In [78]:

```
#import all libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Input In [78], in <cell line: 7>()
      5 import seaborn as sns
      6 import warnings
----> 7 warnings.filterwarnings()

TypeError: filterwarnings() missing 1 required positional argument: 'action'
```

In [30]:

```
#read ipl.csv file and print first 5 records
df = pd.read_csv("ipl data.csv")
df.head()
```

Out[30]:

	id	season	city	date	team1	team2	toss_winner	toss_decision	result	dl_applied	winner	win_by_runs	win_by_wick
0	1	2017	Hyderabad	2017-04-05	Sunrisers Hyderabad	Royal Challengers Bangalore	Royal Challengers Bangalore	field	normal	0	Sunrisers Hyderabad	35	
1	2	2017	Pune	2017-04-06	Mumbai Indians	Rising Pune Supergiant	Rising Pune Supergiant	field	normal	0	Rising Pune Supergiant	0	
2	3	2017	Rajkot	2017-04-07	Gujarat Lions	Kolkata Knight Riders	Kolkata Knight Riders	field	normal	0	Kolkata Knight Riders	0	
3	4	2017	Indore	2017-04-08	Rising Pune Supergiant	Kings XI Punjab	Kings XI Punjab	field	normal	0	Kings XI Punjab	0	
4	5	2017	Bangalore	2017-04-08	Royal Challengers Bangalore	Delhi Daredevils	Royal Challengers Bangalore	bat	normal	0	Royal Challengers Bangalore	15	

In [31]:

```
#check total number of columns,entries note down your findings
df.columns
#Findings:-
```

Out[31]:

```
Index(['id', 'season', 'city', 'date', 'team1', 'team2', 'toss_winner',
       'toss_decision', 'result', 'dl_applied', 'winner', 'win_by_runs',
       'win_by_wickets', 'player_of_match', 'venue', 'umpire1', 'umpire2',
       'umpire3'],
      dtype='object')
```

In [32]:

```
# find null values
df.isnull().sum()
```

Out[32]:

```
id                   0
season               0
city                 7
date                 0
team1                0
team2                0
toss_winner          0
toss_decision        0
result               0
dl_applied           0
winner               3
win_by_runs          0
win_by_wickets       0
player_of_match      3
venue                0
umpire1              1
umpire2              1
umpire3            636
dtype: int64
```

In [33]:

```
#drop umpire3 column as it contains more than 75% of null values
df.drop(["umpire3"],axis=1,inplace=True)
```

In [34]:

```
#drop null values of city , winner ,player_of_match,umpire1,umpire2 column
df.dropna(axis=0, inplace=True)
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 625 entries, 0 to 635
Data columns (total 17 columns):
 #   Column           Non-Null Count  Dtype 
---  ------           --------------  ----- 
 0   id               625 non-null    int64 
 1   season           625 non-null    int64 
 2   city             625 non-null    object
 3   date             625 non-null    object
 4   team1            625 non-null    object
 5   team2            625 non-null    object
 6   toss_winner      625 non-null    object
 7   toss_decision    625 non-null    object
 8   result           625 non-null    object
 9   dl_applied       625 non-null    int64 
 10  winner           625 non-null    object
 11  win_by_runs      625 non-null    int64 
 12  win_by_wickets   625 non-null    int64 
 13  player_of_match  625 non-null    object
 14  venue            625 non-null    object
 15  umpire1          625 non-null    object
 16  umpire2          625 non-null    object
dtypes: int64(5), object(12)
memory usage: 87.9+ KB
```

In [35]:

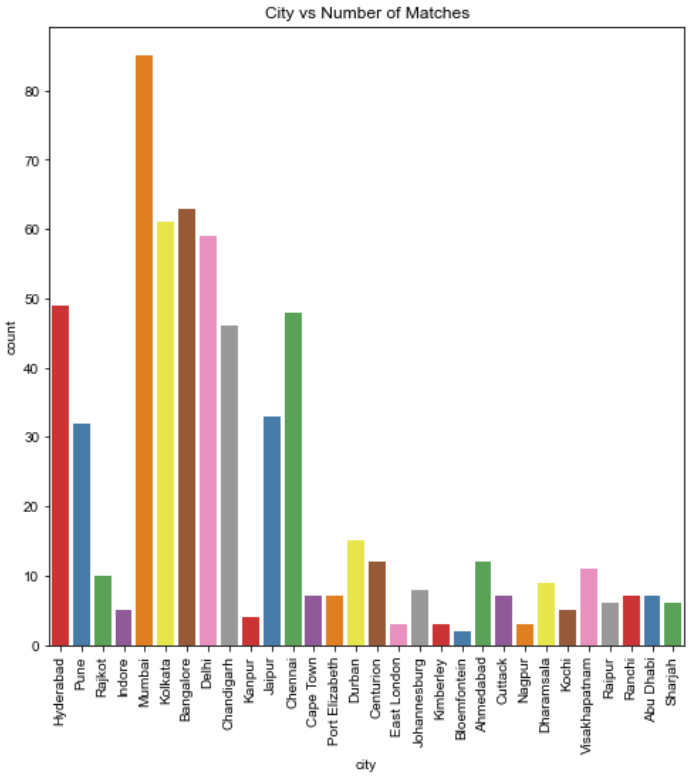
```
#which city hosted most number of matches?
#draw bar plot and write down your insights

df["city"].value_counts().head(1)
```

Out[35]:

```
Mumbai    85
Name: city, dtype: int64
```

In [38]:

```
plt.figure(figsize=(8,8))
plt.title('City vs Number of Matches')
plt.xticks(rotation=90)
sns.countplot(x='city',data=df,palette='Set1')
sns.set_style("darkgrid")
plt.show()
```



In [9]:

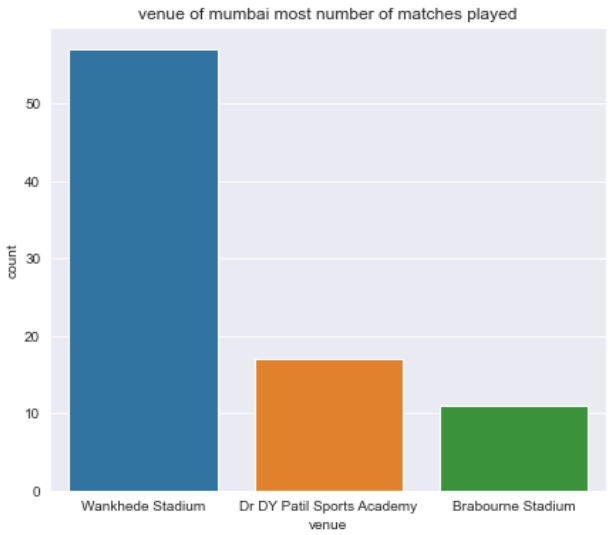
```
#find all venue of mumbai city

c = df.groupby("city").get_group("Mumbai")["venue"].value_counts()
c
```

Out[9]:

```
Wankhede Stadium              57
Dr DY Patil Sports Academy    17
Brabourne Stadium             11
Name: venue, dtype: int64
```

In [40]:

```
#now compare in which venue of mumbai most number of matches played (draw bar plot and  write down insights)
b = df.groupby("city").get_group("Mumbai")["venue"].max()
b

df[df['city']=="Mumbai"]['venue'].value_counts()
plt.figure(figsize=(7,6))
mum=df[df['city']=="Mumbai"]
sns.countplot(data=mum,x="venue")
plt.title('venue of mumbai most number of matches played')
plt.show()
```



In [41]:

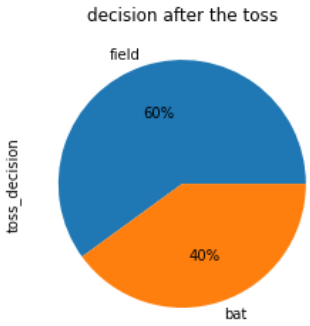
```
#what is the preferred choice after winning a toss in mumbai

a = df.groupby("city").get_group("Mumbai")["toss_decision"].value_counts()
a
```

Out[41]:

```
field    51
bat      34
Name: toss_decision, dtype: int64
```

In [12]:

```
#graphical representation of above question

a.plot.pie(autopct = "%1.0f%%")
plt.title("decision after the toss")
plt.show()
```



In [13]:

```
#which team won most number of toss :-Mumbai Indians

df.groupby("team1").get_group("Mumbai Indians")["toss_winner"].value_counts()
```

Out[13]:

```
Mumbai Indians                 40
Delhi Daredevils               10
Rajasthan Royals                6
Chennai Super Kings             5
Royal Challengers Bangalore     5
Kolkata Knight Riders           4
Deccan Chargers                 4
Kings XI Punjab                 2
Gujarat Lions                   2
Rising Pune Supergiant          1
Kochi Tuskers Kerala            1
Pune Warriors                   1
Sunrisers Hyderabad             1
Name: toss_winner, dtype: int64
```

In [42]:

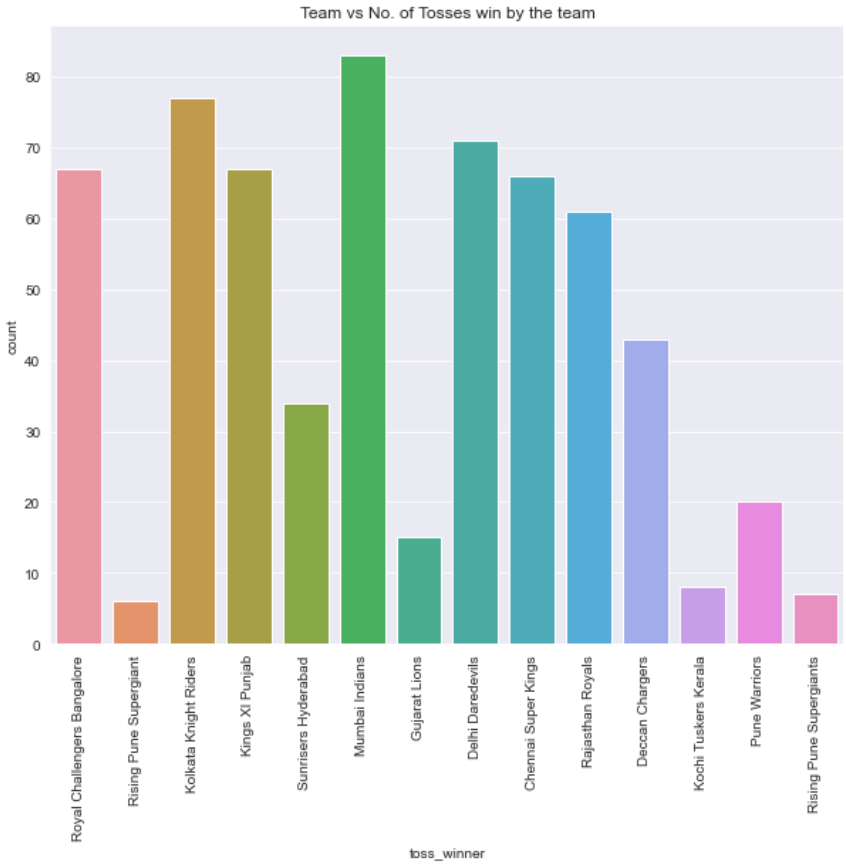
```
#show graphical representation of above question

#df.groupby("team1").get_group("Mumbai Indians")["toss_winner"].value_counts().plot.bar()

df.value_counts("toss_winner")
```

Out[42]:

```
toss_winner
Mumbai Indians                 83
Kolkata Knight Riders          77
Delhi Daredevils               71
Kings XI Punjab                67
Royal Challengers Bangalore    67
Chennai Super Kings            66
Rajasthan Royals               61
Deccan Chargers                43
Sunrisers Hyderabad            34
Pune Warriors                  20
Gujarat Lions                  15
Kochi Tuskers Kerala            8
Rising Pune Supergiants         7
Rising Pune Supergiant          6
dtype: int64
```

In [43]:

```
plt.figure(figsize=(10,8))
plt.title("Team vs No. of Tosses win by the team")
sns.countplot(x='toss_winner' ,data=df)#.sort_values('toss_winner'))
plt.xticks(rotation=90)
plt.show()
```



In [15]:

```
#find what mumbai indians preferred after winning a toss?

df.groupby("team1").get_group("Mumbai Indians")["toss_decision"].value_counts()
```

Out[15]:

```
field    42
bat      40
Name: toss_decision, dtype: int64
```

In [44]:

```
#head to head winning count of Mumbai Indians vs Chennai Super Kings

df[((df['team1']=='Chennai Super Kings') & (df['team2']=='Mumbai Indians')) | ((df['team1']=='Mumbai Indians') & (df['team2']=='C
```

Out[44]:

```
Mumbai Indians          12
Chennai Super Kings      9
Name: winner, dtype: int64
```

In [45]:

```
#Which team won most of the matches in mumbai?

df.groupby("winner").get_group("Mumbai Indians")["winner"].value_counts()
```

Out[45]:

```
Mumbai Indians    92
Name: winner, dtype: int64
```

In [76]:

```
#how many times each team won the toss and won the match in mumbai

#df.loc[df["city"]=="Mumbai"][("winner")].value_counts()
df[(df['city']=='Mumbai')& (df['toss_winner']==df['winner'])]['winner'].value_counts()
```

Out[76]:

```
Mumbai Indians                 26
Chennai Super Kings             5
Deccan Chargers                 3
Rajasthan Royals                2
Delhi Daredevils                2
Royal Challengers Bangalore     2
Kochi Tuskers Kerala            1
Kolkata Knight Riders           1
Gujarat Lions                   1
Name: winner, dtype: int64
```

In [50]:

```
#which venue hosted most number of matches
df["venue"].value_counts().head(5)
```

Out[50]:

```
M Chinnaswamy Stadium                       63
Eden Gardens                                61
Feroz Shah Kotla                            59
Wankhede Stadium                            57
Rajiv Gandhi International Stadium, Uppal   49
Name: venue, dtype: int64
```

In [57]:

```
#find how many matches chennai super kings played at M Chinnaswamy stadium?
#df.groupby("venue").get_group("M Chinnaswamy Stadium")["team1"].value_counts()

df.loc[df["venue"]=="M Chinnaswamy Stadium"][df["team1"]=="Chennai Super Kings"]["id"].count()
```

```
C:\Users\Aditya\AppData\Local\Temp\ipykernel_19944\1900927920.py:4: UserWarning: Boolean Series key will be reindex
ed to match DataFrame index.
  df.loc[df["venue"]=="M Chinnaswamy Stadium"][df["team1"]=="Chennai Super Kings"]["id"].count()
```

Out[57]:

```
4
```

In [54]:

```
#who won most matches at M Chinnaswamy stadium?--Royal Challengers Bangalore
df.groupby("venue").get_group("M Chinnaswamy Stadium")["team1"].value_counts().idxmax()
```

Out[54]:

```
'Royal Challengers Bangalore'
```

In [48]:

```
#matches played in each year
df.value_counts("season")
```

Out[48]:

```
season
2013    76
2012    74
2011    72
2010    60
2016    60
2008    58
2017    58
2009    57
2015    57
2014    53
dtype: int64
```

In [46]:

```
#which city hosted most number of matches in 2013

df.loc[df["season"]==2013]["city"].value_counts()
```

Out[46]:

```
Kolkata       8
Bangalore     8
Hyderabad     8
Delhi         8
Chennai       8
Pune          8
Jaipur        8
Mumbai        8
Chandigarh    6
Dharamsala    2
Raipur        2
Ranchi        2
Name: city, dtype: int64
```

In [58]:

```
#Lets analyse ipl season held in 2013
#extract all the details of 2013 season
#here we will create yearwise groups (hint: use groupby() function)
df.groupby("season").get_group(2013).head()
```

Out[58]:

	id	season	city	date	team1	team2	toss_winner	toss_decision	result	dl_applied	winner	win_by_runs	win_by_w
381	382	2013	Kolkata	2013-04-03	Delhi Daredevils	Kolkata Knight Riders	Kolkata Knight Riders	field	normal	0	Kolkata Knight Riders	0	
382	383	2013	Bangalore	2013-04-04	Royal Challengers Bangalore	Mumbai Indians	Mumbai Indians	field	normal	0	Royal Challengers Bangalore	2	
383	384	2013	Hyderabad	2013-04-05	Sunrisers Hyderabad	Pune Warriors	Pune Warriors	field	normal	0	Sunrisers Hyderabad	22	
384	385	2013	Delhi	2013-04-06	Rajasthan Royals	Delhi Daredevils	Rajasthan Royals	bat	normal	0	Rajasthan Royals	5	
385	386	2013	Chennai	2013-04-06	Mumbai Indians	Chennai Super Kings	Mumbai Indians	bat	normal	0	Mumbai Indians	9	

In [63]:

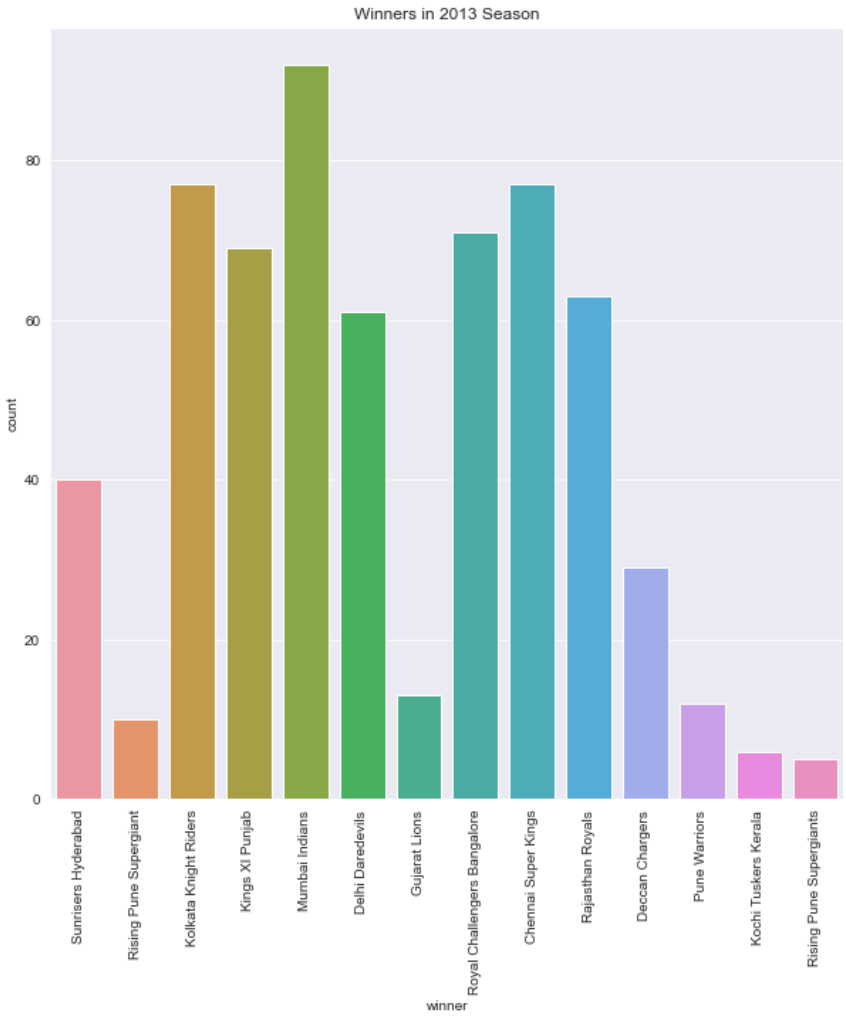
```
year = df.groupby("season")["winner"].value_counts()
year[2013]
```

Out[63]:

```
winner
Mumbai Indians                 13
Chennai Super Kings            12
Rajasthan Royals               11
Sunrisers Hyderabad            10
Royal Challengers Bangalore     9
Kings XI Punjab                 8
Kolkata Knight Riders           6
Pune Warriors                   4
Delhi Daredevils                3
Name: winner, dtype: int64
```

In [72]:

```
plt.figure(figsize=(10,10))
plt.title("Winners in 2013 Season")
sns.countplot(x='winner' ,data=df)
plt.xticks(rotation=90)
plt.show()
```



In [ ]: