Pro Kabaddi League (PKL) Analysis

Introduction

Pro Kabaddi League or abbreviated to PKL is a men's professional Kabaddi league of India. It was launched in 2014 and is broadcast on Star Sports.

The league's inception was influenced by the popularity of the Kabaddi tournament at the 2006 Asian Games. The format of the competition was influenced by the Indian Premier League.

Format

The Pro Kabaddi League's rules are similar to that of the indoor team version of Kabaddi, but with additional rules to encourage more scoring. Kabaddi is a contact team sport, played between two teams of seven players.

The objective of the game is for a single player on offence, referred to as a "raider", to run into the opposing team's half of a court, touch out as many of their defenders as possible, and return to their own half of the court, all without being tackled by the defenders, and in a single breath. Points are scored for each player tagged by the raider, while the opposing team earns a point for stopping the raider. Players are taken out of the game if they are touched or tackled, but are brought back in for each point scored by their team from a tags or tackle. Playing two "empty" raids in a row will trigger a "Do or Die", where the raider must score a point or they will be declared out. When a defensive side has three or fewer players remaining, tackles scored are termed as "Super Tackle", which is worth two points instead of one

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

In [2]:
```python
df = pd.read_html('https://en.wikipedia.org/wiki/Pro_Kabaddi_League#References')
```

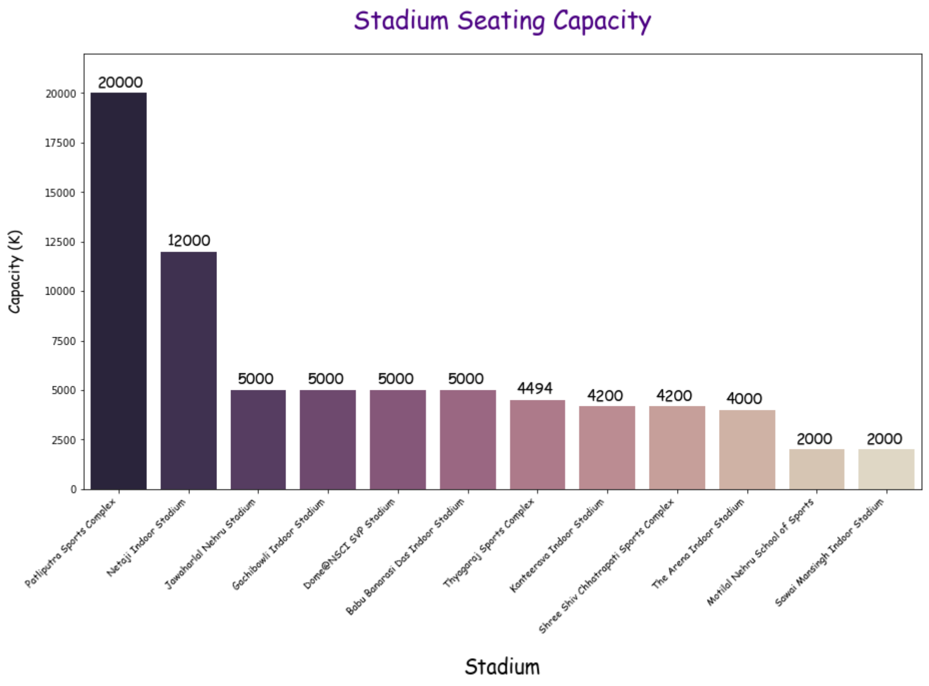
In [3]:
```python
df_teams = df[3]
df_teams.rename(columns={'Stadium[38]': 'Stadium'}, inplace=True)
df_teams
```

Out[3]:

	Team	City/State	Stadium	Capacity
0	Bengal Warriors	Kolkata, West Bengal	Netaji Indoor Stadium	12000
1	Bengaluru Bulls	Bengaluru, Karnataka	Kanteerava Indoor Stadium	4200
2	Dabang Delhi KC	Delhi	Thyagaraj Sports Complex	4494
3	Gujarat Giants	Ahmedabad, Gujarat	The Arena Indoor Stadium	4000
4	Haryana Steelers	Sonipat, Haryana	Motilal Nehru School of Sports	2000
5	Jaipur Pink Panthers	Jaipur, Rajasthan	Sawai Mansingh Indoor Stadium	2000
6	Patna Pirates	Patna, Bihar	Patliputra Sports Complex	20000
7	Puneri Paltan	Pune, Maharashtra	Shree Shiv Chhatrapati Sports Complex	4200
8	Tamil Thalaivas	Chennai, Tamilnadu	Jawaharlal Nehru Stadium	5000
9	Telugu Titans	Hyderabad/Vizag, Telangana	Gachibowli Indoor Stadium	5000
10	U Mumba	Mumbai, Maharashtra	Dome@NSCI SVP Stadium	5000
11	UP Yoddha	Lucknow, Uttar Pradesh	Babu Banarasi Das Indoor Stadium	5000

Which Stadium has the highest seating Capacity

In [4]:
```python
df_teams.sort_values(by='Capacity', ascending=False, inplace=True)
plt.figure(figsize=(15,8))
sns.barplot(x=df_teams['Stadium'], y=df_teams['Capacity'], palette='ch:s=-.2,r=.6_r') #_r to revrese the color order
plt.xticks(rotation=45, ha='right', family='cursive')
plt.title("Stadium Seating Capacity", fontsize=25, pad=25, family='cursive', color='indigo')
plt.xlabel("Stadium", fontsize=20, labelpad=20,family='cursive')
plt.ylabel("Capacity (K)", fontsize=15, labelpad=20,family='cursive')
plt.ylim(0,22000)

df_ann = df_teams['Capacity']

for x, y in enumerate(df_ann):
    plt.annotate(y, (x-.3,y+300),family='cursive', fontsize=15)
```



How was the Best raider and Best Defender across Season

In [5]:
```python
df[4].rename(columns={'Season': 'Season', 'Winner':'Winner', 'Result':'Result', 'Final venue': 'Venue'
                     , 'No. of teams': 'No of Teams', 'Best raider (Most raid points)': 'Best Raider', 'Best defender (Most tackle points)': 'Best Defender'}, inplace
df[4].loc[8] = ['Season', 'Winner', 'Result','Runner Up', 'Venue', 'No of Teams', 'Best Raider', 'Best Defender', 'Most Total Points']

df[4].columns = df[4].iloc[8]
df[4].rename(index={8:'Sl No'}, inplace=True)
df[4].columns = df[4].iloc[8]
df[4].drop(['Sl No'],axis=0, inplace=True)
df_pkl_results = df[4]
df_pkl_results.loc[7].replace({'2021-22':'2021'}, inplace=True)

for i in range(len(df_pkl_results)):
    df_pkl_results['Result'][i]=df_pkl_results['Result'][i][:5]

col = ['Best Raider', 'Best Defender', 'Most Total Points']
for i in col:
    df_pkl_results[i] = df_pkl_results[i].str.replace('[', '')
    df_pkl_results[i] = df_pkl_results[i].str.replace(']', '')
    df_pkl_results[i] = df_pkl_results[i].str.replace('\d+', '')# To remove number from column
    df_pkl_results[i] = df_pkl_results[i].str.rstrip()

df_pkl_results[['Winners Points', 'Loosers Points']] = df_pkl_results['Result'].str.split('-', expand=True)

df_pkl_results = df_pkl_results.astype({'Winners Points': int, "Loosers Points":int, 'No of Teams':int})
df_pkl_results["Won by"] = df_pkl_results['Winners Points'] - df_pkl_results['Loosers Points']

print("Best Players across Season")
df_pkl_results[['Season', 'Best Raider', 'Best Defender', 'Most Total Points']]
```

```
Best Players across Season

C:\Users\Premk\AppData\Local\Temp/ipykernel_4652/1205858404.py:17: FutureWarning: The default value of regex will change from True to False in a future version. In additi
on, single character regular expressions will *not* be treated as literal strings when regex=True.
  df_pkl_results[i] = df_pkl_results[i].str.replace('[', '')
C:\Users\Premk\AppData\Local\Temp/ipykernel_4652/1205858404.py:18: FutureWarning: The default value of regex will change from True to False in a future version. In additi
on, single character regular expressions will *not* be treated as literal strings when regex=True.
  df_pkl_results[i] = df_pkl_results[i].str.replace(']', '')
C:\Users\Premk\AppData\Local\Temp/ipykernel_4652/1205858404.py:19: FutureWarning: The default value of regex will change from True to False in a future version.
  df_pkl_results[i] = df_pkl_results[i].str.replace('\d+', '')# To remove number from column
```

Out[5]:

Sl No	Season	Best Raider	Best Defender	Most Total Points
0	2014	Anup Kumar	Manjeet Chhillar	Anup Kumar
1	2015	Kashiling Adake	Ravinder Pahal	Kashiling Adake
2	2016	Pardeep Narwal	Manjeet Chhillar	Pardeep Narwal
3	2016	Rahul Chaudhari	Fazel Atrachali	Rahul Chaudhari
4	2017	Pardeep Narwal	Surender Nada	Pardeep Narwal
5	2018	Pawan Sehrawat	Nitesh Kumar	Pawan Sehrawat
6	2019	Pawan Sehrawat	Fazel Atrachali	Pawan Sehrawat
7	2021	Pawan Sehrawat	Mohammadreza Chiyaneh	Pawan Sehrawat

By how many points did the finalist won.

In [6]:
```python
print("Win Margin",'\n', '-'*100)
for i in range(len(df_pkl_results)):
    print("In", df_pkl_results['Season'][i], df_pkl_results['Winner'][i],"won by", df_pkl_results['Winners Points'][i], "points over" ,df_pkl_results['Runner Up'][i])
```

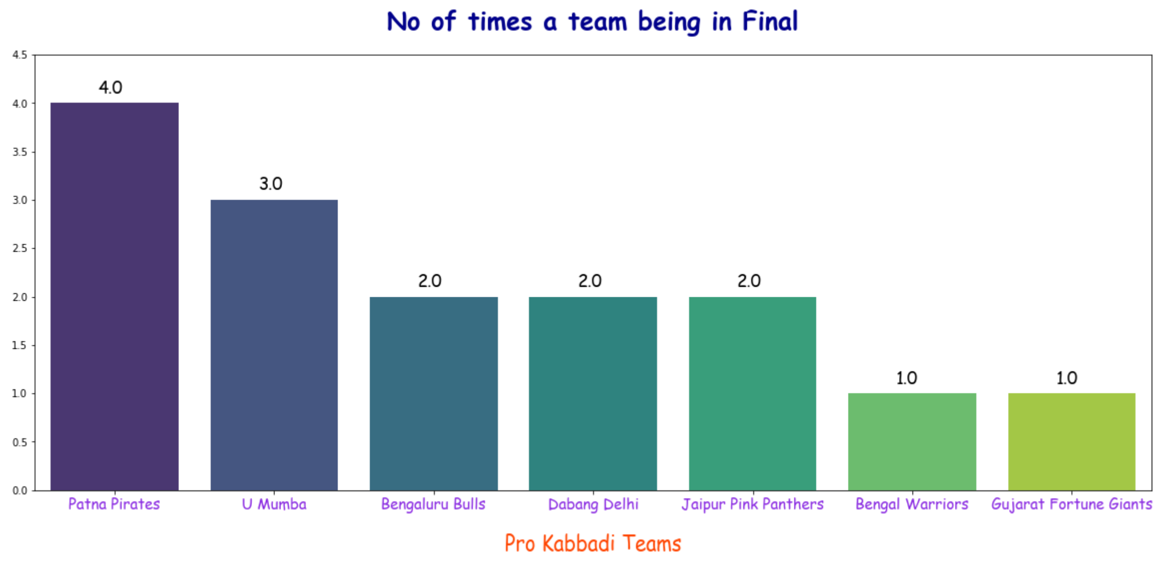
```
Win Margin
 ----------------------------------------------------------------------------------------------------
In 2014 Jaipur Pink Panthers won by 35 points over U Mumba
In 2015 U Mumba won by 36 points over Bengaluru Bulls
In 2016 Patna Pirates won by 31 points over U Mumba
In 2016 Patna Pirates won by 37 points over Jaipur Pink Panthers
In 2017 Patna Pirates won by 55 points over Gujarat Fortune Giants
In 2018 Bengaluru Bulls won by 38 points over Gujarat Fortune Giants
In 2019 Bengal Warriors won by 39 points over Dabang Delhi
In 2021 Dabang Delhi won by 37 points over Patna Pirates
```

To Replace NaN and null values

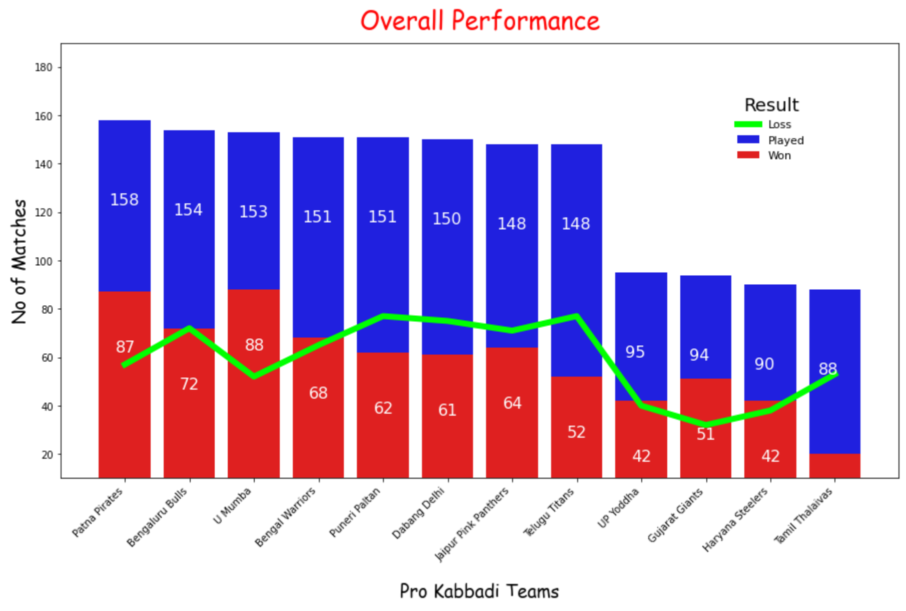
```python
df.fillna(1)
or
df.replace(np.nan,1)
```

Number of time a single team being in Finals

In [7]:
```python
df_finalist = (df_pkl_results['Winner'].value_counts()+df_pkl_results['Runner Up'].value_counts()).sort_values(ascending=False).replace(np.nan, 1)

plt.figure(figsize=(20,8))
sns.barplot(x=df_finalist.index, y=df_finalist.values, palette='viridis')
plt.xlabel("Pro Kabbadi Teams", fontsize=20, labelpad=20, family='cursive', color='orangered')
plt.xticks(fontsize=15, family='cursive', color='blueviolet')
plt.ylim(0,4.5)
plt.title("No of times a team being in Final", fontsize=25, pad=25, color='darkblue', weight=25, family='cursive', fontweight="bold")
for x,y in enumerate(df_finalist):
    plt.annotate(y, (x-0.1,y+.1), fontsize=17, family='cursive')
plt.show()
```



In [8]:
```python
df_overall = df[5]
df_overall.rename(columns={'Team[44]':"Team"}, inplace=True)
df_overall.drop(12, axis=0, inplace=True)

df_overall['Loss%'] = df_overall['Loss%'].str.split('%', expand=True).drop(1, axis=1)
df_overall['Win%'] = df_overall['Win%'].str.split('%', expand=True).drop(1, axis=1)
df_overall['Draw%'] = df_overall['Draw%'].str.split('%', expand=True).drop(1, axis=1)

# Changing Data Types
df_overall[['Win%', 'Loss%']]=df_overall[['Win%', 'Loss%']].astype(float)

df_overall.loc[:,'Played':'Draw']=df_overall.loc[:,'Played':'Draw'].astype(int)

#Plottinh
df_overall.sort_values(by='Played',ascending=False, inplace=True)
plt.figure(figsize=(15,8))
sns.barplot(x=df_overall['Team'], y=df_overall['Played'], label="Played", color='blue')
sns.barplot(x=df_overall['Team'], y=df_overall['Won'], label="Won", color='red')
sns.lineplot(x=df_overall['Team'], y=df_overall['Loss'], label="Loss", linewidth=6, color='lime')
plt.title("Overall Performance", family='cursive', fontsize=25, pad=15, color='red')
plt.xlabel('Pro Kabbadi Teams', fontsize=18, family='cursive', labelpad=20)
plt.ylabel('No of Matches', fontsize=18, family='cursive')
plt.xticks(rotation=45, ha='right')
plt.legend(frameon=False, fontsize=11,title= 'Result', title_fontsize=18, bbox_to_anchor=(0.9,0.9))# Frameon is outside box of legend
plt.ylim(10,190)
for x,y in enumerate(df_overall['Played']):
    plt.annotate(y, (x-0.25,y-35), fontsize=16, color='white')
for x,y in enumerate(df_overall['Won']):
    plt.annotate(y, (x-0.15,y-25), fontsize=16, color='white')
plt.show()
```



Maximum Trophies won by which Team?

In [9]:
```python
print('No of Trophies by a team','\n','-'*33)
df_overall['Trophy']=df_overall['Trophy'].astype(int)
print(df_overall[['Team','Trophy']].loc[df_overall['Trophy']>0].sort_values(by='Trophy',ascending=False))
```

```
No of Trophies by a team
 ---------------------------------
                   Team  Trophy
6          Patna Pirates       3
1        Bengaluru Bulls       1
10               U Mumba       1
0         Bengal Warriors      1
2            Dabang Delhi      1
5    Jaipur Pink Panthers      1
```

Total and Average points by a team.

Total Points

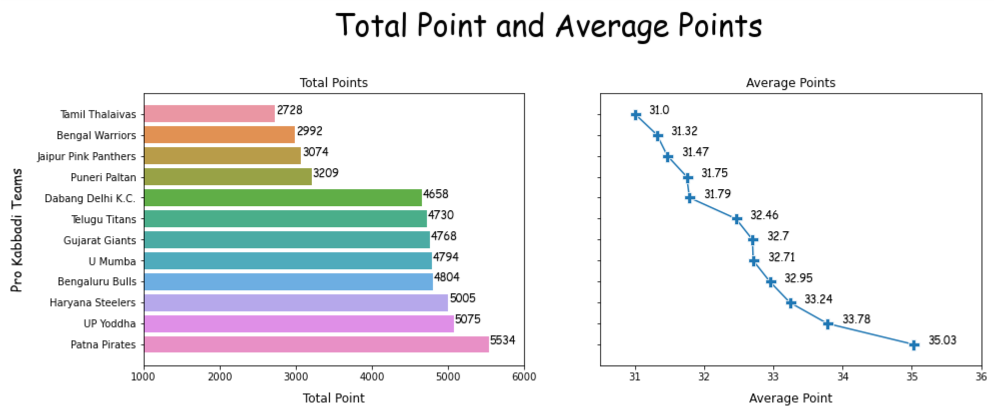
In [16]:
```python
df_total_points=df[7]
df_total_points.drop(['Unnamed: 4', 'Unnamed: 5'], axis=1, inplace=True)
df_total_points.drop(12, axis=0, inplace=True)
df_total_points.set_index('Rank',inplace=True)
df_total_points = df_total_points.astype({'Matches' : int, 'Total Points': int}).sort_values(by='Total Points', ascending=True)
```

Average Points

In [17]:
```python
df_average_points=df[9]
df_average_points.drop(['Unnamed: 4', 'Unnamed: 5'], axis=1, inplace=True)
df_average_points.drop(12, axis=0, inplace=True)
df_average_points.set_index('Rank',inplace=True)
df_average_points = df_average_points.astype({'Matches' : int, 'Average Points': float}).sort_values(by='Average Points', ascending=True)
```

Ploting

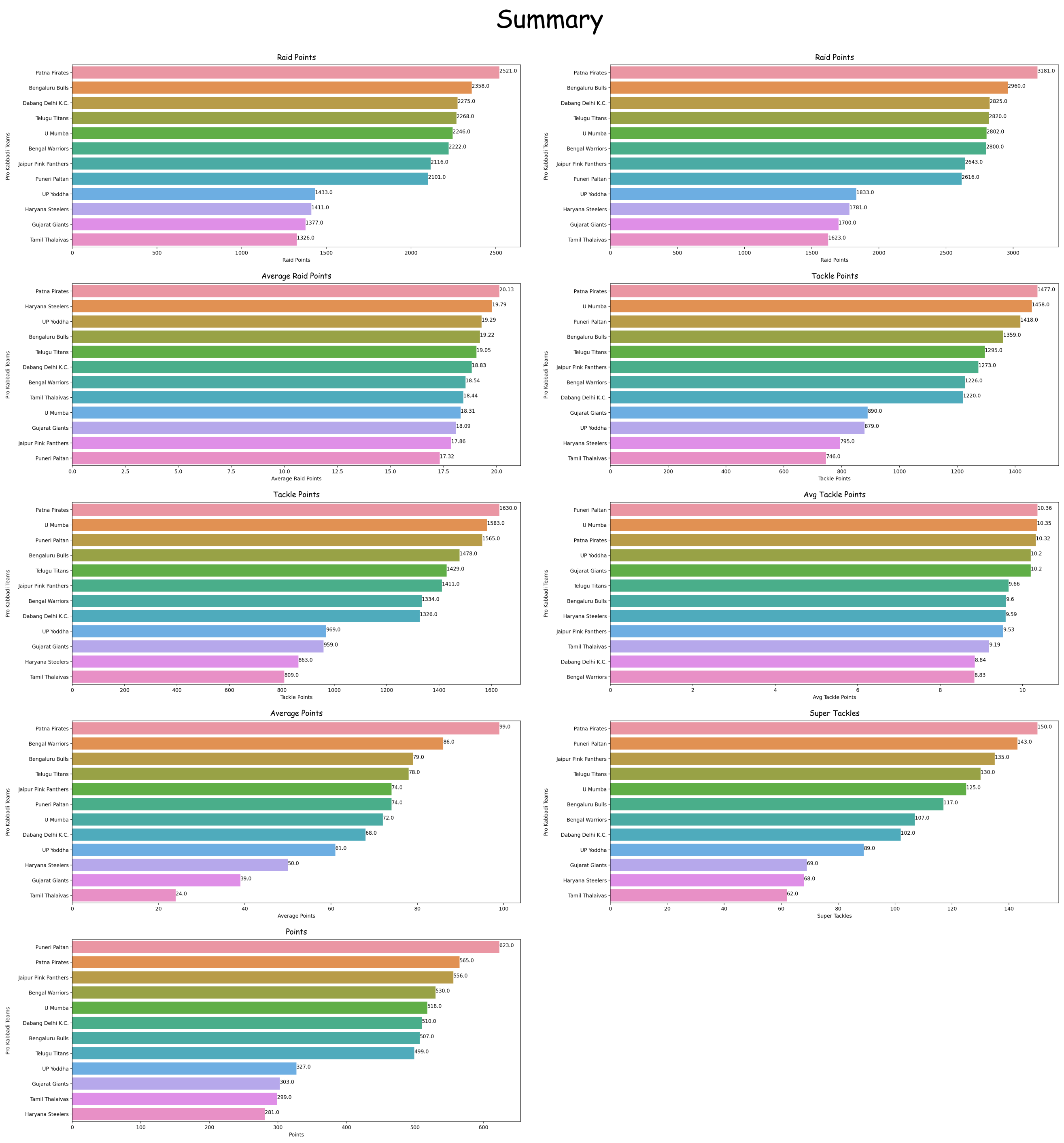
In [20]:
```python
fig, axes = plt.subplots(1,2, figsize=(15,5), sharey=True)
fig.suptitle("Total Point and Average Points", x=0.5, y=1.105,fontsize=30, family='cursive')
axes[0].set_title("Total Points")
axes[1].set_title("Average Points")
sns.barplot(ax=axes[0],y=df_total_points['Team'], x=df_total_points['Total Points'], orientation='horizontal')
sns.lineplot(ax=axes[1],y=df_average_points['Team'], x=df_average_points['Average Points'], marker='P', markersize=11)
axes[0].set_xlabel("Total Point", fontsize=12, labelpad=10)
axes[0].set_ylabel("Pro Kabbadi Teams", fontsize=14, labelpad=10, family='cursive')
axes[1].set_xlabel("Average Point", fontsize=12, labelpad=10)
axes[0].set_xlim(1000,6000)
axes[1].set_xlim(30.5,36)
for x,y in enumerate(df_average_points['Average Points']):
    axes[1].annotate(y,(y+.2,x), family='cursive', fontsize=11)
for x,y in enumerate(df_total_points['Total Points']):
    axes[0].annotate(y,(y+10,x), family='cursive', fontsize=11)
plt.show()
```



Ploting all graphs related to teams

In [7]:
```python
df_succesful_raids = df[10]
df_raid_points = df[11]
df_avg_raid_points = df[12]
df_succesful_tackles = df[13]
df_tackle_points = df[14]
df_avg_tackle_points = df[15]
df_super_raids = df[16]
df_super_tackles = df[17]
df_do_or_die = df[18]

tab=[df_succesful_raids,df_raid_points, df_avg_raid_points, df_succesful_tackles,df_tackle_points, df_avg_tackle_points,df_super_raids,df_super_tackles,df_do_or_die]
col=['Raid Points', 'Raid Points','Average Raid Points', 'Tackle Points', 'Tackle Points', 'Avg Tackle Points', 'Average Points','Super Tackles','Points']

for i,j in zip(range(9),range(9)):
    tab[i].drop(['Unnamed: 4', 'Unnamed: 5'], axis=1, inplace=True)
    tab[i].drop(12, axis=0, inplace=True)
    tab[i].set_index('Rank',inplace=True)
    tab[i] = tab[i].astype({'Matches' : int, col[j]: float}).sort_values(by=col[j], ascending=False)
```

In [88]:
```python
plt.figure(figsize=(35,35), dpi=200)
plt.suptitle("Summary", fontsize=50, family='cursive', x=.5,y=0.925)
for k in range(9):
    plots=k
    plt.subplot(5,2,plots+1)
    sns.barplot(y=tab[k]['Team'], x=tab[k][col[k]], orientation='horizontal')
    plt.title(col[k], fontsize=15, family='cursive', pad=10)
    plt.ylabel("Pro Kabbadi Teams", labelpad=15)
    for x,y in enumerate(tab[k][col[k]]):
        plt.annotate(y,(y,x))

plt.subplots_adjust(bottom=.05)
plt.savefig("Summary.jpg")
```



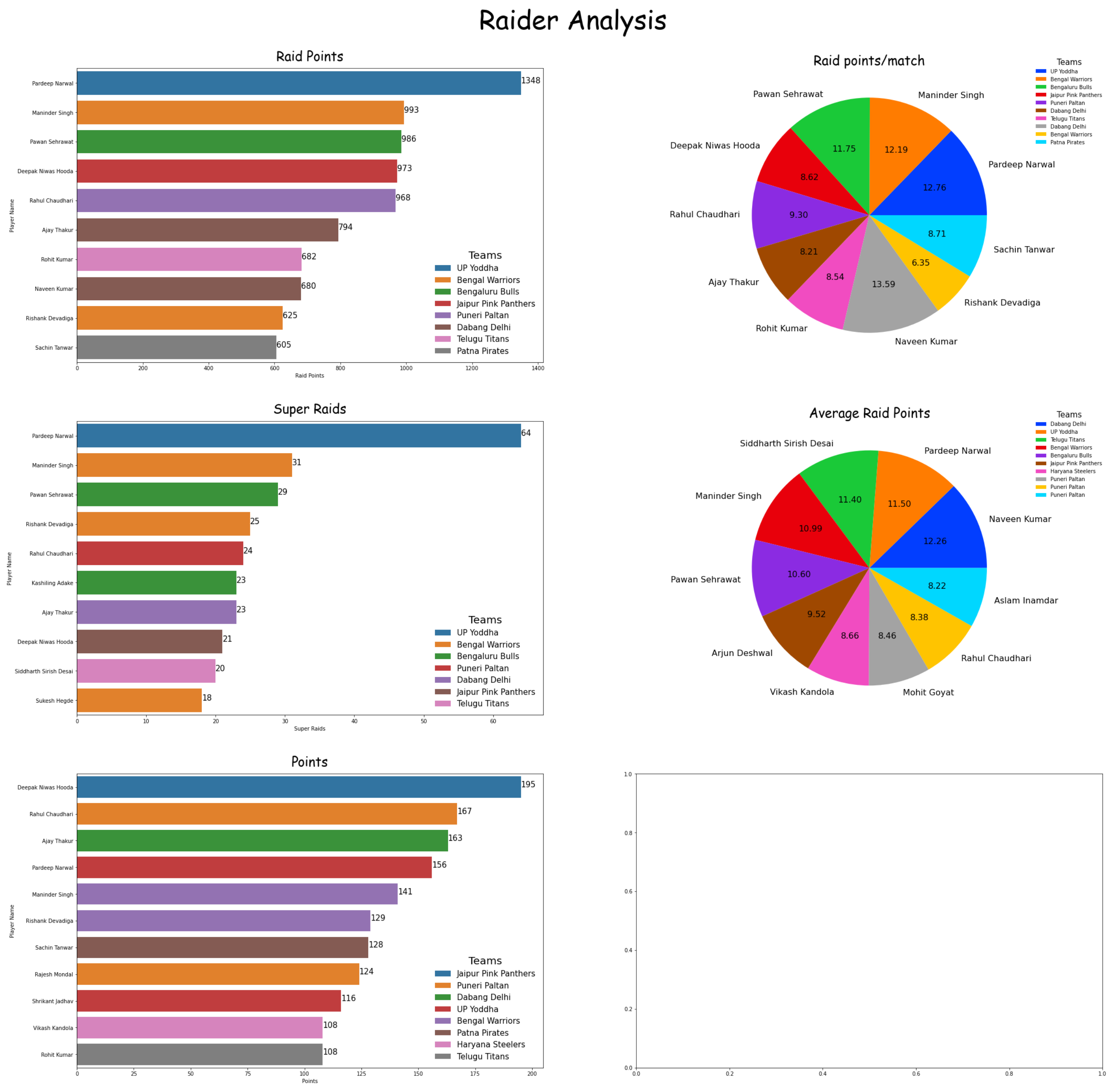
Players Analysis

Raider Analysis

In [152]:

```
df_most_raid_points = df[22]
df_avg_raid_points = df[24]
df_super_raids = df[25]
df_do_or_die_points = df[26]
df_super_10s = df[27]

df_most_raid_points.drop(10, axis=0, inplace=True)
df_avg_raid_points=df_avg_raid_points.drop(10, axis=0).drop('Unnamed: 5', axis=1)
df_super_raids=df_super_raids.drop(10, axis=0).drop('Unnamed: 5', axis=1)
df_do_or_die_points=df_do_or_die_points.drop(11, axis=0).drop('Unnamed: 5', axis=1)
df_super_10s.drop(10,axis=0, inplace=True)
df_most_raid_points.rename(columns={'Player': 'Player Name'}, inplace=True)

dfsd=[df_most_raid_points,df_avg_raid_points,df_super_raids,df_do_or_die_points,df_super_10s]

for i in range(len(dfsd)):
    dfsd[i].set_index('Rank', inplace=True)

df_int= [df_most_raid_points,df_super_raids,df_do_or_die_points,df_super_10s]
for_int=['Raid Points','Super Raids','Points','Super 10s' ]

for i,j in zip(range(len(df_int)),range(len(df_int))):
    df_int[i][for_int[j]]=df_int[i][for_int[j]].astype(int)

df_float=[df_most_raid_points,df_avg_raid_points]
for_float=['Raid points/match','Average Raid Points' ]

for i,j in zip(range(len(df_float)),range(len(df_float))):
    df_float[i][for_float[j]]=df_float[i][for_float[j]].astype(float)
```

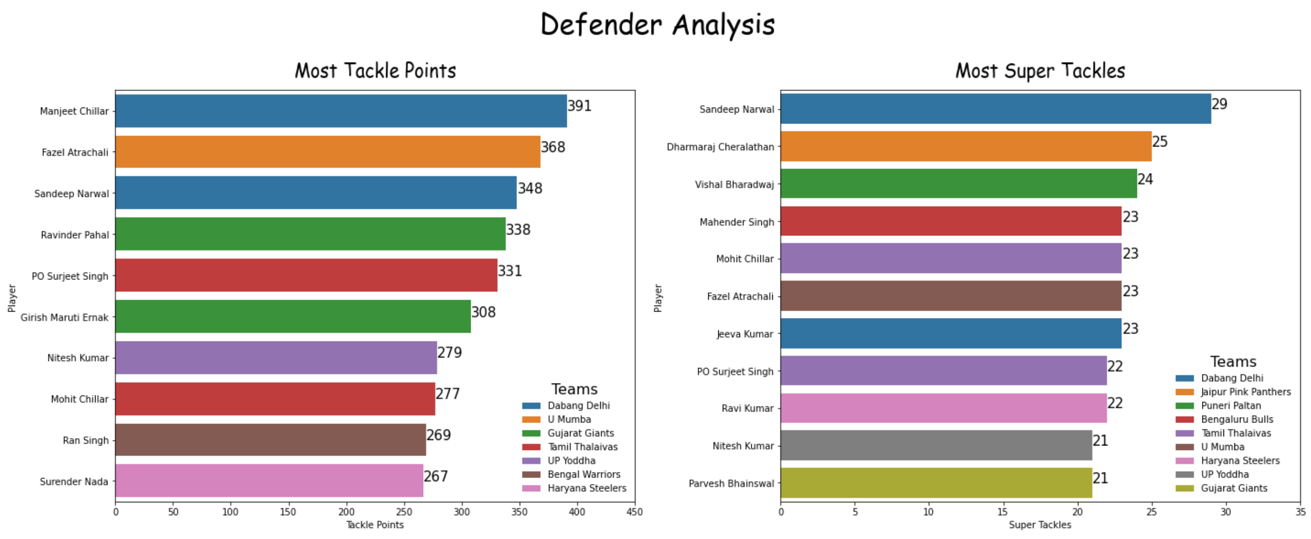
In [173]:
```python
plt.figure(figsize=(35,35))
plt.suptitle("Raider Analysis", fontsize=50, x=0.5, y=.925, family='cursive')
plots=0
for i in range(len(df_int)):
    try:
        plt.subplot(3,2,plots+1)
        sns.barplot(x=df_int[i][for_int[i]], y=df_int[i]['Player Name'], hue=df_int[i]['Current Team'], dodge=False)
        plt.title(for_int[i], fontsize=25, family='cursive', pad=15)
        plt.legend(loc='lower right',fontsize=15, title='Teams', title_fontsize=20, frameon = False)
        plots=plots+1
        for x, y in enumerate(df_int[i][for_int[i]]):
            plt.annotate(y,(y,x), fontsize=15)
    except Exception:
        print("")

    try:
        plt.subplot(3,2,plots+1)
        plots=plots+1
        colors=sns.color_palette('bright')
        labels=df_float[i]['Player Name']
        data=df_float[i][for_float[i]]
        plt.pie(data, labels=labels, colors=colors,autopct = '%.2f', textprops={'fontsize':16})
        plt.legend(df_float[i]['Current Team'],bbox_to_anchor=(1.05,1.05), loc='upper left',title='Teams', title_fontsize=15, frameon = False )
        plt.title(for_float[i], fontsize=25, family='cursive')
    except Exception:
        print('')

```



Defenders Analysis

In [107]:
```python
df_most_tackle_points=df[28]
df_avg_tackle_points = df[30]
df_most_super_tackles =df[31]
df_most_high5s =df[32]

df_most_tackle_points = df_most_tackle_points.drop(10, axis=0).astype({'Matches': int, 'Tackle Points': int, 'Points/match':float})
df_avg_tackle_points = df_avg_tackle_points.drop(10, axis=0).drop('Unnamed: 5', axis=1).astype({'Matches': int, 'Average Tackle Points': float})
df_most_super_tackles = df_most_super_tackles.drop(11, axis=0).drop('Unnamed: 5', axis=1).astype({'Matches': int, 'Super Tackles': int})
df_most_high5s = df_most_high5s.drop(11, axis=0).astype({'Match Played': int, 'High 5s': int, 'Match/high 5s':float})

```

In [176]:
```python
plt.figure(figsize=(20,8))
title=["Most Tackle Points","Most Super Tackles"]
points=['Tackle Points','Super Tackles']
df_s = [df_most_tackle_points, df_most_super_tackles]
xlimm=[450,35]
plt.suptitle("Defender Analysis", fontsize=30, family='cursive', x=0.5, y=1)
for i in range(len(df_s)):
    plt.subplot(1,2,i+1)
    sns.barplot(x= df_s[i][points[i]], y=df_s[i]['Player'], hue=df_s[i]['Current Team'], dodge=False)
    plt.xlim(0,xlimm[i])
    plt.title(title[i], fontsize=20, family='cursive',pad=15)
    plt.legend(frameon=False, title="Teams", title_fontsize=16)
    for x,y in enumerate(df_s[i][points[i]]):
        plt.annotate(y, (y,x), fontsize=15)

plt.tight_layout()
```



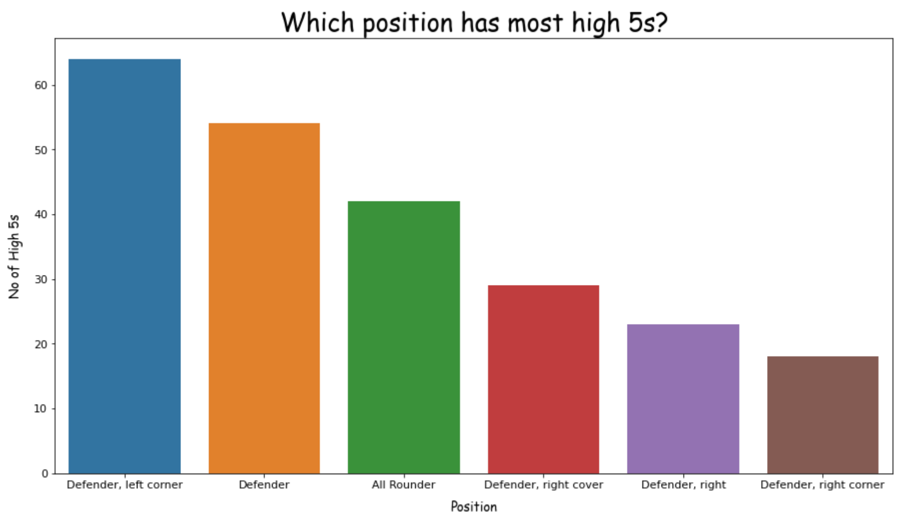
In [191]:
```python
high5_grp = df_most_high5s.groupby('Position').sum().sort_values(by='High 5s', ascending= False)
high5_grp
```

Out[191]:

Position	Match Played	High 5s	Match/high 5s
Defender, left corner	342	64	16.06
Defender	256	54	14.25
All Rounder	281	42	14.04
Defender, right cover	114	29	3.93
Defender, right	120	23	5.21
Defender, right corner	109	18	6.05

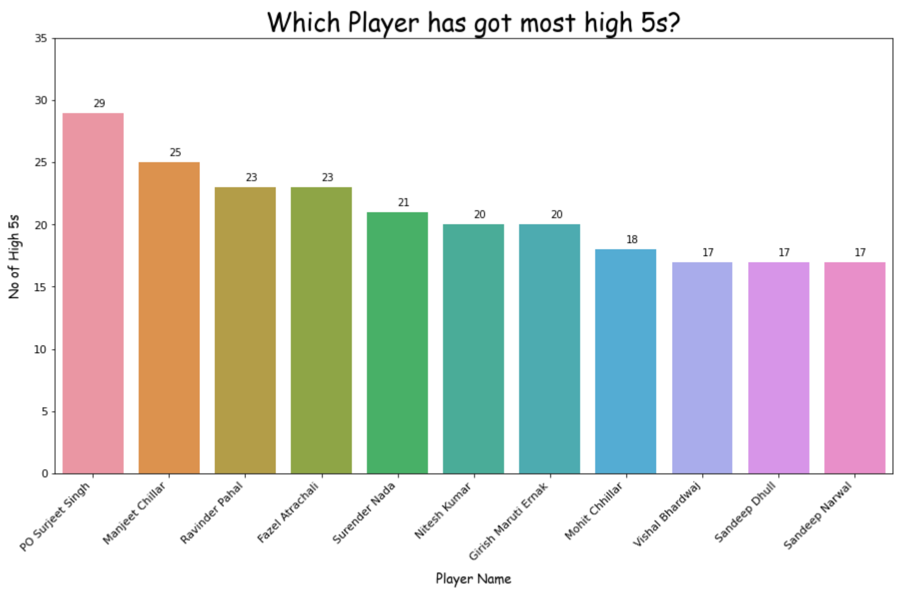
In [202]:
```python
plt.figure(figsize=(15,8))
sns.barplot(x=high5_grp.index, y=high5_grp['High 5s'])
plt.title("Which position has most high 5s?", fontsize=25, family='cursive')
plt.tick_params(axis='both', labelsize=11)
plt.xlabel("Position", fontsize=13, family='cursive', labelpad=10)
plt.ylabel("No of High 5s", fontsize=13, family='cursive', labelpad=10)
```

Out[202]:
```
Text(0, 0.5, 'No of High 5s')
```



In [212]:

```python
plt.figure(figsize=(15,8))
sns.barplot(x=df_most_high5s['Player Name'], y=df_most_high5s['High 5s'])
plt.title("Which Player has got most high 5s?", fontsize=25, family='cursive')
plt.tick_params(axis='both', labelsize=11)
plt.xlabel("Player Name", fontsize=13, family='cursive', labelpad=10)
plt.ylabel("No of High 5s", fontsize=13, family='cursive', labelpad=10)
plt.xticks(rotation=45, ha= 'right')
plt.ylim(0,35)
for x, y in enumerate(df_most_high5s['High 5s']):
    plt.annotate(y,(x,y+0.5))
plt.show()
```



In [ ]:

```python

```