Riders
2
field
               Kings XI Punjab
                                             Kings XI Punjab
field
4
              Delhi Daredevils Royal Challengers Bangalore
bat
   result
           dl applied
                                             winner
                                                     win by runs \
   normal
                               Sunrisers Hyderabad
                                                              35
                    0
                    0
1
   normal
                            Rising Pune Supergiant
                                                               0
2
                    0
                             Kolkata Knight Riders
                                                               0
   normal
                                   Kings XI Punjab
3
   normal
                    0
                                                               0
  normal
                       Royal Challengers Bangalore
                                                              15
   win by wickets player of match
venue \
                     Yuvraj Singh Rajiv Gandhi International Stadium,
Uppal
                7
                                     Maharashtra Cricket Association
                        SPD Smith
Stadium
               10
                          CA Lynn
                                      Saurashtra Cricket Association
Stadium
                6
                       GJ Maxwell
                                                       Holkar Cricket
Stadium
                0
                        KM Jadhav
                                                        M Chinnaswamy
Stadium
```

```
umpire2 umpire3
          umpire1
      AY Dandekar
                         NJ Llong
                                      NaN
1
   A Nand Kishore
                           S Ravi
                                      NaN
      Nitin Menon
2
                        CK Nandan
                                      NaN
3
     AK Chaudhary
                   C Shamshuddin
                                      NaN
4
              NaN
                              NaN
                                      NaN
match.replace('supergiants','supergiant ',inplace=True)
match.info()
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 756 entries, 0 to 755
Data columns (total 18 columns):
     Column
                      Non-Null Count
                                       Dtype
     -----
- - -
 0
     id
                      756 non-null
                                       int64
 1
                       756 non-null
     season
                                       int64
 2
                      749 non-null
                                       object
     city
 3
     date
                      756 non-null
                                       object
 4
                      756 non-null
     team1
                                       object
 5
     team2
                      756 non-null
                                       object
 6
     toss winner
                      756 non-null
                                       object
 7
     toss decision
                      756 non-null
                                       object
 8
     result
                      756 non-null
                                       object
 9
     dl applied
                      756 non-null
                                       int64
 10
    winner
                      752 non-null
                                       object
     win_by_runs
 11
                      756 non-null
                                       int64
 12
    win by wickets
                      756 non-null
                                       int64
 13
     player of match
                      752 non-null
                                       object
                      756 non-null
 14
    venue
                                       object
 15
    umpire1
                       754 non-null
                                       object
                      754 non-null
 16
     umpire2
                                       object
                                       object
 17
     umpire3
                       119 non-null
dtypes: int64(5), object(13)
memory usage: 106.4+ KB
match.describe()
                 id
                           season
                                   dl applied win by runs
win by wickets
         756.000000
                       756.000000
                                   756.000000
                                                 756.000000
count
756.000000
mean
        1792.178571
                     2013.444444
                                     0.025132
                                                  13.283069
3.350529
                         3.366895
                                     0.156630
                                                  23.471144
std
        3464.478148
3.387963
                                                   0.000000
min
           1.000000
                     2008.000000
                                     0.000000
0.000000
```

```
25%
         189.750000
                      2011.000000
                                      0.000000
                                                    0.000000
0.000000
50%
         378.500000
                      2013.000000
                                      0.000000
                                                    0.000000
4.000000
75%
         567.250000
                      2016.000000
                                      0.000000
                                                   19.000000
6.000000
                      2019.000000
                                                  146.000000
       11415.000000
                                      1.000000
max
10.000000
match.dtypes
id
                     int64
                     int64
season
                    object
city
                    object
date
team1
                    object
team2
                    object
toss_winner
                    object
toss decision
                    object
result
                    object
dl applied
                     int64
winner
                    object
win_by_runs
                     int64
win_by_wickets
                     int64
player of match
                    object
                    object
venue
                    object
umpire1
umpire2
                    object
umpire3
                    object
dtype: object
match.shape
(756, 18)
match.isnull().sum()
id
                      0
                      0
season
city
                      7
                      0
date
                      0
team1
team2
                      0
                      0
toss winner
toss decision
                      0
result
                      0
dl applied
                      0
                      4
winner
win_by_runs
                      0
                      0
win by wickets
player_of_match
                      4
```

venue 0
umpirel 2
umpire2 2
umpire3 637

dtype: int64

match.dropna(0)

C:\Users\Admin\AppData\Local\Temp\ipykernel\_8420\2959912194.py:1: FutureWarning: In a future version of pandas all arguments of DataFrame.dropna will be keyword-only.

match.dropna(0)

illacci	i.ui opiid	a(0)			
team1	id se	eason	city	date	
	7894	2018	Mumbai	07/04/18	Mumbai
	7895	2018	Mohali	08/04/18	Delhi
638	7896	2018	Kolkata	08/04/18	Royal Challengers
Bangalo 639 Royals	7897	2018	Hyderabad	09/04/18	Rajasthan
	7898	2018	Chennai	10/04/18	Kolkata Knight
	1346	2019	Mohali	05/05/19	Chennai Super
	1347	2019	Mumbai	05/05/19	Kolkata Knight
	1412	2019	Chennai	07/05/19	Chennai Super
	1414 Is	2019	Visakhapatnam	10/05/19	Delhi
•	1415	2019	Hyderabad	12/05/19	Mumbai
Thatan	,				
result	\		team2	toss_w	inner toss_decision
636 normal	•	i Super	Kings Chenr	nai Super I	Kings field
637 normal	Ki	ngs XI	Punjab ł	Kings XI P	unjab field
	olkata H	Knight	Riders Kolkata	a Knight R	iders field
639 normal	Sunrise	ers Hyd	erabad Sunr	isers Hyde	rabad field
640 normal	Chenna	i Super	Kings Chenr	nai Super I	Kings field

750	Kings XI Punjab	Kings XI Punjab	field
normal 751	Mumbai Indians	Mumbai Indians	field
normal 752	Mumbai Indians	Chennai Super Kings	bat
normal 754	Chennai Super Kings	Chennai Super Kings	field
normal 755	Chennai Super Kings	Mumbai Indians	bat
normal			
636 637 638 639 640  750 751 752 754	0 Kings 0 Kolkata Kni 0 Sunrisers 0 Chennai S 0 Kings 0 Mumb 0 Mumb	Hyderabad 0 uper Kings 0 XI Punjab 0 ai Indians 0 ai Indians 0 uper Kings 0	win_by_wickets \
755	0 Mumb	ai Indians 1	0
pl \	ayer_of_match		venue
636	DJ Bravo		Wankhede Stadium
637	KL Rahul Punjab	Cricket Association IS B	indra Stadium,
638	SP Narine		Eden Gardens
639	S Dhawan	Rajiv Gandhi Internatio	nal Stadium, Uppal
640	SW Billings	MA Chidambara	m Stadium, Chepauk
750	KL Rahul		IS Bindra Stadium
751	HH Pandya		Wankhede Stadium
752	AS Yadav	M. A. C	hidambaram Stadium
754	F du Plessis		ACA-VDCA Stadium
755	JJ Bumrah	Rajiv Gandhi Int	l. Cricket Stadium

```
umpire2
                   umpire1
umpire3
636
            Chris Gaffaney
                                 A Nanda Kishore
                                                            Anil
Chaudhary
637
                Rod Tucker K Ananthapadmanabhan
                                                               Nitin
Menon
             C Shamshuddin
                                     A.D Deshmukh
                                                                    S
638
Ravi
639
               Nigel Llong
                                  Vineet Kulkarni
                                                                  0
Nandan
            Anil Chaudhary
640
                                  Chris Gaffaney
                                                           A Nanda
Kishore
750
     KN Ananthapadmanabhan
                                    C Shamshuddin
                                                            Bruce
0xenford
             Nanda Kishore
                                         0 Nandan
                                                                    S
751
Ravi
               Nigel Llong
                                      Nitin Menon
                                                                 Ian
752
Gould
             Sundaram Ravi
                                   Bruce Oxenford Chettithody
754
Shamshuddin
755
               Nitin Menon
                                        Ian Gould
                                                               Nigel
Llong
[118 rows x 18 columns]
match['winner'].replace('',np.nan, inplace=True)
match['city'].replace('',np.nan, inplace=True)
match['player of match'].replace('',np.nan, inplace=True)
match['umpire1'].replace('',np.nan, inplace=True)
match['umpire2'].replace('',np.nan, inplace=True)
match['umpire3'].replace('',np.nan, inplace=True)
match.dropna(subset=['winner'],inplace=True)
match.dropna(subset=['city'],inplace=True)
match.dropna(subset=['player of match'],inplace=True)
match.dropna(subset=['umpire1'],inplace=True)
match.dropna(subset=['umpire2'],inplace=True)
match.dropna(subset=['umpire3'],inplace=True)
```

```
match.isnull().sum()
id
                    0
                    0
season
                    0
city
date
                    0
                    0
team1
                    0
team2
toss winner
                    0
toss decision
                    0
result
                    0
dl applied
                    0
winner
                    0
win by runs
                    0
win by wickets
                    0
player of match
                    0
venue
                    0
umpire1
                    0
umpire2
                    0
umpire3
                    0
dtype: int64
delivery=pd.read csv(r"C:\Users\Admin\Downloads\deliveries.csv\
deliveries.csv")
delivery.head()
   match id inning
                             batting team
                                                           bowling team
over \
0
          1
                     Sunrisers Hyderabad
                                           Royal Challengers Bangalore
1
1
                                           Royal Challengers Bangalore
                     Sunrisers Hyderabad
1
2
          1
                     Sunrisers Hyderabad
                                           Royal Challengers Bangalore
1
3
          1
                     Sunrisers Hyderabad
                                           Royal Challengers Bangalore
1
4
                     Sunrisers Hyderabad
                                           Royal Challengers Bangalore
1
           batsman non striker
   ball
                                   bowler
                                            is super over ...
                                                                bye runs
                      S Dhawan
                                 TS Mills
0
      1
         DA Warner
                                                        0
                                                                        0
      2
                      S Dhawan
                                TS Mills
         DA Warner
                                                                        0
      3
         DA Warner
                      S Dhawan
                                TS Mills
                                                                        0
         DA Warner
                      S Dhawan
                                TS Mills
                                                                        0
                                                                        0
      5
         DA Warner
                      S Dhawan
                                TS Mills
                                                        0
```

```
legbye runs
                noball runs
                              penalty runs
                                             batsman runs
                                                            extra runs
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
                                                                     2
   total runs
               player dismissed dismissal kind fielder
0
                             NaN
                                             NaN
                                                      NaN
1
            0
                             NaN
                                             NaN
                                                     NaN
2
            4
                             NaN
                                             NaN
                                                     NaN
3
            0
                                             NaN
                                                     NaN
                             NaN
4
            2
                             NaN
                                             NaN
                                                     NaN
[5 rows x 21 columns]
delivery.info()
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 179078 entries, 0 to 179077
Data columns (total 21 columns):
#
     Column
                        Non-Null Count
                                          Dtype
- - -
 0
     match id
                        179078 non-null
                                          int64
 1
     inning
                        179078 non-null
                                          int64
 2
     batting team
                        179078 non-null
                                          object
 3
     bowling team
                        179078 non-null
                                          object
 4
                        179078 non-null
                                          int64
     over
 5
     ball
                        179078 non-null
                                          int64
 6
     batsman
                        179078 non-null
                                          object
 7
                        179078 non-null
     non striker
                                          object
 8
     bowler
                        179078 non-null
                                          object
 9
     is super over
                        179078 non-null
                                          int64
 10
    wide runs
                        179078 non-null
                                          int64
 11
     bye runs
                        179078 non-null
                                          int64
 12
     legbye runs
                        179078 non-null
                                          int64
 13
     noball runs
                        179078 non-null
                                          int64
 14
     penalty runs
                        179078 non-null
                                          int64
 15
     batsman runs
                        179078 non-null
                                          int64
 16
     extra runs
                        179078 non-null
                                          int64
                        179078 non-null
 17
     total runs
                                          int64
     player dismissed
                        8834 non-null
 18
                                          object
 19
     dismissal kind
                        8834 non-null
                                          object
 20
     fielder
                        6448 non-null
                                          object
dtypes: int64(13), object(8)
memory usage: 28.7+ MB
delivery.replace('supergiants','supergiant ',inplace=True)
```

```
delivery.shape
(179078, 21)
delivery.dtypes
match id
                      int64
inning
                      int64
batting team
                     object
bowling_team
                     object
                      int64
over
ball
                      int64
batsman
                     object
non striker
                     object
bowler
                     object
is_super_over
                      int64
wide_runs
                      int64
bye runs
                      int64
legbye_runs
                      int64
noball runs
                      int64
penalty_runs
                      int64
batsman runs
                      int64
extra runs
                      int64
total runs
                      int64
player dismissed
                     object
dismissal kind
                     object
fielder
                     object
dtype: object
delivery.isnull().sum()
match id
                          0
                           0
inning
batting team
                           0
                           0
bowling_team
over
                          0
                           0
ball
                           0
batsman
non striker
                           0
bowler
                          0
is_super_over
                          0
                          0
wide runs
bye runs
                          0
                          0
legbye runs
noball runs
                          0
penalty runs
                          0
batsman runs
                          0
extra runs
                          0
total runs
                          0
player_dismissed
                     170244
```

dismissal\_kind 170244 fielder 172630

dtype: int64

delivery.dropna(0)

C:\Users\Admin\AppData\Local\Temp\ipykernel\_8420\2485708266.py:1: FutureWarning: In a future version of pandas all arguments of DataFrame.dropna will be keyword-only.

delivery.dropna(0)

11 64 94 165 199	match <sub>_</sub>	_id 1 1 1 1	innin	1 1 1 2 I		Su Su Chal	nrise nrise nrise lenge	patting rs Hyde rs Hyde rs Hyde rs Bang rs Bang	erabad erabad erabad galore	\	
178977 179019 179033 179067 179075	114 114 114 114	415 415 415 415 415 415	• •	2 2 2 2 2		Ch Ch Ch	ennai ennai ennai	Super Super Super Super Super	Kings Kings Kings		
				bow	ling_t	eam	over	ball		batsman	
non_str 11			llongo	rc l	Bangal	oro	2	5	DΛ	Warner	S
Dhawan	Ruyat	Clia	ctenge	:15 1	banyat	ore	2	3	DΑ	warner	3
64	Royal	Cha	llenge	rs I	Bangal	ore	11	3	S	Dhawan	MC
Henriqu											
94	Royal	Cha	llenge	rs I	Bangal	ore	16	2	MC He	nriques	Yuvraj
Singh		_					-	_	6		T.4
165 Head		St	unrise	ers I	Hydera	bad	7	3	C	H Gayle	TM
199		Sı	unrise	rs I	Hydera	bad	12	4	KM	Jadhav	TM
Head					•						
							_				
178977			Mu	ımba:	i Indi	ans	4	6	F du	Plessis	SR
Watson 179019			Mu	ımhə	i Indi	anc	11	3	۸Т	Rayudu	SR
Watson			M	iliba.	I IIIGI	alis	11	J	Aı	Nayuuu	311
179033			Mu	mba:	i Indi	ans	13	5	SR	Watson	MS
Dhoni											
179067			Mu	ımba:	i Indi	ans	19	2	D.	J Bravo	SR
Watson							20		CD		5.4
179075			Mu	ımba:	i Indi	ans	20	4	SR	Watson	RA
Jadeja											
		bow	ler i	S_SI	uper_o	ver		bye_r	uns le	gbye_run	S
				_	_			_		_	

noball_ru	uns \				
11	A Choudhary	0		0	0
0	•				
64	STR Binny	0		0	Θ
0	• · · · · · · · · · · · · · · · · ·	_		_	-
94	YS Chahal	0		0	0
0	15 Chanac	U		O	U
165	DJ Hooda	0		0	0
	DJ HUUUA	U		U	U
0	4C Hamai and	0		0	0
	MC Henriques	0		0	0
0					
178977	KH Pandya	0		0	0
0					
179019	JJ Bumrah	0		0	0
0					
179033	HH Pandya	0		0	0
0	,				
179067	JJ Bumrah	0		Θ	0
0	55 Baill all	· ·		· ·	· ·
179075	SL Malinga	Θ		0	0
0	JE Hattinga	U		U	U
U					
,	penalty_runs	batsman_runs	evtra runc	total_runs	
player_di		bacsillari_ruris	extra_runs	totat_runs	
		0	Θ	0	DA
11	0	U	U	0	DΑ
Warner	0	0	0	0	C
64	0	0	0	0	S
Dhawan					
94	0	0	0	0	MC
Henriques					
165	0	0	0	0	CH
Gayle					
199	0	1	0	1	KM
Jadhav					
178977	0	0	0	0	F du
Plessis	0	0	U	0	ı uu
179019	0	0	Θ	0	AT
	U	U	U	U	Al
Rayudu 179033	0	1	0	1	MC
	0	1	0	1	MS
Dhoni	^	0	0	^	D.7
179067	0	0	0	0	DJ
Bravo					
179075	0	1	0	1	SR
Watson					

```
dismissal kind
                               fielder
11
                        Mandeep Singh
                caught
64
                caught
                           Sachin Baby
94
                caught
                           Sachin Baby
165
                caught
                             DA Warner
199
                           BCJ Cutting
               run out
178977
                             Q de Kock
               stumped
                             Q de Kock
179019
                caught
179033
               run out
                          Ishan Kishan
179067
                caught
                             Q de Kock
179075
               run out
                             KH Pandya
[6448 rows x 21 columns]
total_score_df=delivery.groupby(['match_id','inning']).sum()
['total runs']
total score df
match id inning
                     207
          1
          2
                     172
2
          1
                     184
          2
                     187
3
          1
                     183
          2
11413
                     170
11414
          1
                     155
          2
                     162
          1
                     152
11415
          2
                     157
Name: total runs, Length: 1528, dtype: int64
total score df=delivery.groupby(['match id','inning']).sum()
['total runs'].reset index()
total_score_df
      match id
                 inning
                          total runs
0
              1
                      1
                                 207
                      2
1
              1
                                 172
2
              2
                      1
                                 184
3
              2
                      2
                                 187
4
              3
                      1
                                 183
                     . . .
                                 . . .
         11413
                      2
                                 170
1523
1524
         11414
                      1
                                 155
                      2
1525
         11414
                                 162
                      1
1526
         11415
                                 152
                      2
                                 157
1527
         11415
```

## [1528 rows x 3 columns]

total\_score\_df=total\_score\_df['inning']==1]
total\_score\_df

	match_id	inning	total_runs
0	1	1	207
2	2	1	184
4	3	1	183
6	4	1	163
8	5	1	157
1518	11347	1	143
1520	11412	1	136
1522	11413	1	171
1524	11414	1	155
1526	11415	1	152

## [756 rows x 3 columns]

match\_df=match.merge(total\_score\_df[['match\_id','total\_runs']],left\_on
='id',right\_on='match\_id')
match\_df

	id	season	city	date	
team1	\				
0	7894	2018	Mumbai	07/04/18	Mumbai
India					
1	7895	2018	Mohali	08/04/18	Delhi
Dared					
2	7896	2018	Kolkata	08/04/18	Royal Challengers
Banga	lore				
3	7897	2018	Hyderabad	09/04/18	Rajasthan
Royal:	S				
4	7898	2018	Chennai	10/04/18	Kolkata Knight
Rider	S				
113	11346	2019	Mohali	05/05/19	Chennai Super
Kings					
114	11347	2019	Mumbai	05/05/19	Kolkata Knight
Rider	S				J
115	11412	2019	Chennai	07/05/19	Chennai Super
Kings					
116	11414	2019	Visakhapatnam	10/05/19	Delhi
Capita	als		•		
•	11415	2019	Hyderabad	12/05/19	Mumbai
India	_		,	-,,	

result	team2	toss	s_winner to	oss_decision	
0	Chennai Super Kings	Chennai Supe	er Kings	field	
normal 1	Kings XI Punjab	Kings X	I Punjab	field	
normal 2 K	olkata Knight Riders	Kolkata Knight	t Riders	field	
normal 3	Sunrisers Hyderabad	Sunrisers Hy	yderabad	field	
normal 4	Chennai Super Kings	Chennai Supe	er Kings	field	
normal		,			
113 normal	Kings XI Punjab	Kings XI	I Punjab	field	
114	Mumbai Indians	Mumbai	Indians	field	
normal	Mumbai Indians	Chennai Supe	er Kings	bat	
normal	Chennai Super Kings	Chennai Supe	er Kings	field	
normal 117	Chennai Super Kings	Mumbai	Indians	bat	
normal					
4	l applied	winner wi	in by runs	win by wicke	+c \
0		Super Kings	0	win_by_wicke	1
1	0 Kings	XI Punjab	0		6
2	0 Kolkata Kni		0		4
3		Hyderabad Super Kings	0 0		9 5
4	o chemiai s	uper Kings			
113	0 Kings	XI Punjab	0		6
114		ai Indians	0		9
115		ai Indians	0		6
116 117		Super Kings Dai Indians	0 1		6 0
11/	e Mullip	ial lilulalis	1		U
	ayer_of_match				venue
0	DJ Bravo			Wankhede St	adium
1	KL Rahul Punjab	Cricket Associ	iation IS E	Bindra Stadium	1,
2	SP Narine			Eden Ga	rdens
3	S Dhawan	Rajiv Gandhi	Internatio	onal Stadium,	Uppal
4	SW Billings	MA	Chidambara	am Stadium, Ch	epauk

113	KL Rahul			IS Bindra	Stadium
114	HH Pandya			Wankhede	Stadium
115	AS Yadav		M. <i>A</i>	A. Chidambaram	Stadium
116 F	du Plessis			ACA - VDCA	Stadium
117	JJ Bumrah		Raiiv Gandhi	Intl. Cricket	
117	33 Dami an		najiv canani	THE CITCHE	Staaram
		npire1	umpire2		
umpire3	Chris Ga	ffaney	A Nanda Kishore	Ani	l
Chaudhar 1		Γucker	K Ananthapadmanabhan		Nitin
Menon 2	C Shamsh	nuddin	A.D Deshmukh		S
Ravi 3	Nigel	Llong	Vineet Kulkarni		0
Nandan 4	J			A No.	
4 Kishore	Anil Cha	uunar y	Chris Gaffaney	A Na	IIua
113 KN Oxenford	Ananthapadmar	nabhan	C Shamshuddin	Bru	ce
114 Ravi	Nanda K	ishore	0 Nandan		S
115	Nigel	Llong	Nitin Menon		Ian
Gould 116	Sundarar	n Ravi	Bruce Oxenford	Chettithody	
Shamshud 117		Menon	Ian Gould		Nigel
Llong					
mat 0 1 2 3 4	ch_id total 7894 7895 7896 7897 7898	runs 169 172 182 133 207			
113 114 115 116	11346 11347 11412 11414 11415	172 143 136 155 152			

```
[118 rows x 20 columns]
#to find how many teams
match df['team1'].unique()
array(['Mumbai Indians', 'Delhi Daredevils',
       'Royal Challengers Bangalore', 'Rajasthan Royals',
       'Kolkata Knight Riders', 'Kings XI Punjab', 'Chennai Super
Kings',
       'Sunrisers Hyderabad', 'Delhi Capitals'], dtype=object)
team=['Sunrisers Hyderabad', 'Mumbai Indians', 'Royal Challengers
Bangalore', 'Kolkata Knight Riders', 'Kings XI Punjab'
       'Chennai Super Kings', 'Rajasthan Royals', 'Delhi
Capitals','Gujarat Titans','Lucknow Super Giants']
match df['team1']=match df['team1'].str.replace('Delhi
Daredevils','Delhi Capitals')
match df['team2']=match df['team2'].str.replace('Delhi
Daredevils','Delhi Capitals')
match_df['team1']=match df['team1'].str.replace('Deccan
Chargers', 'Sunrisers Hyderabad')
match df['team2']=match df['team2'].str.replace('Deccan
Chargers','Sunrisers Hyderabad')
match_df['team1']=match_df['team1'].str.replace('Pune
Warriors', 'Lucknow Super Giants')
match_df['team2']=match_df['team2'].str.replace('Pune
Warriors', 'Lucknow Super Giants')
match df['team1']=match df['team1'].str.replace('Gujarat
Lions', 'Gujarat Titans')
match_df['team2']=match_df['team2'].str.replace('Gujarat
Lions, 'Gujarat Titans')
match_df=match_df[match_df['team1'].isin(team)]
match df=match df[match df['team2'].isin(team)]
match df=match df[match df['team1'].isin(team)]
match df=match df[match df['team2'].isin(team)]
```

#duckworth a match_df=mat match_df		ethod tch_df['dl_ap <sub> </sub>				
id	season	city	date			
team1 \ 0 7894 Indians	2018	Mumbai	07/04/18		Mumbai	
1 7895	2018	Mohali	08/04/18		Delhi	
Capitals 2 7896 Bangalore	2018	Kolkata	08/04/18	Royal	Challengers	
3 7897	2018	Hyderabad	09/04/18		Rajasthan	
Royals 4 7898 Riders	2018	Chennai	10/04/18		Kolkata Knight	
113 11346	2019	Mohali	05/05/19		Chennai Super	
Kings 114 11347	2019	Mumbai	05/05/19		Kolkata Knight	
Riders 115 11412	2019	Chennai	07/05/19		Chennai Super	
Kings 116 11414	2019	Visakhapatnam	10/05/19		Delhi	
Capitals 117 11415 Indians	2019	Hyderabad	12/05/19		Mumbai	
		team2	toss_w	inner	toss_decision	
result \ 0 Chenn	nai Super	Kings Cher	nnai Super	Kings	field	
normal 1 K	ings XI		Kings XI P		field	
normal	tings /ti		Kings XI I	anjab	12000	
2 Kolkata normal	Knight	Riders Kolka	ta Knight R	iders	field	
3 Sunri	sers Hyd	erabad Sun	risers Hyde	rabad	field	
normal 4 Chenn	nai Super	Kings Che	nnai Super	Kings	field	
normal						
	( ) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		VT D			
113 K normal	(ings XI	Punjab	Kings XI P	unjab	field	
114 normal	Mumbai I	ndians	Mumbai In	dians	field	
115	Mumbai I	ndians Che	nnai Super	Kings	bat	
normal 116 Chenn	nai Super	Kings Cher	nnai Super	Kings	field	

normal			
117 normal	Chennai Super Kings	Mumbai Indians	bat
d	l_applied v	winner win_by_runs	win_by_wickets \
0	0 Chennai Super		1
1 2	0 Kings XI I 0 Kolkata Knight I		6 4
3	0 Sunrisers Hyde	erabad 0	9
4	0 Chennai Super	Kings 0	5
113	0 Kings XI I	Punjab 0	6
114	0 Mumbai I	ndians 0	9
115 116	0 Mumbai I 0 Chennai Super		6 6
117	0 Mumbai I		0
_	ayer_of_match		venue
0	DJ Bravo		Wankhede Stadium
1	KL Rahul Punjab Cric	ket Association IS Bi	Indra Stadium,
2	SP Narine		Eden Gardens
3	S Dhawan Raj:	iv Gandhi Internatior	nal Stadium, Uppal
4	SW Billings	MA Chidambaran	n Stadium, Chepauk
113	KL Rahul		IS Bindra Stadium
114	HH Pandya		Wankhede Stadium
115	AS Yadav	M. A. Ch	nidambaram Stadium
116	F du Plessis		ACA-VDCA Stadium
117	JJ Bumrah	Rajiv Gandhi Intl	. Cricket Stadium
	umpi pol	umnirol	
umpire	umpirel 3 \	umpire2	
0 Chaudh	Chris Gaffaney	A Nanda Kishore	Anil
Chaudh 1	-	anthapadmanabhan	Nitin
Menon 2	C Shamshuddin	A.D Deshmukh	S
Ravi 3	Nigel Llong	Vineet Kulkarni	0

```
Nandan
            Anil Chaudhary
                                    Chris Gaffaney
                                                             A Nanda
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Kishore
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     KN Ananthapadmanabhan
                                     C Shamshuddin
                                                               Bruce
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             Nanda Kishore
                                          0 Nandan
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Ravi
115
                Nigel Llong
                                       Nitin Menon
                                                                    Ian
Gould
                                    Bruce Oxenford Chettithody
116
              Sundaram Ravi
Shamshuddin
                Nitin Menon
                                         Ian Gould
117
                                                                  Nigel
Llong
     match id
                total runs
         7894
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3
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4
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113
        11346
114
        11347
                       143
115
        11412
                       136
116
        11414
                       155
117
        11415
                       152
[115 rows x 20 columns]
match df=match df[['match id','city','winner','total runs']]
match_df
     match id
                         city
                                               winner
                                                        total runs
0
         7894
                       Mumbai
                                  Chennai Super Kings
                                                                169
1
         7895
                       Mohali
                                      Kings XI Punjab
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2
                               Kolkata Knight Riders
         7896
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3
                    Hyderabad
                                  Sunrisers Hyderabad
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                                                                133
4
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                      Chennai
                                  Chennai Super Kings
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113
        11346
                       Mohali
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                       Mumbai
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                                                                143
115
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                      Chennai
                                       Mumbai Indians
                                                                136
116
        11414
               Visakhapatnam
                                  Chennai Super Kings
                                                                155
                                       Mumbai Indians
117
        11415
                    Hyderabad
                                                                152
[115 rows x 4 columns]
```

delive delive	- <del>-</del>	h_df.merge(	delivery,on='match_id'	)		
	match_id	city	winner	total_	_runs_x	inning
0	7894	Mumbai	Chennai Super Kings		169	1
1	7894	Mumbai	Chennai Super Kings		169	1
2	7894	Mumbai	Chennai Super Kings		169	1
3	7894	Mumbai	Chennai Super Kings		169	1
4	7894	Mumbai	Chennai Super Kings		169	1
27783	11415	Hyderabad	Mumbai Indians		152	2
27784	11415	Hyderabad	Mumbai Indians		152	2
27785	11415	Hyderabad	Mumbai Indians		152	2
27786	11415	Hyderabad	Mumbai Indians		152	2
27787	11415	Hyderabad	Mumbai Indians		152	2
		·				
\	ba	tting_team	bowling_team	over	ball	batsman
0	Mumb	ai Indians	Chennai Super Kings	1	1 R	G Sharma
1	Mumb	ai Indians	Chennai Super Kings	1	2 R	G Sharma
2	Mumb	ai Indians	Chennai Super Kings	1	3 R	G Sharma
3	Mumb	ai Indians	Chennai Super Kings	1	4 R	G Sharma
4	Mumb	ai Indians	Chennai Super Kings	1	5 R	G Sharma
 27783	Chennai S	uper Kings	Mumbai Indians	20	2 R/	A Jadeja
 27784		uper Kings	Mumbai Indians	20		R Watson
27785		uper Kings	Mumbai Indians	20		R Watson
			Mumbai Indians			N Thakur
27786		uper Kings		20		
27787	Chennai S	uper Kings	Mumbai Indians	20	6 SI	N Thakur

	bye_runs le	gbye runs	noball_r	runs	penalty_	runs	batsman_	runs	; \
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27784	0	0		0		0		2	
27785	0	0		0		0		1	L
27786	0	0		0		0			
27787	0	0		0		0		6	)
	extra_runs	total_rur	ns v pla	aver d	ismissed	dis	nissal ki	.nd	
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3	0		4		NaN		N	laN	
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4	0		1		NaN		N	laN	
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27783	0		1		NaN		N	laN	
NaN									
27784	0		2		NaN		N	laN	
NaN									
27785	0		1	S	R Watson		run o	ut	KH
Pandya	ì								
27786	0		2		NaN		N	laN	
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27787	0		0	S	N Thakur		l	bw	
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	3 rows x 24	columnel							
[27700	) 10W3 X 24	co cumii 3 j							
delive delive	ery_df=deliv ery_df	ery_df[deli	ivery_df	['inni	.ng']== <mark>2</mark> ]				
	match_id	city			winner	total_	_runs_x	inni	ng
\									-
122	7894	Mumbai	Chennai	Super	Kings		169		2
122	7004	Mumbai	Channai	Cupar	Vinas		160		2
123	7894	Mumbai	Chennai	Super	KINGS		169		2

124	7894	Mumbai	Chenna	i Super I	Kings		169	2
125	7894	Mumbai	Chenna	i Super I	Kings		169	2
126	7894	Mumbai	Chenna	i Super I	Kings		169	2
27783	11415	Hyderabad	Mı	umbai In	dians		152	2
27784	11415	Hyderabad	Mı	umbai In	dians		152	2
27785	11415	Hyderabad	Mı	umbai In	dians		152	2
27786	11415	Hyderabad	Mı	umbai In	dians		152	2
27787	11415	Hyderabad	Mı	umbai In	dians		152	2
\		tting_team		ing_team	over	ball	batsman	
122	Chennai S	uper Kings	Mumbai	Indians	1	1	SR Watson	
123	Chennai S	uper Kings	Mumbai	Indians	1	2	SR Watson	
124	Chennai S	uper Kings	Mumbai	Indians	1	3	AT Rayudu	
125	Chennai S	uper Kings	Mumbai	Indians	1	4	SR Watson	
126	Chennai S	uper Kings	Mumbai	Indians	1	5	AT Rayudu	
27783	Chennai S	uper Kings	Mumbai	Indians	20	2	RA Jadeja	
27784	Chennai S	uper Kings	Mumbai	Indians	20	3	SR Watson	
27785	Chennai S	uper Kings	Mumbai	Indians	20	4	SR Watson	
27786	Chennai S	uper Kings	Mumbai	Indians	20	5	SN Thakur	
27787	Chennai S	uper Kings	Mumbai	Indians	20	6	SN Thakur	
122 123 124 125	bye_runs l 0 0 0	egbye_runs 0 0 0 0	noball <sub>_</sub>	_runs po 0 0 0 0	enalty_	runs 0 0 0	batsman_run	s \ 0 1 1
126	0	0		0		0		0

27783 27784 27785 27786 27787	0 0 0 0 0	0 0 0 0 0	 0 0 0 0 0	0 0 0 0 0		1 2 1 2 0			
e fielder	xtra_runs †	total_runs_y	player_dismisse	d dismissal	_kind				
122	0	Θ	Na	N	NaN				
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124	0	1	Na	N	NaN				
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126	0	0	Na	N	NaN				
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27786	0	2	Na	N	NaN				
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27787	0	Θ	SN Thaku	r	lbw				
NaN									
[13565 r	ows x 24 co	lumns]							
delivery	_df.shape								
(13565,	24)								
['total_	<pre>delivery_df['current_score']=delivery_df.groupby('match_id').cumsum() ['total_runs_y'] delivery_df['current_score']</pre>								
C:\Users\Admin\AppData\Local\Temp\ipykernel_8420\3255284664.py:1: SettingWithCopyWarning: A value is trying to be set on a copy of a slice from a DataFrame. Try using .loc[row_indexer,col_indexer] = value instead									
https://			tion: -docs/stable/use	r_guide/inde	xing.h	ntml#			

```
delivery df['current score']=delivery df.groupby('match id').cumsum()
['total runs y']
122
123
           1
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125
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27783
         152
27784
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27785
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27786
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Name: current score, Length: 13565, dtype: int64
delivery df
       match id
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/
122
           7894
                             Chennai Super Kings
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123
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27783
          11415
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27784
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27785
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27786
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27787
                 Hyderabad
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          11415
                                                             152
                               bowling team
              batting team
                                              over
                                                    ball
                                                            batsman
122
       Chennai Super Kings
                             Mumbai Indians
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                                                          SR Watson
123
       Chennai Super Kings
                             Mumbai Indians
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124
       Chennai Super Kings
                             Mumbai Indians
                                                 1
                                                          AT Rayudu
```

125	Chennai Super	Kings Mumbai	Indians	1	4 SR	Watson	
126	Chennai Super	Kings Mumbai	Indians	1	5 AT	Rayudu	
27783	Chennai Super	Kings Mumbai	Indians	20	2 RA	Jadeja	
27784	Chennai Super	Kings Mumbai	Indians	20	3 SR	Watson	
27785	Chennai Super	Kings Mumbai	Indians	20	4 SR	Watson	
27786	Chennai Super	Kings Mumbai	Indians	20	5 SN	Thakur	
27787	Chennai Super	Kings Mumbai	Indians	20	6 SN	Thakur	
	legbye_runs no	hall runs nen:	alty runs	batsman	runc	extra r	ıınc
122	<del>-</del>	0 0	0	bacsillari_	0	extra_r	
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126	0	0	0		0		0
27783	0	Θ	0		1		0
27784	0	0	0		2		0
27785	0	0	0		1		0
27786	0	0	0		2		0
27787	0	0	0		0		0
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122	total_runs_y 0	player_dismiss	sed dismi: NaN	ssal_kind NaN	f	ielder NaN	\
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```
27785
                             SR Watson
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       current score
122
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27783
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27786
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27787
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[13565 rows x 25 columns]
delivery_df['runs_left']=delivery_df['total runs x']-
delivery df['current score']
delivery df
C:\Users\Admin\AppData\Local\Temp\ipykernel 8420\1099504436.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead
See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
  delivery df['runs left']=delivery df['total runs x']-
delivery df['current score']
       match id
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\
122
           7894
                    Mumbai Chennai Super Kings
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126
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                    Mumbai Chennai Super Kings
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27783
          11415
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27784
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                                                                       2
```

27785	11415	Hyde	erabad	Mu	umbai In	dians		152	2
27786	11415	. Hyde	erabad	Mı	umbai In	dians		152	2
27787	11415	Hyde	erabad	Mı	umbai In	dians		152	2
\		atting	_		ing_team		ball	batsman	
122	Chennai	Super	Kings	Mumbai	Indians	1	1 9	R Watson	
123	Chennai	Super	Kings	Mumbai	Indians	1	2 9	R Watson	
124	Chennai	Super	Kings	Mumbai	Indians	1	3 A	T Rayudu	
125	Chennai	Super	Kings	Mumbai	Indians	1	4 9	R Watson	
126	Chennai	Super	Kings	Mumbai	Indians	1	5 A	T Rayudu	
27783	Chennai	Super	Kings	Mumbai	Indians	20	2 F	A Jadeja	
27784	Chennai	Super	Kings	Mumbai	Indians	20	3 9	R Watson	
27785	Chennai	Super	Kings	Mumbai	Indians	20	4 9	R Watson	
27786	Chennai	Super	Kings	Mumbai	Indians	20	5 5	N Thakur	
27787	Chennai	Super	Kings	Mumbai	Indians	20	6 9	N Thakur	
								_	
\	noball_ru	ıns per	nalty_r	uns ba <sup>1</sup>	tsman_ru	ns ext	ra_runs	total_ru	ins_y
122		0		0		0	0		0
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125		0		0		1	Θ		1
126		0		0		0	0		0
27783		0		0		1	0		1
27784		0		0		2	0		2
27785		0		Θ		1	0		1
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27786	Θ	0	2	0	2
27787	0	0	0	0	0
-	ayer_dismissed o	dismissal_kind	fielder	current_score	
runs_left 122	NaN	NaN	NaN	0	
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124 167	NaN	NaN	NaN	2	
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166	Hait	itait	Hart	3	
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166					
27783	NaN	NaN	NaN	152	
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27784	NaN	NaN	NaN	154	
-2					
27785	SR Watson	run out	KH Pandya	155	
-3 27786	NaN	NaN	NaN	157	
-5	IVAIV	IVAIV	Nan	137	
27787	SN Thakur	lbw	NaN	157	
- 5					
[13565 ro	ws x 26 columns]				
delivery	df['balls left']:	=126-			
	_df['over']* <mark>6</mark> +de		1)		
delivery_	df[ˈballs_left']	<i>,</i>	- /		
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	thCopyWarning:	at (Temp (ThykeTi	et_0420\30.	5000/41.py.1.	
	s trying to be se	et on a copy of	a slice fr	om a DataFrame.	
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C +					
	caveats in the doc candas.pydata.org,		hla/usar a	uide/indevina h	tm1#
	-a-view-versus-a		bre/user_g	urue/ indexing.n	CIII C#
	y df['balls left				
(delivery	_df['over']*6+de	livery_df['ball'	])		
122	119				
	118				
	117				

125 126 27783 27784 27785 27786	116 115  4 3 2			
27787	Θ	Lenath: 1	3565, dtype: int64	
delive	<del>_</del>	, Length. I	3303, dtype. Into-	
	match_id	city	winner total_runs_x i	nning
\ 122	7894	Mumbai	Chennai Super Kings 169	2
123	7894	Mumbai	Chennai Super Kings 169	2
124	7894	Mumbai	Chennai Super Kings 169	2
125	7894	Mumbai	Chennai Super Kings 169	2
126	7894	Mumbai	Chennai Super Kings 169	2
27783	11415	Hyderabad	Mumbai Indians 152	2
27784	11415	Hyderabad	Mumbai Indians 152	2
27785	11415	Hyderabad	Mumbai Indians 152	2
27786	11415	Hyderabad	Mumbai Indians 152	2
27787	11415	Hyderabad	Mumbai Indians 152	2
	ba	tting_team	bowling_team over ball batsma	١
\ 122	Chennai S	uper Kings	Mumbai Indians 1 1 SR Watson	١
123	Chennai S	uper Kings	Mumbai Indians 1 2 SR Watson	ı
124	Chennai S	uper Kings	Mumbai Indians 1 3 AT Rayud	J
125	Chennai S	uper Kings	Mumbai Indians 1 4 SR Watson	ı
126	Chennai S	uper Kings	Mumbai Indians 1 5 AT Rayud	J

27783	Chennai	Super	Kings	Mumbai	Indians	20	2	RA	Jadeja	
27784	Chennai	Super	Kings	Mumbai	Indians	20	3	SR	Watson	
27785	Chennai	Super	Kings	Mumbai	Indians	20	4	SR	Watson	
27786	Chennai	Super	Kings	Mumbai	Indians	20	5	SN	Thakur	
27787	Chennai	Super	Kings	Mumbai	Indians	20	6	SN	Thakur	
			atsman_	runs e	xtra_runs	tota	al_runs_	_y		
	_dismisse									
122		0		0	0			0		
NaN		_			_					
123		0		1	0			1		
NaN										
124		0		1	0			1		
NaN										
125		0		1	0			1		
NaN										
126		0		0	0			0		
NaN										
27783		0		1	0			1		
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27784		0		2	0			2		
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27785		0		1	0			1		SR
Watson										
27786		0		2	0			2		
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27787		0		0	0			0		SN
Thakur										
	dismissa	al kind	d fi	elder	current_s	core	runs le	eft	balls	left
		_			_		_			
122		Nal	V	NaN		0		169		119
123		Nal	V	NaN		1	•	168		118
124		Nal	V	NaN		2		167		117
						_				
125		Nal	V	NaN		3		166		116
100						_				
126		Nal	V	NaN		3		166		115
			•							
27783		Nal	\I	NaN		152		0		4
21103		ival	V	IVAIV		132		U		4

27784	NaN	NaN	154	-2	3
27785	run out	KH Pandya	155	-3	2
27786	NaN	NaN	157	-5	1
27787	lbw	NaN	157	-5	0
[10565		-			
[13565 rows x	2/ colum	ns]			

delivery\_df['player\_dismissed']=delivery\_df['player\_dismissed'].fillna
('0')

delivery\_df['player\_dismissed']=delivery\_df['player\_dismissed'].apply(
lambda x:x if x =='0' else '1')

delivery\_df['player\_dismissed']=delivery\_df['player\_dismissed'].astype
('int')

C:\Users\Admin\AppData\Local\Temp\ipykernel\_8420\3549811476.py:1:
SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame. Try using .loc[row indexer,col indexer] = value instead

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy

delivery\_df['player\_dismissed']=delivery\_df['player\_dismissed'].fillna
('0')

C:\Users\Admin\AppData\Local\Temp\ipykernel\_8420\3549811476.py:2:
SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame. Try using .loc[row indexer,col indexer] = value instead

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy

delivery\_df['player\_dismissed']=delivery\_df['player\_dismissed'].apply(
lambda x:x if x == '0' else '1')

C:\Users\Admin\AppData\Local\Temp\ipykernel\_8420\3549811476.py:3:
SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame. Try using .loc[row indexer,col indexer] = value instead

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#
returning-a-view-versus-a-copy

```
delivery df['player dismissed']=delivery df['player dismissed'].astype
('int')
wickets=delivery df.groupby('match id').cumsum()
['player dismissed'].values
delivery df['wickets']=10-wickets
delivery df.head()
C:\Users\Admin\AppData\Local\Temp\ipykernel 8420\1442848416.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead
See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user guide/indexing.html#
returning-a-view-versus-a-copy
  delivery df['wickets']=10-wickets
     match id
                                            total runs x
                                                          inning
                 city
                                    winner
122
               Mumbai Chennai Super Kings
         7894
                                                     169
                                                                2
                                                                2
123
         7894
               Mumbai
                       Chennai Super Kings
                                                     169
                                                                2
124
         7894
               Mumbai
                       Chennai Super Kings
                                                      169
                                                                2
125
         7894
              Mumbai
                       Chennai Super Kings
                                                     169
126
         7894
              Mumbai Chennai Super Kings
                                                     169
                                                                2
            batting team
                            bowling team over
                                                ball
batsman
    Chennai Super Kings
122
                          Mumbai Indians
                                             1
                                                   1 SR Watson ...
123
    Chennai Super Kings
                          Mumbai Indians
                                             1
                                                   2
                                                      SR Watson
124 Chennai Super Kings
                          Mumbai Indians
                                                      AT Rayudu
125 Chennai Super Kings
                          Mumbai Indians
                                                   4
                                                      SR Watson
                                             1
126 Chennai Super Kings
                          Mumbai Indians
                                             1
                                                   5 AT Rayudu ...
    batsman runs extra runs total runs y
                                           player dismissed
dismissal kind \
122
                          0
                                        0
                                                          0
NaN
123
               1
                          0
                                        1
                                                          0
NaN
124
               1
                          0
                                                          0
NaN
125
                          0
                                                          0
NaN
126
               0
                                        0
                                                          0
NaN
```

123       NaN       1       168       1         124       NaN       2       167       1         125       NaN       3       166       1	eft wickets 119 10 118 10 117 10 116 10 115 10
120 11011	10
[5 rows x 28 columns]	
<pre>delivery_df.tail()</pre>	
match_id city winner tota 27783 11415 Hyderabad Mumbai Indians 27784 11415 Hyderabad Mumbai Indians 27785 11415 Hyderabad Mumbai Indians 27786 11415 Hyderabad Mumbai Indians 27787 11415 Hyderabad Mumbai Indians	al_runs_x inning \ 152
batting_team bowling_team over	r ball batsman
Changai Cunan Kinna Mumbai Tadiana 20	2 04 3-4-4-
27783 Chennai Super Kings Mumbai Indians 20	9 2 RA Jadeja
27784 Chennai Super Kings Mumbai Indians 20	3 SR Watson
27785 Chennai Super Kings Mumbai Indians 20	9 4 SR Watson
27786 Chennai Super Kings Mumbai Indians 20	5 SN Thakur
27787 Chennai Super Kings Mumbai Indians 20	6 SN Thakur
<pre>batsman_runs extra_runs total_runs_y pla</pre>	aver dismissed
dismissal_kind \	
27783 1 0 1 NaN	0
27784 2 0 2 NaN	0
27785 1 0 1	1
run out	
27786 2 0 2 NaN	0
27787 0 0 0	1
lbw	
——————————————————————————————————————	ls_left wickets
27783 NaN 152 0	4 5
27784 NaN 154 -2 27785 KH Pandya 155 -3	3 5 2 4
27786 NaN 157 -5	1 4
27787 NaN 157 -5	0 3

```
[5 rows x 28 columns]
#crr=runs/overs
delivery_df['crr']=(delivery_df['current score']*6)/(120-
delivery df['balls left'])
C:\Users\Admin\AppData\Local\Temp\ipykernel 8420\1733835164.py:3:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead
See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user guide/indexing.html#
returning-a-view-versus-a-copy
  delivery_df['crr']=(delivery df['current score']*6)/(120-
delivery df['balls left'])
delivery df['rrr']=(delivery df['runs left']*6)/delivery df['balls lef
t'1
C:\Users\Admin\AppData\Local\Temp\ipykernel 8420\3492980221.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead
See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user guide/indexing.html#
returning-a-view-versus-a-copy
delivery df['rrr']=(delivery df['runs left']*6)/delivery df['balls lef
t']
delivery df
                                         winner total runs x inning
       match id
                      city
122
           7894
                    Mumbai Chennai Super Kings
                                                                     2
                                                           169
123
           7894
                                                                     2
                    Mumbai Chennai Super Kings
                                                           169
124
           7894
                                                           169
                                                                     2
                    Mumbai Chennai Super Kings
                                                                     2
125
           7894
                    Mumbai Chennai Super Kings
                                                           169
           7894
                                                                     2
126
                    Mumbai Chennai Super Kings
                                                           169
```

27783	11415	Hyde	rabad	Mι	umbai	Ind	ians		152		2
27784	11415	Hyde	rabad	Mu	umbai	Ind	ians		152		2
27785	11415	Hyde	rabad	Mı	umbai	Ind:	ians		152		2
27786	11415	Hyde	rabad	Mu	umbai	Ind:	ians		152		2
27787	11415	Hyde	rabad	Mı	umbai	Ind	ians		152		2
		-									
\	b	atting	_team	bowli	ing_te	am	over l	oall	bat	sman	
122	Chennai	Super	Kings	Mumbai	India	ns	1	1	SR Wa	tson	
123	Chennai	Super	Kings	Mumbai	India	ns	1	2	SR Wa	tson	
124	Chennai	Super	Kings	Mumbai	India	ns	1	3	AT Ra	yudu	
125	Chennai	Super	Kings	Mumbai	India	ns	1	4	SR Wa	tson	
126	Chennai	Super	Kings	Mumbai	India	ns	1	5	AT Ra	yudu	
27783	Chennai	Super	Kings	Mumbai	India	ns	20	2	RA Ja	deja	
27784	Chennai	Super	Kings	Mumbai	India	ns	20	3	SR Wa	tson	
27785	Chennai	Super	Kings	Mumbai	India	ns	20	4	SR Wa	tson	
27786	Chennai		_	Mumbai	India	ns	20	5	SN Th	akur	
27787	Chennai	·	J	Mumbai	India	ns	20	6	SN Th	akur	
		- up - :	<b>y</b> -								
	total_run t score	s_y pl \	ayer_d	ismissed	dis dis	mis	sal_kind	d ·	fielde	r	
122	_50010	0		(	9		Nal	V	Na	N	
123		1		(	9		Nal	V	Na	N	
1 124		1		(	9		Nal	V	Na	N	
2 125		1		(	9		Nal	V	Na	N	
3 126		0			9		Nai		Na		
3		Ū					1131				

```
27783
                                   0
                                                  NaN
                                                              NaN
152
27784
                 2
                                   0
                                                  NaN
                                                              NaN
154
27785
                                              run out
                                                       KH Pandya
155
27786
                                                  NaN
                                                              NaN
157
27787
                                                  lbw
                                                              NaN
157
                  balls left wickets
       runs left
                                              crr
                                                          rrr
                                                    8.521008
122
             169
                          119
                                    10
                                        0.000000
123
             168
                          118
                                    10
                                        3.000000
                                                    8.542373
124
             167
                          117
                                    10
                                        4.000000
                                                    8.564103
125
             166
                          116
                                    10
                                        4.500000
                                                    8.586207
126
             166
                          115
                                    10
                                        3.600000
                                                    8.660870
. . .
                                    . . .
27783
               0
                            4
                                     5
                                        7.862069
                                                    0.000000
                            3
              - 2
                                        7.897436
                                                   -4.000000
27784
                                     5
                            2
              -3
                                                   -9.000000
27785
                                     4
                                        7.881356
                                        7.915966 -30.000000
                            1
27786
              - 5
                                     4
              -5
                                     3
27787
                            0
                                        7.850000
                                                        -inf
[13565 rows x 30 columns]
def result(row):
    return 1 if row['batting team'] == row['winner'] else 0
delivery df['result']=delivery df.apply(result,axis=1)
delivery df
C:\Users\Admin\AppData\Local\Temp\ipykernel 8420\1276910391.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row indexer,col indexer] = value instead
See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
  delivery df['result']=delivery df.apply(result,axis=1)
       match id
                       city
                                           winner total runs x
                                                                 innina
/
122
           7894
                     Mumbai Chennai Super Kings
                                                            169
                                                                       2
123
           7894
                     Mumbai Chennai Super Kings
                                                            169
                                                                       2
                     Mumbai Chennai Super Kings
124
                                                                       2
           7894
                                                            169
125
           7894
                     Mumbai Chennai Super Kings
                                                            169
                                                                       2
```

126	7894	Mumbai	Chenna	i Super K	ings		169	2
27783	11415	Hyderabad	Mu	umbai Ind	ians		152	2
27784	11415	Hyderabad	Mι	umbai Ind	ians		152	2
27785	11415	Hyderabad	Mı	umbai Ind	ians		152	2
27786	11415	Hyderabad	Mı	umbai Ind	ians		152	2
27787	11415	Hyderabad	Mı	umbai Ind	ians		152	2
	ba	tting_team	bowli	ing_team	over	ball	batsman	
122	Chennai S	Super Kings	Mumbai	Indians	1	1	SR Watson	
123	Chennai S	uper Kings	Mumbai	Indians	1	2	SR Watson	
124	Chennai S	uper Kings	Mumbai	Indians	1	3	AT Rayudu	
125	Chennai S	uper Kings	Mumbai	Indians	1	4	SR Watson	
126	Chennai S	uper Kings	Mumbai	Indians	1	5	AT Rayudu	
27783	Chennai S	Super Kings	Mumbai	Indians	20	2	RA Jadeja	
27784	Chennai S	Super Kings	Mumbai	Indians	20	3	SR Watson	
27785	Chennai S	Super Kings	Mumbai	Indians	20	4	SR Watson	
27786	Chennai S	uper Kings	Mumbai	Indians	20	5	SN Thakur	
27787	Chennai S	Super Kings	Mumbai	Indians	20	6	SN Thakur	
	ساميد ماند	سدناه امدمدنس	المحمد المحمد	نسا فن	ما مام ت		nt	
runs_l	eft \	missed dism	_		elder	curre	nt_score	
122 169		0	N	NaN	NaN		0	
123 168		0	ľ	NaN	NaN		1	
124		0	ı	NaN	NaN		2	
167 125		0	1	NaN	NaN		3	
166								

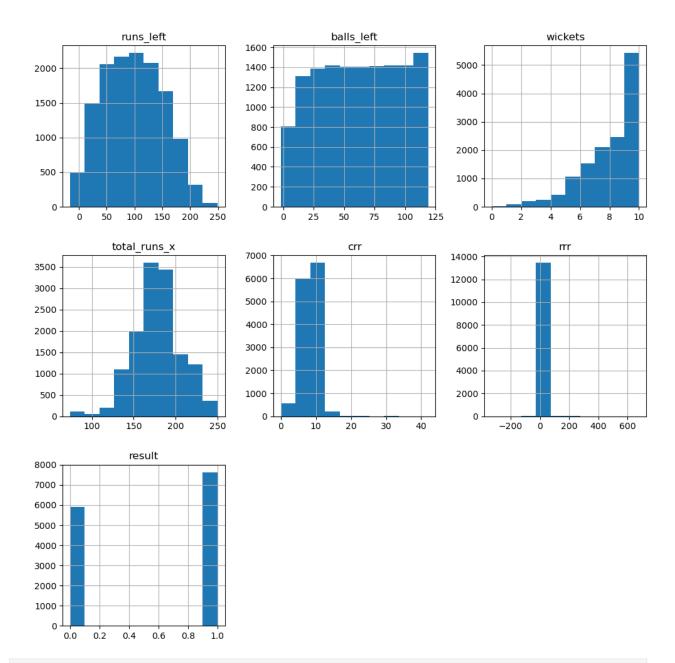
126 166		0	NaN	NaN		3	
27783 0		0	NaN	NaN		152	
27784		0	NaN	NaN		154	
-2 27785 -3		1	run out	KH Pandya		155	
27786 -5		0	NaN	NaN		157	
27787 -5		1	lbw	NaN		157	
122 123 124 125 126  27783 27784 27785 27786 27787	balls_left	wickets 10 10 10 10 5 5 4 4 4 3	3.600000 7.862069 7.897436 7.881356	8.521008 8.542373 8.564103 8.586207 8.660870  0.000000 -4.000000 -9.000000 -9.000000 -inf	result		
[13565	rows x 31 c	olumns]					
final_ ,'ball final_	df=delivery_ s_left','wic df	df[['batt kets','to	ing_team', tal_runs_x	bowling_teat, 'rr','rr	am','city' r','result	,'runs_le	ft'
hall c		ing_team	bowling_	_team	city run	s_left	
balls_ 122 119	left \ Chennai Sup	er Kings	Mumbai Ind	dians M	umbai	169	
123	Chennai Sun	er Kings	Mumbai Ind	dians Mi	umbai	168	

	ŀ	oatting	_team	bowl	ing_team	city	runs_left
balls_	left \		_		_	-	_
122	Chennai	Super	Kings	Mumbai	Indians	Mumbai	169
119							
123	Chennai	Super	Kings	Mumbai	Indians	Mumbai	168
118							
124	Chennai	Super	Kings	Mumbai	Indians	Mumbai	167
117							
125	Chennai	Super	Kings	Mumbai	Indians	Mumbai	166
116							
126	Chennai	Super	Kings	Mumbai	Indians	Mumbai	166
115							
27783	Chennai	Super	Kings	Mumbai	Indians	Hyderabad	Θ
4							

```
27784
      Chennai Super Kings Mumbai Indians Hyderabad
                                                              - 2
3
27785
      Chennai Super Kings Mumbai Indians Hyderabad
                                                              - 3
27786
      Chennai Super Kings Mumbai Indians Hyderabad
                                                              - 5
      Chennai Super Kings Mumbai Indians Hyderabad
                                                              - 5
27787
       wickets
                total_runs_x
                                                   result
                                   crr
                                              rrr
122
            10
                         169
                              0.000000
                                         8.521008
                                                        1
123
            10
                                                        1
                         169
                              3.000000
                                         8.542373
124
            10
                         169
                              4.000000
                                         8.564103
                                                        1
125
            10
                         169
                              4.500000
                                         8.586207
                                                        1
                                                        1
126
            10
                         169
                              3.600000
                                         8.660870
                         . . .
. . .
                                   . . .
           . . .
             5
                         152
                             7.862069
                                         0.000000
27783
                                                        0
27784
             5
                         152
                              7.897436
                                        -4.000000
                                                        0
27785
             4
                         152
                              7.881356
                                        -9.000000
                                                        0
             4
                                                        0
27786
                         152
                              7.915966 -30.000000
             3
27787
                         152
                             7.850000
                                             -inf
[13565 rows x 10 columns]
final df=final df.sample(final df.shape[0])
final df.sample()
                      batting team bowling team
                                                         city
runs left \
15442 Royal Challengers Bangalore Mumbai Indians Bengaluru
46
       balls left wickets total runs x
                                               crr
                                                          rrr
                                                               result
15442
                         6
                                     197 8.882353 15.333333
               18
final df.sample()
                      batting team bowling team city runs left
10793
      Royal Challengers Bangalore Kings XI Punjab Indore
                                                                    61
       balls left wickets total runs x
                                                          result
                                           crr
10793
              104
                        10
                                      93
                                          12.0
                                                3.519231
                                                               1
final df.isnull().sum()
```

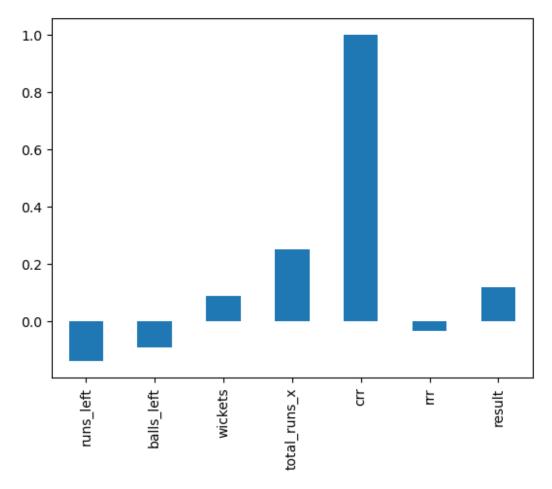
```
0
batting_team
bowling_team
                0
                0
city
runs left
                0
                0
balls left
                0
wickets
                0
total runs x
                0
crr
                1
rrr
result
                0
dtype: int64
final df.dropna(inplace=True)
final df = final df[final df['balls left']!=0]
#final df=pd.set option('mode.use inf as na',True)
final df.isnull().sum()
batting_team
                0
bowling_team
                0
                0
city
                0
runs left
balls_left
                0
                0
wickets
                0
total runs x
crr
                0
                0
rrr
result
                0
dtype: int64
final_df.head()
                      batting team
                                                    bowling team
city \
26568 Royal Challengers Bangalore
                                             Sunrisers Hyderabad
Bengaluru
             Kolkata Knight Riders
                                                  Mumbai Indians
9176
Kolkata
                                                Delhi Daredevils
481
                   Kings XI Punjab
Mohali
                    Mumbai Indians Royal Challengers Bangalore
6973
Bengaluru
             Kolkata Knight Riders
                                     Royal Challengers Bangalore
17881
Bengaluru
       runs_left balls_left wickets total_runs_x
rrr \
26568
              49
                          33
                                                 179 8.965517
8.909091
```

9176	139	51	3	217 6.782609
16.352941 481	9	8	6	172 8.732143
6.750000				
6973	110	74	6	173 8.217391
8.918919				
17881	91	48	7	210 9.916667
11.375000				
resu	ı1 +			
26568	1			
9176	Ō			
481	1			
6973	0			
17881	1			
<pre>final_df.hi plt.show()</pre>	lst(figsiz	e=( <mark>12,12</mark> ))		



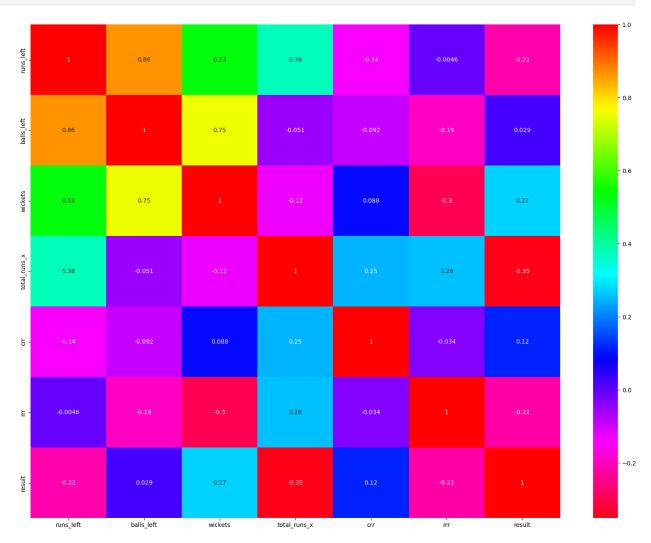
final_df.corr	()				
	runs_left	balls_left	wickets	total_runs_x	crr
\ runs left	1.000000	0.864881	0.530598	0.375743	-0.139437
- balls left	0.864881	1.000000	0.753217	-0.050943	-0.092009
_					
wickets	0.530598	0.753217	1.000000	-0.124865	0.088336
total_runs_x	0.375743	-0.050943	-0.124865	1.000000	0.248675
crr	-0.139437	-0.092009	0.088336	0.248675	1.000000

```
-0.004606
                          -0.194362 -0.296797
                                                    0.260213 -0.033779
rrr
result
              -0.218922
                           0.028681 0.272836
                                                   -0.350882 0.118486
                          result
                   rrr
runs_left
             -0.004606 -0.218922
balls left
             -0.194362
                        0.028681
wickets
             -0.296797
                        0.272836
total runs x 0.260213 -0.350882
             -0.033779
                        0.118486
crr
rrr
              1.000000 -0.222523
             -0.222523
result
                       1.000000
final_df.corr()['crr'].plot(kind='bar')
<AxesSubplot:>
```



```
plt.figure(figsize=(20,15))
corr = final_df.corr()
```

```
sns.heatmap(final_df.corr(), cmap="hsv_r", annot=True)
plt.show()
```

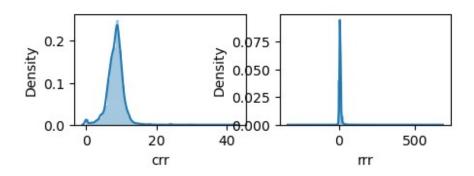


```
features = ['crr','rrr']
plt.subplots(figsize=(5,5))

for i, col in enumerate(features):
   plt.subplot(3,2,i+1)
   sns.distplot(final_df[col])
plt.show()

C:\Users\Admin\anaconda3\lib\site-packages\seaborn\
   distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
   warnings.warn(msg, FutureWarning)
C:\Users\Admin\anaconda3\lib\site-packages\seaborn\
```

distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms). warnings.warn(msg, FutureWarning)



','city	lf=pd.get <sub>.</sub> '']) lf.head()	_dummies(fin	al_df,col	umns=['b	atting_t	eam','bowling_team
	runs_lef	t balls_lef	t wicket	s total	_runs_x	crr
rrr \ 26568	4	9 3	3	7	179	8.965517
8.90909 9176	)1 13	9 5	1	3	217	6.782609
16.3529 481		9	8	6	172	8.732143
6.75000	00					
6973 8.91891	.9	9 7	4	6	173	8.217391
17881	9	1 4	8	7	210	9.916667
11.3750						
Capital		batting_team	_Chennai	Super Ki	ngs bat	ting_team_Delhi
26568	1				0	
0 9176	0				0	
0 481	1				0	
0	1				U	
6973 0	0				0	
17881	1				0	
0						
	batting_	team_Delhi D	aredevils	c	ity_Chen	nai city_Delhi \

```
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       city_Hyderabad city_Indore city_Jaipur city_Kolkata
city_Mohali \
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       city Mumbai
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481
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17881
[5 rows x 36 columns]
x=final df.drop('result',axis=1)
y=final df['result']
x_train,y_train,x_test,y_test=train_test_split(x,y,test_size=0.2,rando
m state=1)
x train.describe()
                        balls left
           runs left
                                           wickets
                                                     total runs x
crr \
count 10819.000000
                      10819.000000
                                      10819.000000
                                                     10819.000000
10819.000000
          97.023570
                          61.660412
                                          7.611517
                                                       178.737591
mean
8.284920
std
                          33,399660
          53.036988
                                          1.988323
                                                        28.602726
2.375081
          -16.000000
                          -2.000000
                                          0.000000
                                                        74.000000
min
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8.451613
```

75%	137.000000	90.000000	9.000000	196.000000
9.508954	1			
max 42.00000	249.000000 90	119.000000	10.000000	250.000000
mean std min 25% 50% 75%	10819.000000 10.855610 14.188550 -330.000000 7.800000 9.439024 11.554374	batting_team_Ch	10819.000 0.186 0.389 0.000 0.000 0.000	0000 5709 0695 0000 0000
max	678.000000		1.000	0000
count mean std min 25% 50% 75% max	oatting_team_De	elhi Capitals 10819.000000 0.076347 0.265565 0.000000 0.000000 0.000000 0.000000 1.000000	batting_team_D	Delhi Daredevils \ 10819.000000 0.033737 0.180560 0.000000 0.000000 0.000000 0.000000 1.000000
ŀ	oatting_team_K	ings XI Punjab	city_Che	ennai
<pre>city_De<sup>1</sup> count</pre>	lhi \	10819.000000	10819.00	00000 10819.000000
mean		0.115815	0.07	74221 0.116092
std		0.320017	0.26	0.320350
min		0.000000	0.00	0.00000
25%		0.000000	0.00	0.00000
50%		0.000000	0.00	0.00000
75%		0.000000	0.00	0.00000
max		1.000000	1.00	1.00000
city Mol	city_Hyderabad nali \	city_Indore	city_Jaipur	city_Kolkata
count 10819.00	10819.000000	10819.000000	10819.000000	10819.000000
mean 0.086330	0.127738	0.030872	0.111933	0.130326

Std         0.333814         0.172978         0.315298         0.336678           0.280863         0.000000         0.000000         0.000000         0.000000         0.000000           25%         0.000000         0.000000         0.000000         0.000000         0.000000           50%         0.000000         0.000000         0.000000         0.000000         0.000000           75%         0.000000         0.000000         0.000000         0.000000         0.000000           0.000000         1.000000         1.000000         1.000000         1.000000         1.000000           0.000000         0.000000         1.000000         1.000000         1.000000         1.000000           0.000000         0.140956         0.055366         0.008966 <th></th> <th></th> <th></th> <th></th> <th></th>					
min		0.333814	0.172978	0.315298	0.336678
25% 0.000000 0.000000 0.000000 0.000000 0.000000	min	0.000000	0.000000	0.000000	0.000000
50% 0.000000 0.000000 0.000000 0.000000 0.000000	25%	0.000000	0.000000	0.000000	0.000000
75% 0.000000 0.000000 0.000000 0.000000 0.000000	50%	0.000000	0.000000	0.000000	0.00000
max         1.000000         1.000000         1.000000         1.000000         1.000000           City_Mumbai         City_Pune         City_Visakhapatnam           count 10819.000000         10819.000000         10819.000000           std         0.140956         0.055366         0.008966           std         0.347992         0.228703         0.094266           min         0.000000         0.000000         0.000000           25%         0.000000         0.000000         0.000000           75%         0.000000         0.000000         0.000000           russ_left         balls_left         wickets         total_russ_x           crr         crr         vickets         total_russ_x           crr         crr         vickets         total_russ_x           crr         count         2705.000000         2705.000000           respect colspan="2">respect colspan="2">colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect colspan="2">respect col		0.000000	0.000000	0.000000	0.000000
City_Mumbai		1.000000	1.000000	1.000000	1.000000
count 10819.000000 10819.000000 10819.000000 mean 0.140956 0.055366 0.008966 std 0.347992 0.228703 0.094266 min 0.000000 0.000000 0.000000 25% 0.000000 0.000000 0.000000 50% 0.000000 0.000000 0.000000 75% 0.000000 1.000000 0.000000 max 1.000000 1.000000 1.000000 [8 rows x 35 columns]  y_train.describe()  runs_left balls_left wickets total_runs_x  crr \ count 2705.000000 2705.000000 2705.000000 2705.000000 mean 98.961922 63.011091 7.649908 178.778558 8.247974 std 52.979869 33.693930 2.007518 28.613112 2.413717 min -12.000000 1.000000 0.000000 74.000000 0.000000 25% 57.000000 34.000000 0.000000 74.000000 0.000000 25% 57.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.0000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 mean 10.811286 0.179298					
y_train.describe()  runs_left balls_left wickets total_runs_x  crr \ count 2705.000000 2705.000000 2705.000000 2705.000000  mean 98.961922 63.011091 7.649908 178.778558 8.247974  std 52.979869 33.693930 2.007518 28.613112 2.413717  min -12.000000 1.000000 0.000000 74.000000 0.000000 25% 57.000000 34.000000 6.000000 161.000000 7.018868 50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494  max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 mean 10.811286	count 10819 mean 0 std 0 min 0 25% 0 50% 0 75% 0	.000000       10819         .140956       0         .347992       0         .000000       0         .000000       0         .000000       0         .000000       0	.000000 .055366 .228703 .000000 .000000 .000000	10819.000000 0.008966 0.094266 0.000000 0.000000 0.000000	
runs_left balls_left wickets total_runs_x  crr \ count 2705.000000 2705.000000 2705.000000 2705.000000 2705.000000 mean 98.961922 63.011091 7.649908 178.778558 8.247974 std 52.979869 33.693930 2.007518 28.613112 2.413717 min -12.000000 1.000000 0.000000 74.000000 0.000000 25% 57.000000 34.000000 6.000000 161.000000 7.018868 50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 mean 10.811286 0.179298	[8 rows x 35	columns]			
crr \ count 2705.000000 2705.000000 2705.000000 2705.000000 2705.000000 2705.000000 2705.000000 2705.000000  mean 98.961922 63.011091 7.649908 178.778558 8.247974 std 52.979869 33.693930 2.007518 28.613112 2.413717 min -12.000000 1.000000 0.000000 74.000000 0.000000 25% 57.000000 34.000000 6.000000 161.000000 7.018868 50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 mean 10.811286 2705.000000 0.179298	y_train.desc	ribe()			
count       2705.000000       2705.000000       2705.000000       2705.000000         mean       98.961922       63.011091       7.649908       178.778558         8.247974       std       52.979869       33.693930       2.007518       28.613112         2.413717       min       -12.000000       1.000000       0.000000       74.000000         25%       57.000000       34.000000       6.000000       161.000000         7.018868       50%       98.000000       63.000000       8.000000       179.000000         8.457143       75%       140.000000       93.000000       9.000000       196.000000         9.506494       max       239.000000       119.000000       10.000000       250.000000         28.000000       2705.000000       2705.000000       0.179298		s_left balls	_left wick	kets total_ru	ns_x
mean       98.961922       63.011091       7.649908       178.778558         8.247974       std       52.979869       33.693930       2.007518       28.613112         2.413717       min       -12.000000       1.000000       0.000000       74.000000         0.000000       57.000000       34.000000       6.000000       161.000000         7.018868       50%       98.000000       63.000000       8.000000       179.000000         8.457143       75%       140.000000       93.000000       9.000000       196.000000         9.506494       max       239.000000       119.000000       10.000000       250.000000         28.000000       rrr       batting_team_Chennai Super Kings \ 2705.000000         mean       10.811286       2705.000000	count 2705.0	900000 2705.00	90000 2705.000	2705.00	9000
std       52.979869       33.693930       2.007518       28.613112         2.413717       min       -12.000000       1.000000       0.000000       74.000000         0.000000       57.000000       34.000000       6.000000       161.000000         7.018868       50%       98.000000       63.000000       8.000000       179.000000         8.457143       75%       140.000000       93.000000       9.000000       196.000000         9.506494       max       239.000000       119.000000       10.000000       250.000000         28.000000       rrr       batting_team_Chennai Super Kings \ 2705.000000         count       2705.000000       0.179298	mean 98.9	961922 63.0	11091 7.649	9908 178.77	8558
min -12.000000 1.000000 0.000000 74.000000 0.000000 25% 57.000000 34.000000 6.000000 161.000000 7.018868 50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000	std 52.9	979869 33.69	93930 2.007	7518 28.61	3112
25% 57.000000 34.000000 6.000000 161.000000 7.018868 50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 mean 10.811286 0.179298	min -12.0	900000 1.00	0.000	74.00	9000
50% 98.000000 63.000000 8.000000 179.000000 8.457143 75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ 2705.000000 mean 10.811286 0.179298	25% 57.0	900000 34.00	90000 6.000	0000 161.00	9000
75% 140.000000 93.000000 9.000000 196.000000 9.506494 max 239.000000 119.000000 10.000000 250.000000 28.000000  rrr batting_team_Chennai Super Kings \ count 2705.000000 2705.000000 mean 10.811286 0.179298	50% 98.0	900000 63.00	90000 8.000	0000 179.00	9000
max 239.000000 119.000000 10.000000 250.000000 28.000000 rrr batting_team_Chennai Super Kings \ count 2705.000000 2705.000000 mean 10.811286 0.179298	75% 140.0	93.00	9.000	0000 196.00	9000
count 2705.000000 2705.000000 mean 10.811286 0.179298	max 239.0	000000 119.00	00000 10.000	250.00	9000
	mean 10.8	000000 811286	g_team_Chennai	2705.000000 0.179298	\

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-18.000000
                                                0.000000
min
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max
       batting team Delhi Capitals
                                       batting team Delhi Daredevils
                                                           2705.000000
count
                         2705.000000
                                                              0.035860
                            0.078743
mean
                            0.269387
                                                              0.185974
std
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                                                              0.000000
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50%
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       batting team Kings XI Punjab
                                             city Chennai
                                                              city Delhi
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count
                             0.114972
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mean
                                                  0.084288
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std
                             0.319047
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max
       city Hyderabad
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city Mohali
                                       2705.000000
count
           2705.000000
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                                                      2705.000000
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                            0.026987
mean
              0.133087
                                          0.116451
                                                         0.126433
0.097967
std
              0.339731
                            0.162076
                                          0.320824
                                                         0.332398
0.297325
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min
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              1.000000
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max
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       city Mumbai
                        city Pune
                                    city Visakhapatnam
       2705.000000
                     2705.000000
                                           2705.000000
count
           0.140111
                         0.043623
                                               0.007024
mean
           0.347166
                         0.204292
                                               0.083530
std
           0.000000
                         0.00000
                                               0.000000
min
```

```
25%
          0.000000
                       0.000000
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          0.000000
50%
                       0.000000
                                            0.000000
75%
          0.000000
                       0.000000
                                            0.000000
          1.000000
                       1.000000
                                            1.000000
max
[8 rows x 35 columns]
print(x test)
print(y test)
10397
         1
23689
         1
5280
         1
27200
         1
10618
         1
1885
         1
9903
         0
448
         1
20073
         1
21991
Name: result, Length: 10819, dtype: int64
20506
         1
15876
         1
2358
         0
9838
         0
20950
         0
27045
         1
23364
         1
13181
         0
22431
         1
5551
Name: result, Length: 2705, dtype: int64
from sklearn.model selection import train test split
x train,x test,y train,y test =
train test split(x,y,test size=0.2,random state=0)
from sklearn.linear_model import LogisticRegression
reg = LogisticRegression()
reg.fit(x train,y train)
C:\Users\Admin\anaconda3\lib\site-packages\sklearn\linear model\
_logistic.py:814: ConvergenceWarning: lbfgs failed to converge
(status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.
Increase the number of iterations (max iter) or scale the data as
shown in:
    https://scikit-learn.org/stable/modules/preprocessing.html
```

```
Please also refer to the documentation for alternative solver options:
https://scikit-learn.org/stable/modules/linear model.html#logistic-
regression
  n iter i = check optimize result(
LogisticRegression()
y pred=req.predict(x test)
from sklearn.metrics import
accuracy score, classification report, confusion matrix, r2 score
print(classification report(y test,y pred))
print(confusion_matrix(y_test,y_pred))
print("Training Score: ",reg.score(x_train,y_train)*100)
              precision
                           recall f1-score
                                               support
                             0.73
                   0.78
                                        0.75
                                                  1148
           1
                   0.81
                             0.85
                                        0.83
                                                  1557
                                        0.80
                                                  2705
    accuracy
                   0.80
                             0.79
                                        0.79
                                                  2705
   macro avg
weighted avg
                   0.80
                             0.80
                                        0.80
                                                  2705
[[ 837 311]
 [ 235 1322]]
Training Score: 79.08309455587393
final_df = pd.DataFrame({'Actual': y_test, 'Predicted': y_pred})
final df.head()
       Actual
               Predicted
2848
            0
24843
            0
                       0
8717
            0
                       0
11777
            0
                       1
9643
clfr=RandomForestClassifier(n estimators=10,criterion='entropy',random
state=0)
clfr.fit(x train,y train)
RandomForestClassifier(criterion='entropy', n estimators=10,
random state=0)
clfr1=RandomForestClassifier(n estimators=10,criterion='gini',random s
tate=0)
clfr1.fit(x train,y train)
RandomForestClassifier(n estimators=10, random state=0)
```

```
ypre1=clfr.predict(x test)# entropy ypre calculation
ypre2=clfr1.predict(x test)# gini ypre calculation
print('entropy Accuracy Score:')
accuracy score(y test,ypre1)*100
entropy Accuracy Score:
99.9630314232902
print('gini Accuracy Score:')
accuracy_score(y_test,ypre2)*100
gini Accuracy Score:
100.0
print('entropy - confusion matrix\n-----\n')
print(confusion_matrix(y_test,ypre1))
print('gini - confusion matrix\n----\n')
print(confusion matrix(y test,ypre2))
entropy - confusion matrix
[[1148 0]
    1 1556]]
gini - confusion matrix
[[1148 0]
    0 1557]]
print('entropy result\n----')
print(classification_report(y_test,yprel))
print('gini index result\n------
print(classification report(y test,ypre2))
entropy result
                         recall f1-score
             precision
                                           support
          0
                           1.00
                                    1.00
                 1.00
                                              1148
          1
                 1.00
                           1.00
                                    1.00
                                              1557
                                    1.00
                                              2705
   accuracy
                           1.00
                                    1.00
                 1.00
                                              2705
  macro avg
                           1.00
                                    1.00
                                              2705
weighted avg
                 1.00
gini index result
```

```
precision
                           recall f1-score
                                               support
           0
                   1.00
                             1.00
                                        1.00
                                                  1148
           1
                   1.00
                             1.00
                                        1.00
                                                  1557
                                        1.00
                                                  2705
    accuracy
   macro avg
                   1.00
                             1.00
                                        1.00
                                                  2705
weighted avg
                   1.00
                             1.00
                                        1.00
                                                  2705
data=pd.DataFrame({'Models':['LOGREG','RF(gini)','RF(entropy)'],
                'Accuracy':[accuracy_score(y_test,y_pred)*100,
accuracy_score(y_test,ypre1)*100,accuracy_score(y_test,ypre2)*100]})
data
        Models
                  Accuracy
        LOGREG
0
                 79.815157
      RF(gini)
                 99.963031
1
2 RF(entropy) 100.000000
```