```
In [1]:  import pandas as pd
         import numpy as np
         import seaborn as sns
         import matplotlib.pyplot as plt

         %pylab inline
         import warnings
         warnings.filterwarnings('ignore')
```

Populating the interactive namespace from numpy and matplotlib

```
In [2]:  ipl = pd.read_csv('C:\\Users\\91755\\Desktop\\vscode\\ipl_2022_dataset.csv')
```

```
In [3]:  ipl.head()
```

Out[3]:

	Unnamed: 0	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team
0	0	Rashid Khan	Draft Pick	BOWLER	15.0	1950.0	SRH	Gujarat Titans
1	1	Hardik Pandya	Draft Pick	ALL-ROUNDER	15.0	1950.0	MI	Gujarat Titans
2	2	Lockie Ferguson	2 Cr	BOWLER	10.0	1300.0	KKR	Gujarat Titans
3	3	Rahul Tewatia	40 Lakh	ALL-ROUNDER	9.0	1170.0	RR	Gujarat Titans
4	4	Shubman Gill	Draft Pick	BATTER	8.0	1040.0	KKR	Gujarat Titans

```
In [4]:  ipl.shape
```

Out[4]: (633, 8)

```
In [5]:  ipl.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 633 entries, 0 to 632
Data columns (total 8 columns):
 #   Column          Non-Null Count  Dtype
```

```
---   ------           --------------   -----
 0    Unnamed: 0       633 non-null     int64
 1    Player           633 non-null     object
 2    Base Price       633 non-null     object
 3    TYPE             633 non-null     object
 4    COST IN ₹ (CR.)  237 non-null     float64
 5    Cost IN $ (000)  237 non-null     float64
 6    2021 Squad       199 non-null     object
 7    Team             633 non-null     object
dtypes: float64(2), int64(1), object(5)
```

In [6]:
```python
ipl.columns
```

Out[6]:
```
Index(['Unnamed: 0', 'Player', 'Base Price', 'TYPE', 'COST IN ₹ (CR.)',
       'Cost IN $ (000)', '2021 Squad', 'Team'],
      dtype='object')
```

In [7]:
```python
ipl.drop('Unnamed: 0',axis=1, inplace = True)
```

In [8]:
```python
ipl.head()
```

Out[8]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team
0	Rashid Khan	Draft Pick	BOWLER	15.0	1950.0	SRH	Gujarat Titans
1	Hardik Pandya	Draft Pick	ALL-ROUNDER	15.0	1950.0	MI	Gujarat Titans
2	Lockie Ferguson	2 Cr	BOWLER	10.0	1300.0	KKR	Gujarat Titans
3	Rahul Tewatia	40 Lakh	ALL-ROUNDER	9.0	1170.0	RR	Gujarat Titans
4	Shubman Gill	Draft Pick	BATTER	8.0	1040.0	KKR	Gujarat Titans

In [9]:
```python
ipl.isnull().sum()
```

Out[9]:
```
Player             0
Base Price         0
TYPE               0
COST IN ₹ (CR.)    396
Cost IN $ (000)    396
```

```
2021 Squad      434
Team              0
```

In [10]:
```python
ipl[ipl['Cost IN $ (000)'].isnull()]
```

Out[10]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team
237	Suresh Raina	2 Cr	BATTER	NaN	NaN	CSK	Unsold
238	Steve Smith	2 Cr	BATTER	NaN	NaN	DC	Unsold
239	Shakib Al Hasan	2 Cr	ALL-ROUNDER	NaN	NaN	KKR	Unsold
240	Amit Mishra	1.5 Cr	BOWLER	NaN	NaN	DC	Unsold
241	Adil Rashid	2 Cr	BOWLER	NaN	NaN	PBKS	Unsold
...	...	...	...	...	...	...	...
628	Sairaj Patil	20 Lakh	BATTER	NaN	NaN	NaN	Unsold
629	Monu Singh	20 Lakh	BOWLER	NaN	NaN	NaN	Unsold
630	Nivethan Radhakrishnan	20 Lakh	BOWLER	NaN	NaN	NaN	Unsold
631	Lance Morris	20 Lakh	BOWLER	NaN	NaN	NaN	Unsold
632	Aaron Hardie	20 Lakh	ALL-ROUNDER	NaN	NaN	NaN	Unsold

396 rows × 7 columns

In [11]:
```python
ipl['COST IN ₹ (CR.)'] = ipl['COST IN ₹ (CR.)'].fillna(0)
ipl['Cost IN $ (000)'] = ipl['Cost IN $ (000)'].fillna(0)
```

In [12]:
```python
ipl[ipl['2021 Squad'].isnull()]
```

Out[12]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team
6	Yash Dayal	20 Lakh	BOWLER	3.2	416.0	NaN	Gujarat Titans
9	Abhinav Sadarangani	20 Lakh	BATTER	2.6	338.0	NaN	Gujarat Titans

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team
10	Matthew Wade	2 Cr	WICKETKEEPER	2.4	312.0	NaN	Gujarat Titans
11	Alzarri Joseph	75 Lakh	BOWLER	2.4	312.0	NaN	Gujarat Titans
17	Varun Aaron	50 Lakh	BOWLER	0.5	65.0	NaN	Gujarat Titans
...	...	...	...	...	...	...	...
628	Sairaj Patil	20 Lakh	BATTER	0.0	0.0	NaN	Unsold
629	Monu Singh	20 Lakh	BOWLER	0.0	0.0	NaN	Unsold
630	Nivethan Radhakrishnan	20 Lakh	BOWLER	0.0	0.0	NaN	Unsold
631	Lance Morris	20 Lakh	BOWLER	0.0	0.0	NaN	Unsold
632	Aaron Hardie	20 Lakh	ALL-ROUNDER	0.0	0.0	NaN	Unsold

In [13]:
```python
ipl['2021 Squad'] = ipl['2021 Squad'].fillna('Not Participated')
```

In [14]:
```python
ipl.isnull().sum()
```

Out[14]:
```
Player             0
Base Price         0
TYPE               0
COST IN ₹ (CR.)    0
Cost IN $ (000)    0
2021 Squad         0
Team               0
dtype: int64
```

In [15]:
```python
teams = ipl[ipl['COST IN ₹ (CR.)']>0]['Team'].unique()
```

In [16]:
```python
teams
```

Out[16]:
```
array(['Gujarat Titans', 'Chennai Super Kings', 'Delhi Capitals',
       'Kolkata Knight Riders', 'Punjab Kings', 'Lucknow Super Giants',
       'Mumbai Indians', 'Royal Challengers Bangalore',
```

```
In [17]:    ipl['status'] = ipl['Team'].replace(teams,'sold')
```

```
In [18]:    ipl.head()
```

Out[18]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status
0	Rashid Khan	Draft Pick	BOWLER	15.0	1950.0	SRH	Gujarat Titans	sold
1	Hardik Pandya	Draft Pick	ALL-ROUNDER	15.0	1950.0	MI	Gujarat Titans	sold
2	Lockie Ferguson	2 Cr	BOWLER	10.0	1300.0	KKR	Gujarat Titans	sold
3	Rahul Tewatia	40 Lakh	ALL-ROUNDER	9.0	1170.0	RR	Gujarat Titans	sold
4	Shubman Gill	Draft Pick	BATTER	8.0	1040.0	KKR	Gujarat Titans	sold

```
In [19]:    ipl[ipl['Player'].duplicated(keep=False)]
```

Out[19]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status
62	Lalit Yadav	20 Lakh	ALL-ROUNDER	0.65	84.5	DC	Delhi Capitals	sold
240	Amit Mishra	1.5 Cr	BOWLER	0.00	0.0	DC	Unsold	Unsold
499	Amit Mishra	20 Lakh	BOWLER	0.00	0.0	Not Participated	Unsold	Unsold
518	Shivam Sharma	20 Lakh	ALL-ROUNDER	0.00	0.0	Not Participated	Unsold	Unsold
530	Lalit Yadav	20 Lakh	BOWLER	0.00	0.0	Not Participated	Unsold	Unsold
537	Shubham Singh	20 Lakh	ALL-ROUNDER	0.00	0.0	Not Participated	Unsold	Unsold
544	Shubham Singh	20 Lakh	BOWLER	0.00	0.0	Not Participated	Unsold	Unsold
569	Shivam Sharma	20 Lakh	ALL-ROUNDER	0.00	0.0	Not Participated	Unsold	Unsold

```
In [20]:   #how many players participated in 2o22 iPl auction?

           ipl.shape[0]
```

Out[20]: 633

```
In [21]:   #how many types of player participated
           types = ipl['TYPE'].value_counts()
           types.reset_index()
```

Out[21]:

	index	TYPE
0	ALL-ROUNDER	242
1	BOWLER	215
2	BATTER	112
3	WICKETKEEPER	64

```
In [22]:   plt.pie(types.values, labels=types.index,labeldistance = 1.2,autopct = '%1.2f%%',shadow = True,startangle = 60)
           plt.title('Role of Players Participated', fontsize = 15)
           plt.plot()
```
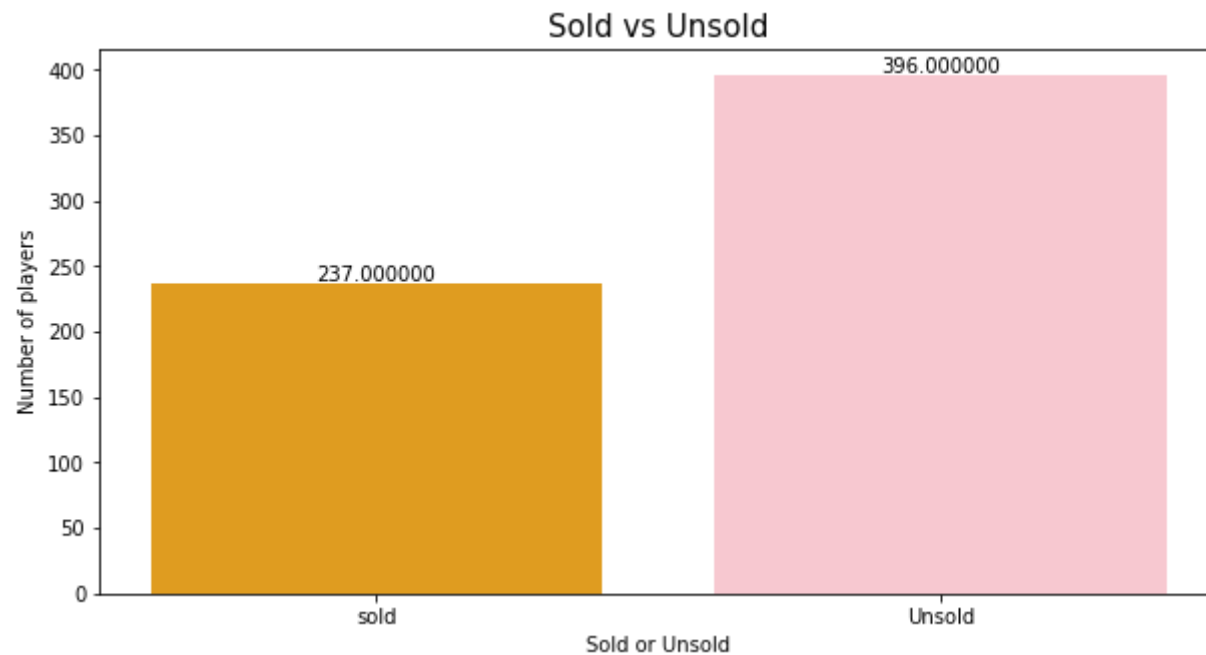
Out[22]: []

Role of Players Participated

In [23]:

```python
#players sold and unsold using bar graph

plt.figure(figsize(10,5))
fig = sns.countplot(ipl['status'],palette=['Orange','Pink'])
plt.xlabel('Sold or Unsold')
plt.ylabel('Number of players')
plt.title('Sold vs Unsold',fontsize =15)
plt.plot()

for p in fig.patches:
    fig.annotate(format(p.get_height(), '0f'),(p.get_x()+p.get_width()/2., p.get_height()),ha = 'center', va='center'
```


In [24]:

```python
ipl.groupby('status')['Player'].count()
```
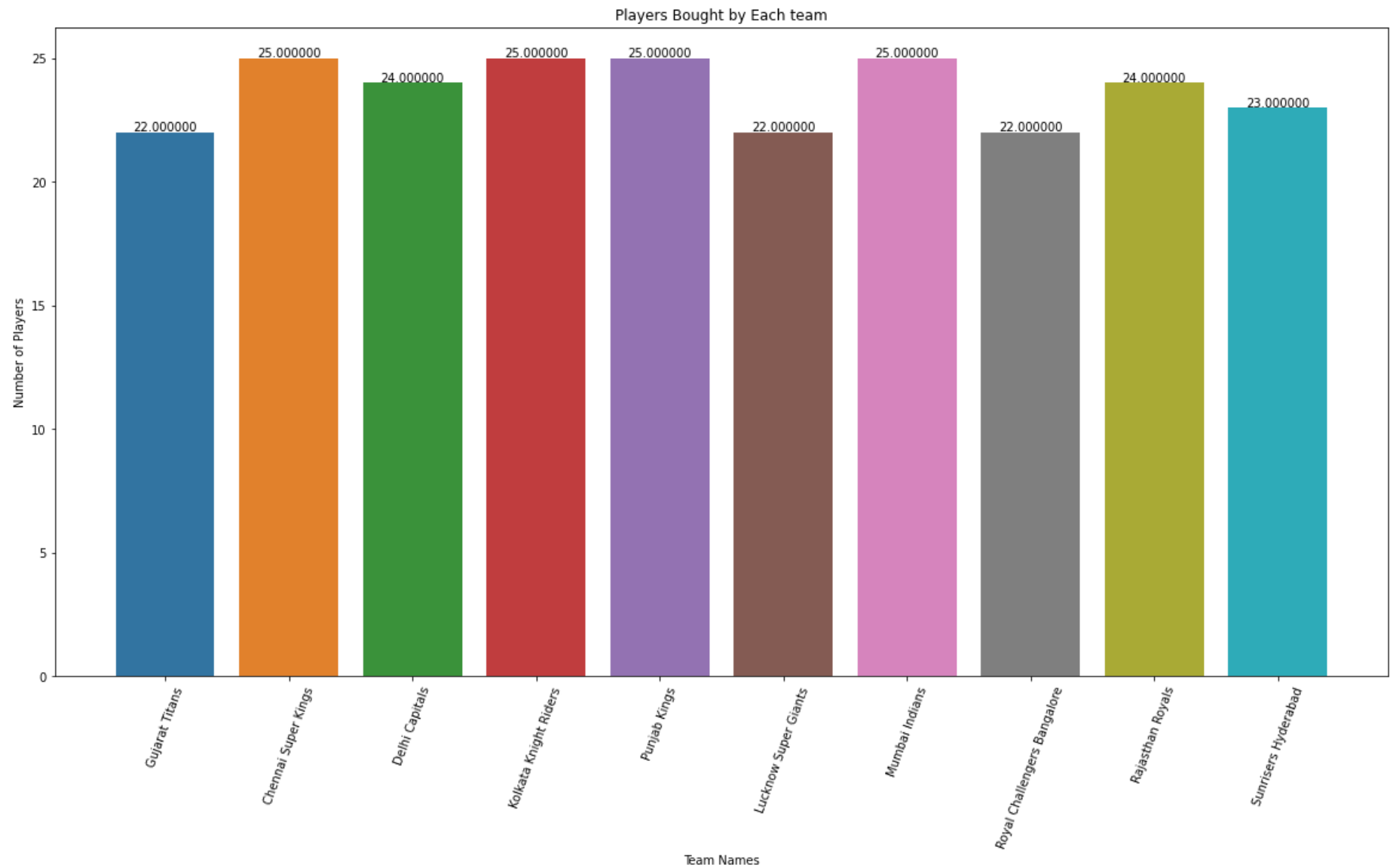
Out[24]:
```
status
Unsold    396
sold      237
```

```
          Name: Player, dtype: int64

In [25]:  # Total number of players bought by each team
          plt.figure(figsize = (20,10))
          fig = sns.countplot(ipl[ipl['Team']!='Unsold']['Team'])
          plt.xlabel('Team Names')
          plt.ylabel('Number of Players')
          plt.title('Players Bought by Each team',fontsize =12)
          plt.xticks(rotation = 70)
          plt.plot()


          for p in fig.patches:
              fig.annotate(format(p.get_height(), '0f'),(p.get_x()+p.get_width()/2., p.get_height()),ha = 'center', va='center'
```

Players Bought by Each team

```
In [27]: ipl['retentation'] = ipl['Base Price']
```

```
In [28]: ipl['retentation'].replace(['2 Cr','40 Lakh', '20 Lakh','1 Cr','75 Lakh','50 Lakh','30 Lakh','1.5 Cr'],'From Auction'
```

```
In [29]:  #treating base price

          ipl['Base Price'].replace('Draft Pick',0,inplace = True)
```

```
In [30]:  ipl['base_price_unit']= ipl['Base Price'].apply(lambda x:str(x).split(' ')[-1])
          ipl['base_price'] = ipl['Base Price'].apply(lambda x: str(x).split(' ')[0])
```

```
In [31]:  ipl['base_price'].replace('Retained',0,inplace = True)
```

```
In [32]:  ipl.head()
```

Out[32]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retentation	base_price_unit	base_price
0	Rashid Khan	0	BOWLER	15.0	1950.0	SRH	Gujarat Titans	sold	Draft Pick	0	0
1	Hardik Pandya	0	ALL-ROUNDER	15.0	1950.0	MI	Gujarat Titans	sold	Draft Pick	0	0
2	Lockie Ferguson	2 Cr	BOWLER	10.0	1300.0	KKR	Gujarat Titans	sold	From Auction	Cr	2
3	Rahul Tewatia	40 Lakh	ALL-ROUNDER	9.0	1170.0	RR	Gujarat Titans	sold	From Auction	Lakh	40
4	Shubman Gill	0	BATTER	8.0	1040.0	KKR	Gujarat Titans	sold	Draft Pick	0	0

```
In [33]:  #total players retained and bought
          ipl.groupby(['Team','retentation'])['retentation'].count()[:-1]
```

```
Out[33]:  Team                   retentation
          Chennai Super Kings    From Auction    21
                                 Retained         4
          Delhi Capitals         From Auction    20
                                 Retained         4
```
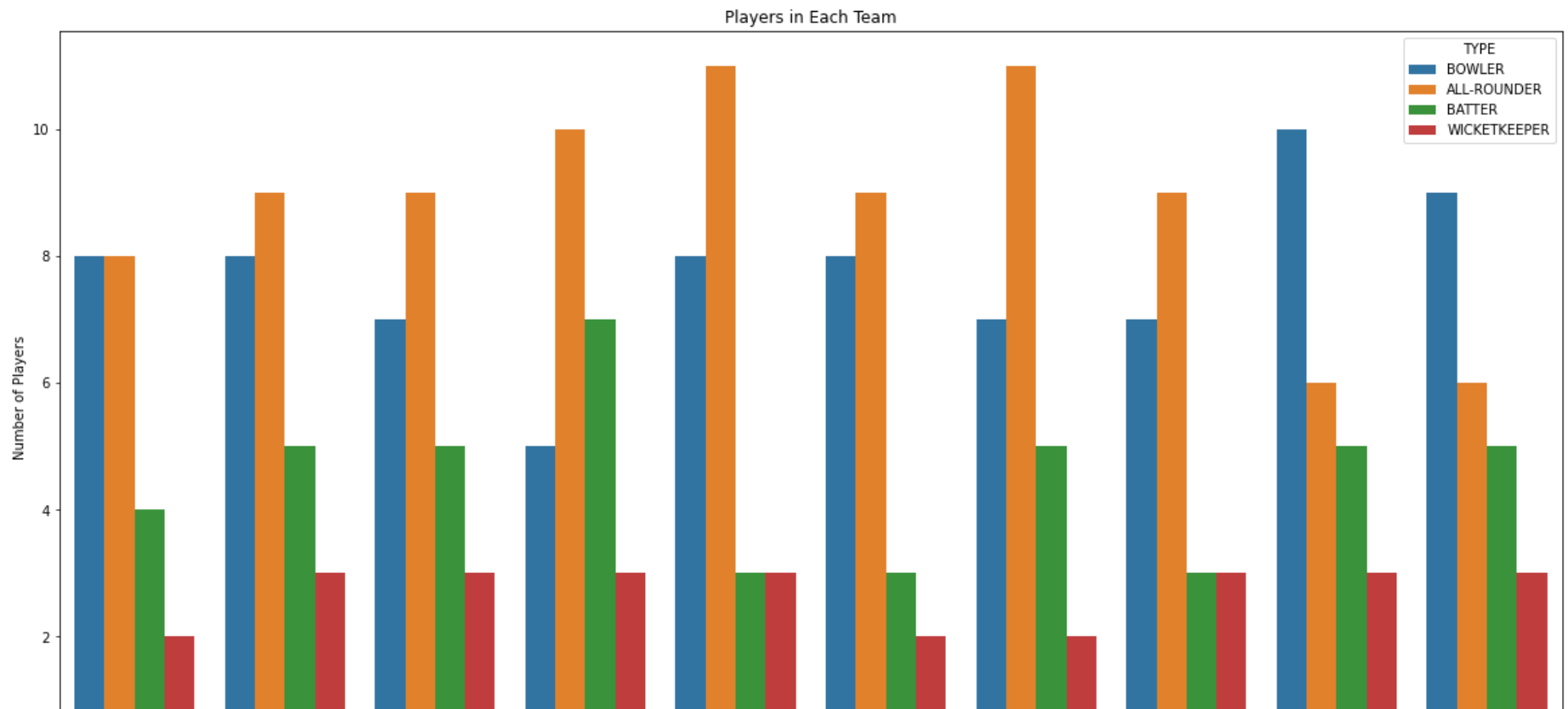
```
Gujarat Titans              Draft Pick      3
                            From Auction   19
Kolkata Knight Riders       From Auction   21
                            Retained        4
Lucknow Super Giants        Draft Pick      3
                            From Auction   19
Mumbai Indians              From Auction   21
                            Retained        4
Punjab Kings                From Auction   23
                            Retained        2
Rajasthan Royals            From Auction   21
                            Retained        3
Royal Challengers Bangalore From Auction   19
                            Retained        3
Sunrisers Hyderabad         From Auction   20
                            Retained        3
Name: retentation, dtype: int64
```

In [34]:
```python
plt.figure(figsize = (20,10))
fig = sns.countplot(ipl[ipl['Team']!='Unsold']['Team'],hue=ipl['TYPE'])
plt.title('Players in Each Team')
plt.xlabel('Team Names')
plt.ylabel('Number of Players')
plt.xticks(rotation= 50)
```

Out[34]: (array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
         [Text(0, 0, 'Gujarat Titans'),
          Text(1, 0, 'Chennai Super Kings'),
          Text(2, 0, 'Delhi Capitals'),
          Text(3, 0, 'Kolkata Knight Riders'),
          Text(4, 0, 'Punjab Kings'),
          Text(5, 0, 'Lucknow Super Giants'),
          Text(6, 0, 'Mumbai Indians'),
          Text(7, 0, 'Royal Challengers Bangalore'),
          Text(8, 0, 'Rajasthan Royals'),
          Text(9, 0, 'Sunrisers Hyderabad')])

Players in Each Team

In [36]: `#highest amount spent on a single player on each team`

`ipl[ipl['retentation']=='From Auction'].groupby(['Team'])['COST IN ₹ (CR.)'].max()[:-1].sort_values(ascending = False`

Out[36]:
```
Team
Mumbai Indians                15.25
Chennai Super Kings           14.00
Kolkata Knight Riders         12.25
Punjab Kings                  11.50
Delhi Capitals                10.75
Royal Challengers Bangalore   10.75
Sunrisers Hyderabad           10.75
Gujarat Titans                10.00
Lucknow Super Giants          10.00
Rajasthan Royals              10.00
Name: COST IN ₹ (CR.), dtype: float64
```

```
In [37]:    #Player retained at maximum price.
            ipl[ipl['retentation']=='Retained'].sort_values(by = 'COST IN ₹ (CR.)',ascending = False).head(1)
```

Out[37]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retentation	base_price_unit	base_price
22	Ravindra Jadeja	Retained	ALL-ROUNDER	16.0	2080.0	CSK	Chennai Super Kings	sold	Retained	Retained	0

```
In [40]:    #top 5 bolwers
            ipl[(ipl['retentation']=='From Auction')&(ipl['TYPE']=='BOWLER')].sort_values(by = 'COST IN ₹ (CR.)',ascending = Fals
```

Out[40]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retentation	base_price_unit	base_price
23	Deepak Chahar	2 Cr	BOWLER	14.00	1820.0	CSK	Chennai Super Kings	sold	From Auction	Cr	2
48	Shardul Thakur	2 Cr	BOWLER	10.75	1397.5	CSK	Delhi Capitals	sold	From Auction	Cr	2
192	Prasidh Krishna	1 Cr	BOWLER	10.00	1300.0	KKR	Rajasthan Royals	sold	From Auction	Cr	1
2	Lockie Ferguson	2 Cr	BOWLER	10.00	1300.0	KKR	Gujarat Titans	sold	From Auction	Cr	2
122	Avesh Khan	20 Lakh	BOWLER	10.00	1300.0	DC	Lucknow Super Giants	sold	From Auction	Lakh	20

```
In [41]:    #top 5 batsman
            ipl[(ipl['retentation']=='From Auction')&(ipl['TYPE']=='BATTER')].sort_values(by = 'COST IN ₹ (CR.)',ascending = Fals
```

Out[41]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retentation	base_price_unit	base_price
71	Shreyas Iyer	2 Cr	BATTER	12.25	1592.5	DC	Kolkata Knight Riders	sold	From Auction	Cr	2

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retention	base_price_unit	base_price
193	Shimron Hetmyer	1.5 Cr	BATTER	8.50	1105.0	DC	Rajasthan Royals	sold	From Auction	Cr	1.5
217	Rahul Tripathi	40 Lakh	BATTER	8.50	1105.0	KKR	Sunrisers Hyderabad	sold	From Auction	Lakh	40
100	Shikhar Dhawan	2 Cr	BATTER	8.25	1072.5	DC	Punjab Kings	sold	From Auction	Cr	2

In [42]:
```python
#top 5 all-rounder
ipl[(ipl['retention']=='From Auction')&(ipl['TYPE']=='ALL-ROUNDER')].sort_values(by = 'COST IN ₹ (CR.)',ascending =
```

Out[42]:

	Player	Base Price	TYPE	COST IN ₹ (CR.)	Cost IN $ (000)	2021 Squad	Team	status	retention	base_price_unit	base_price
97	Liam Livingstone	1 Cr	ALL-ROUNDER	11.50	1495.0	RR	Punjab Kings	sold	From Auction	Cr	1
170	Wanindu Hasaranga	1 Cr	ALL-ROUNDER	10.75	1397.5	RCB	Royal Challengers Bangalore	sold	From Auction	Cr	1
171	Harshal Patel	2 Cr	ALL-ROUNDER	10.75	1397.5	RCB	Royal Challengers Bangalore	sold	From Auction	Cr	2
99	Shahrukh Khan	40 Lakh	ALL-ROUNDER	9.00	1170.0	PBKS	Punjab Kings	sold	From Auction	Lakh	40
3	Rahul Tewatia	40 Lakh	ALL-ROUNDER	9.00	1170.0	RR	Gujarat Titans	sold	From Auction	Lakh	40

In [43]:
```python
#Players who were picked for last season but not 2022
```

In [44]:
```python
ipl = ipl.rename(columns={'2021 Squad':'Prev_team'})
```

In [49]:
```python
unsold_players = ipl[(ipl.Prev_team != 'Not Participated')&(ipl.Team =='Unsold')][['Player','Prev_team','Base Price']
```

```
In [50]:  print(unsold_players)
```

```
                     Player Prev_team Base Price
237             Suresh Raina       CSK       2 Cr
238              Steve Smith        DC       2 Cr
239          Shakib Al Hasan       KKR       2 Cr
240              Amit Mishra        DC     1.5 Cr
241              Adil Rashid      PBKS       2 Cr
242              Imran Tahir       CSK       2 Cr
243            Mujeeb Zadran       SRH       2 Cr
244               Adam Zampa       RCB       2 Cr
245            Rajat Patidar       RCB    20 Lakh
246      Mohammed Azharuddeen      RCB    20 Lakh
249             M. Siddharth        DC    20 Lakh
252              Dawid Malan      PBKS     1.5 Cr
253              Eoin Morgan       KKR     1.5 Cr
254         Cheteshwar Pujara      CSK    50 Lakh
255            Saurabh Tiwary        MI    50 Lakh
257             Ishant Sharma       DC     1.5 Cr
259              Piyush Chawla       MI       1 Cr
260             Tabraiz Shamsi       RR       1 Cr
262               Sachin Baby      RCB    20 Lakh
267                Virat Singh      SRH    20 Lakh
269                Akash Singh       RR    20 Lakh
273                  Chris Lynn       MI     1.5 Cr
276               George Garton      RCB    50 Lakh
288                  Andrew Tye       RR       1 Cr
289             Sandeep Warrier      KKR    50 Lakh
311           Shreevats Goswami      SRH    20 Lakh
313                 Aditya Tare       MI    20 Lakh
317      Lukman Hussain Meriwala    DC    20 Lakh
325                 Jalaj Saxena     PBKS    30 Lakh
337                 Ben Cutting      KKR    75 Lakh
339             Moises Henriques     PBKS      1 Cr
342            Scott Kuggeleijn      RCB    75 Lakh
343                  Pawan Negi      KKR    50 Lakh
346              Dhawal Kulkarni      MI    75 Lakh
348              Kane Richardson     RCB     1.5 Cr
404                 Kedar Jadhav      SRH      1 Cr
429               Yudhvir Charak      MI    20 Lakh
447            Kulwant Khejroliya    DC    20 Lakh
535               Anirudha Joshi     DC    20 Lakh
623             Agnivesh Ayachi    PBKS    20 Lakh
```

In [ ]: