In [1]:

```python
import numpy as np
import pandas as pd
import os
import warnings
warnings.filterwarnings("ignore")
```

In [2]:

```python
df = pd.read_csv("D:\Data Science\Projects\IPL Analysis\iplauction2023.csv")
df
```

Out[2]:

	name	player style	nationality	base price (in lacs)	final price (in lacs)	franchise	status
0	Harshit Rana	Bowler	India	NaN	20.0	KKR	RETAINED
1	Ekant Sen	Batter	India	20.0	NaN	NaN	UNSOLD
2	Wayne Parnell	Allrounder	South Africa	75.0	NaN	NaN	UNSOLD
3	Shakib Al Hasan	Allrounder	Bangladesh	150.0	150.0	KKR	SOLD
4	Joe Root	Batter	England	100.0	100.0	RR	SOLD
...	...	...	...	...	...	...	...
304	MS Dhoni	WK-Batter	India	NaN	1200.0	CSK	RETAINED
305	Moeen Ali	Allrounder	England	NaN	800.0	CSK	RETAINED
306	Ruturaj Gaikwad	Batter	India	NaN	600.0	CSK	RETAINED
307	Rishabh Pant	WK-Batter	India	NaN	1600.0	DC	RETAINED
308	Axar Patel	Allrounder	India	NaN	900.0	DC	RETAINED

309 rows × 7 columns

EDA

In [3]:

```
df.head()
```

Out[3]:

	name	player style	nationality	base price (in lacs)	final price (in lacs)	franchise	status
0	Harshit Rana	Bowler	India	NaN	20.0	KKR	RETAINED
1	Ekant Sen	Batter	India	20.0	NaN	NaN	UNSOLD
2	Wayne Parnell	Allrounder	South Africa	75.0	NaN	NaN	UNSOLD
3	Shakib Al Hasan	Allrounder	Bangladesh	150.0	150.0	KKR	SOLD
4	Joe Root	Batter	England	100.0	100.0	RR	SOLD

In [4]:

```
df.describe()
```

Out[4]:

	base price (in lacs)	final price (in lacs)
count	151.000000	238.000000
mean	59.205298	368.067227
std	59.688337	449.070117
min	20.000000	20.000000
25%	20.000000	21.250000
50%	20.000000	150.000000
75%	75.000000	625.000000
max	200.000000	1850.000000

In [5]:

```
df.shape
```

Out[5]:

```
(309, 7)
```

In [6]:
```
df.isna().sum()
```

Out[6]:
```
name                      0
player style              0
nationality               0
base price (in lacs)    158
final price (in lacs)    71
franchise                71
status                    0
dtype: int64
```

In [7]:
```
df
```

Out[7]:

	name	player style	nationality	base price (in lacs)	final price (in lacs)	franchise	status
0	Harshit Rana	Bowler	India	NaN	20.0	KKR	RETAINED
1	Ekant Sen	Batter	India	20.0	NaN	NaN	UNSOLD
2	Wayne Parnell	Allrounder	South Africa	75.0	NaN	NaN	UNSOLD
3	Shakib Al Hasan	Allrounder	Bangladesh	150.0	150.0	KKR	SOLD
4	Joe Root	Batter	England	100.0	100.0	RR	SOLD
...	...	...	...	...	...	...	...
304	MS Dhoni	WK-Batter	India	NaN	1200.0	CSK	RETAINED
305	Moeen Ali	Allrounder	England	NaN	800.0	CSK	RETAINED
306	Ruturaj Gaikwad	Batter	India	NaN	600.0	CSK	RETAINED
307	Rishabh Pant	WK-Batter	India	NaN	1600.0	DC	RETAINED
308	Axar Patel	Allrounder	India	NaN	900.0	DC	RETAINED

309 rows × 7 columns

In [8]:

```python
df['final price (in lacs)'].sum
```

Out[8]:

```
<bound method Series.sum of 0        20.0
1          NaN
2          NaN
3        150.0
4        100.0
         ...  
304     1200.0
305      800.0
306      600.0
307     1600.0
308      900.0
Name: final price (in lacs), Length: 309, dtype: float64>
```

In [9]:

```python
df['name'].dtype
```

Out[9]:

```
dtype('O')
```

In [10]:

```python
df['final price (in lacs)'].dtype
```

Out[10]:

```
dtype('float64')
```

In [11]:

```python
df.loc[df.duplicated(subset = ['name'])]
```

Out[11]:

name	player style	nationality	base price (in lacs)	final price (in lacs)	franchise	status

In [12]:

```python
df.columns
```

Out[12]:

```
Index(['name', 'player style', 'nationality', 'base price (in lacs)',
       'final price (in lacs)', 'franchise', 'status'],
      dtype='object')
```

In [13]:

```
m =df['player style'].value_counts()
m
```

Out[13]:

```
player style
Bowler        111
Allrounder    103
Batter         55
WK-Batter      40
Name: count, dtype: int64
```

In [14]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 309 entries, 0 to 308
Data columns (total 7 columns):
 #   Column                Non-Null Count  Dtype  
---  ------                --------------  -----  
 0   name                  309 non-null    object 
 1   player style          309 non-null    object 
 2   nationality           309 non-null    object 
 3   base price (in lacs)  151 non-null    float64
 4   final price (in lacs) 238 non-null    float64
 5   franchise             238 non-null    object 
 6   status                309 non-null    object 
dtypes: float64(2), object(5)
memory usage: 17.0+ KB
```

In [15]:

```python
from pandas.api.types import is_numeric_dtype

for col in df.columns:
    if is_numeric_dtype(df[col]):
        print('\nColumn: %s' % col)
        print('\tMean = %.2f' % df[col].mean())
        print('\tStandard deviation = %.2f' % df[col].std())
        print('\tMinimum = %.2f' % df[col].min())
        print('\tMaximum = %.2f' % df[col].max())
```

```
Column: base price (in lacs)
        Mean = 59.21
        Standard deviation = 59.69
        Minimum = 20.00
        Maximum = 200.00

Column: final price (in lacs)
        Mean = 368.07
        Standard deviation = 449.07
        Minimum = 20.00
        Maximum = 1850.00
```

In [16]:

```python
df.isnull().sum( )
```

Out[16]:

```
name                      0
player style              0
nationality               0
base price (in lacs)    158
final price (in lacs)    71
franchise                71
status                    0
dtype: int64
```

In [17]:

```python
duplicates = df[df.duplicated()]
print("Number of duplicates: " ,len (duplicates) )
```

```
Number of duplicates:  0
```

In [18]:

```
df.describe()
```

Out[18]:

	base price (in lacs)	final price (in lacs)
count	151.000000	238.000000
mean	59.205298	368.067227
std	59.688337	449.070117
min	20.000000	20.000000
25%	20.000000	21.250000
50%	20.000000	150.000000
75%	75.000000	625.000000
max	200.000000	1850.000000

In [19]:

```
df.dtypes
```

Out[19]:

```
name                    object
player style            object
nationality             object
base price (in lacs)   float64
final price (in lacs)  float64
franchise               object
status                  object
dtype: object
```

In [39]:

```
df_corr = df.select_dtypes(include=[float, int]).corr()
df_corr
```

Out[39]:

	base price (in lacs)	final price (in lacs)
base price (in lacs)	1.000000	0.667296
final price (in lacs)	0.667296	1.000000

In [21]:
```
df.nunique()
```

Out[21]:
```
name                    309
player style              4
nationality              14
base price (in lacs)      8
final price (in lacs)    67
franchise                10
status                    3
dtype: int64
```

In [22]:
```
df["nationality"].value_counts()
```

Out[22]:
```
nationality
India           201
England          24
South Africa     19
West Indies      14
Australia        14
New Zealand      11
Sri Lanka         8
Afghanistan       7
Bangladesh        4
Ireland           2
Zimbabwe          2
Namibia           1
Netherlands       1
Singapore         1
Name: count, dtype: int64
```

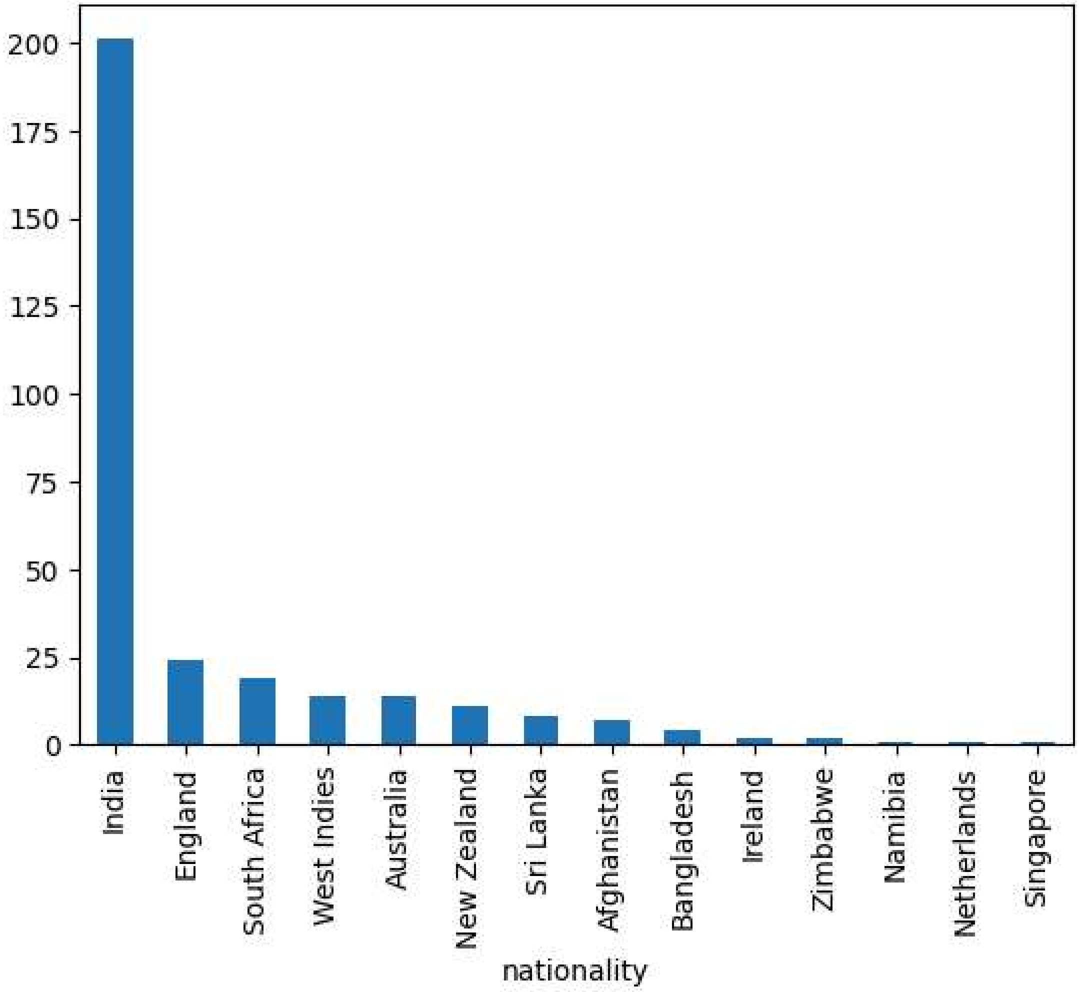
In [23]:
```
df.columns
```

Out[23]:
```
Index(['name', 'player style', 'nationality', 'base price (in lacs)',
       'final price (in lacs)', 'franchise', 'status'],
      dtype='object')
```

VISUALIZATION

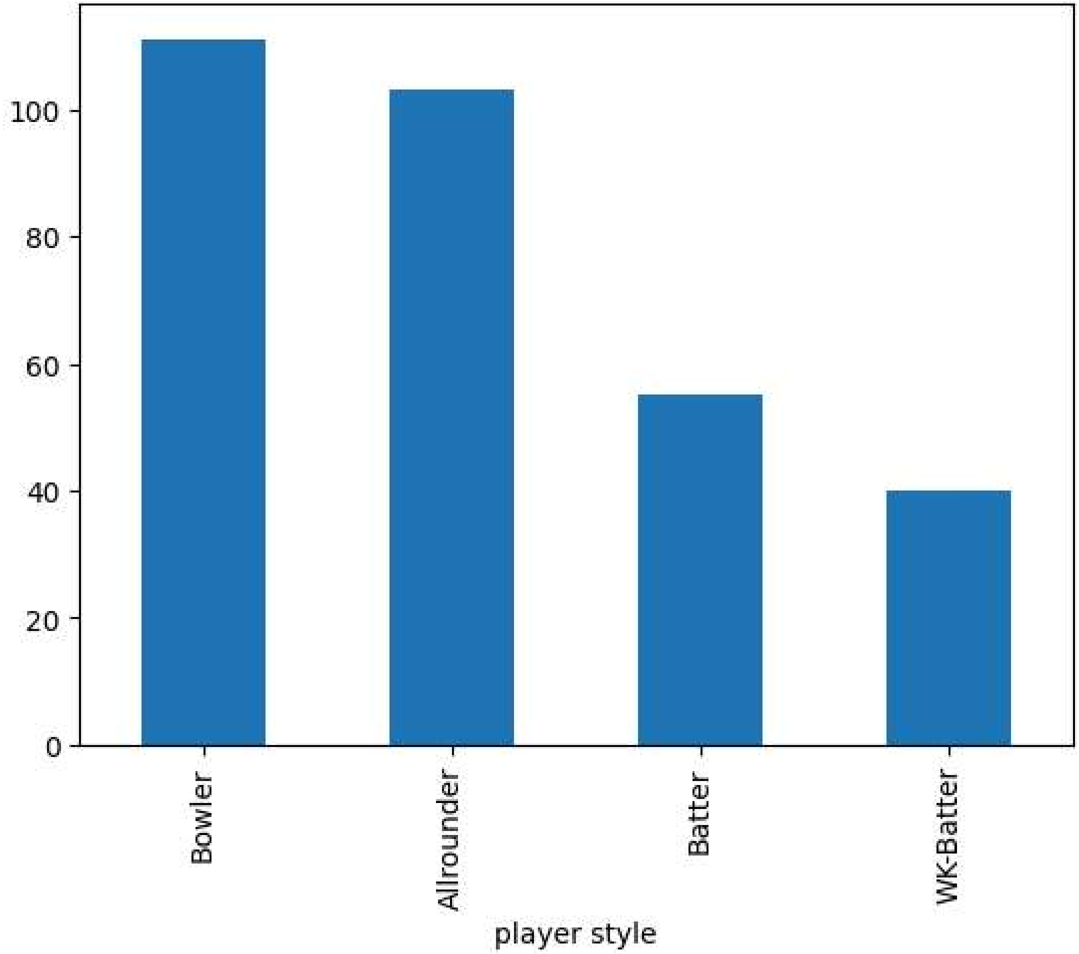
In [24]:

```
import matplotlib.pyplot as plt
df["nationality"].value_counts().plot(kind = 'bar')
plt.show()
```



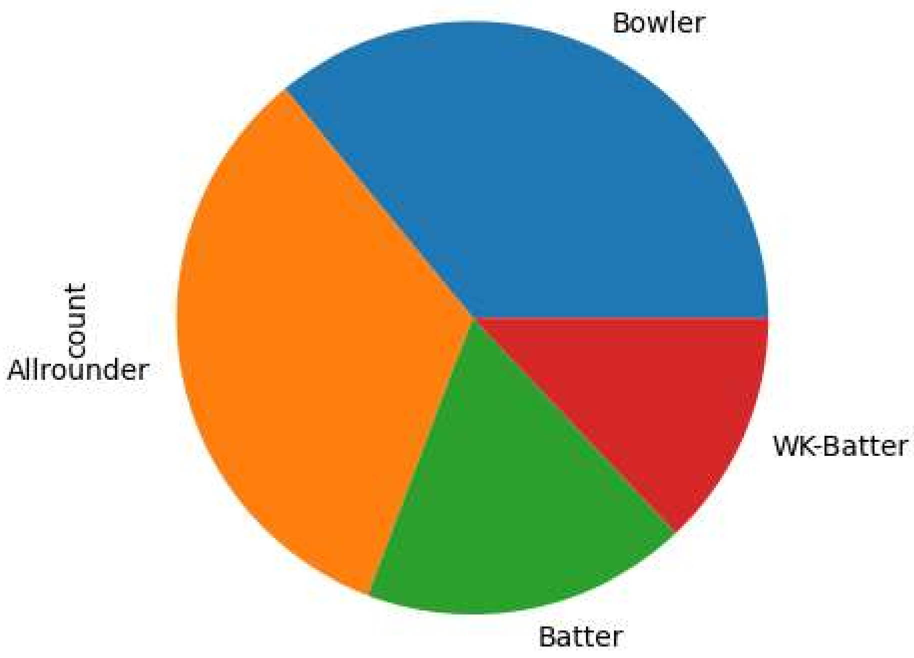
In [25]:

```
import matplotlib.pyplot as plt
df["player style"].value_counts().plot(kind = 'bar')
plt.show()
```



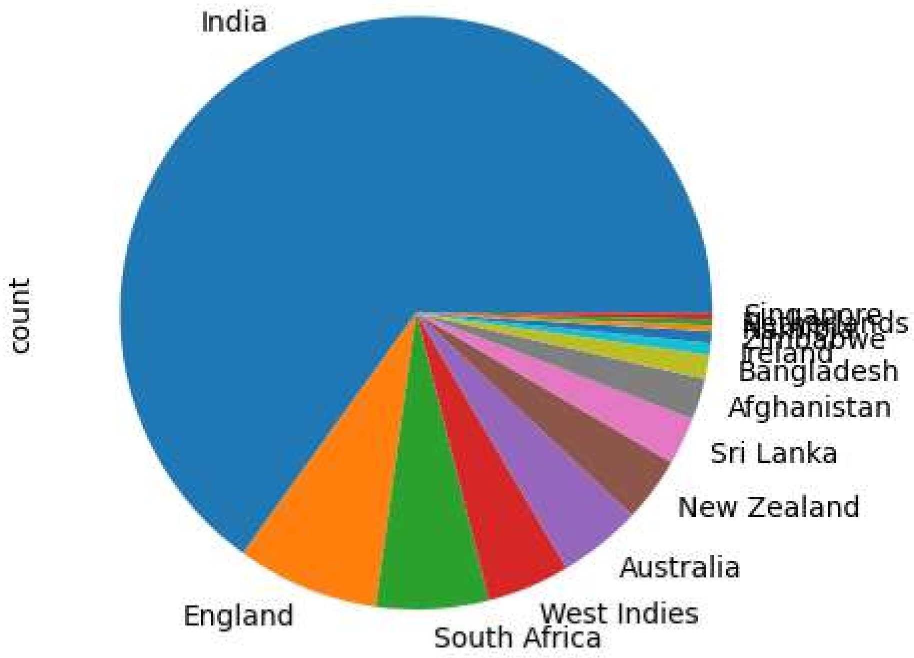
In [26]:

```
df["player style"].value_counts().plot(kind = 'pie')
plt.show()
```



In [27]:

```python
df["nationality"].value_counts().plot(kind = 'pie')
plt.show()
```



In [28]:

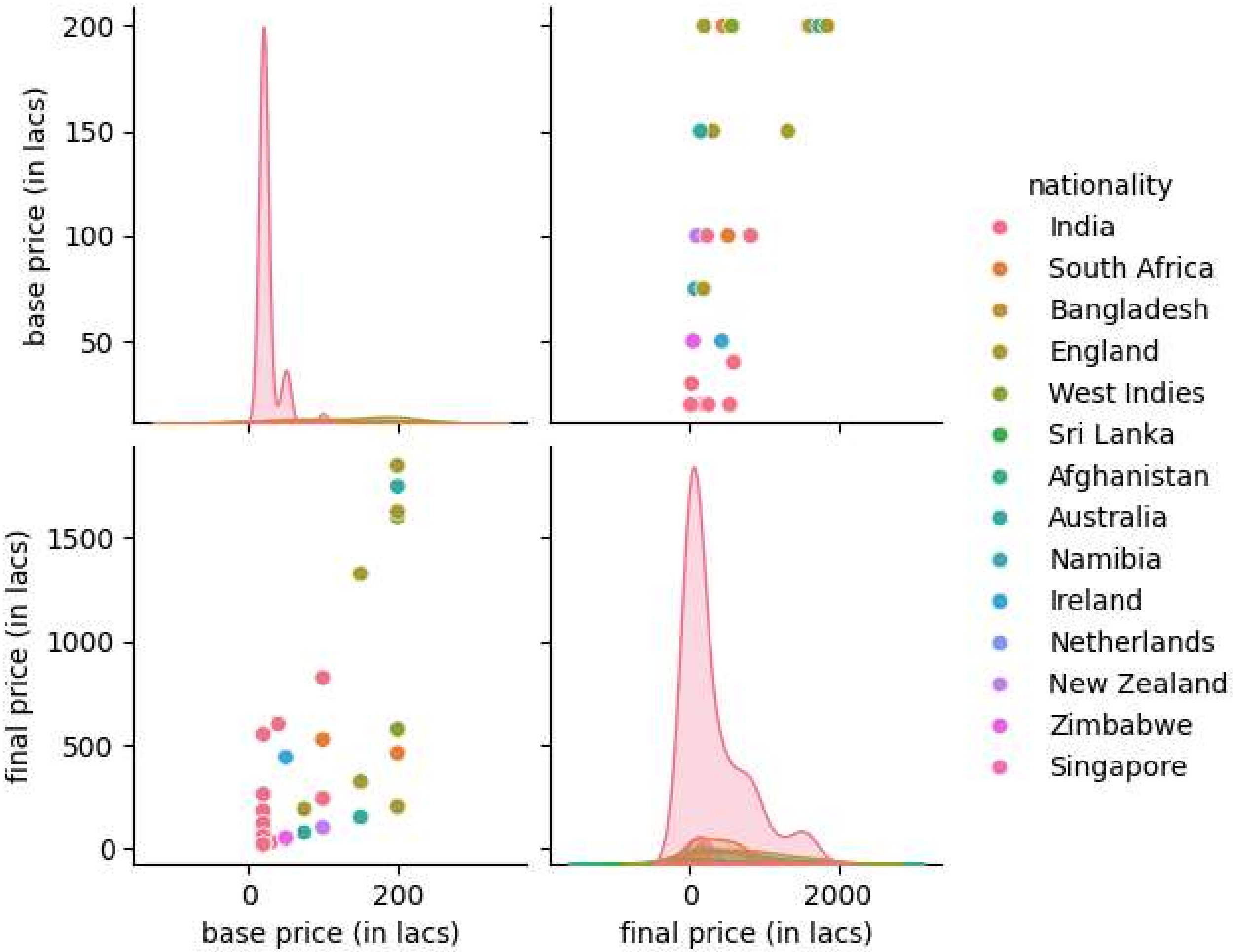
```python
df.keys()
```

Out[28]:

```
Index(['name', 'player style', 'nationality', 'base price (in lacs)',
       'final price (in lacs)', 'franchise', 'status'],
      dtype='object')
```

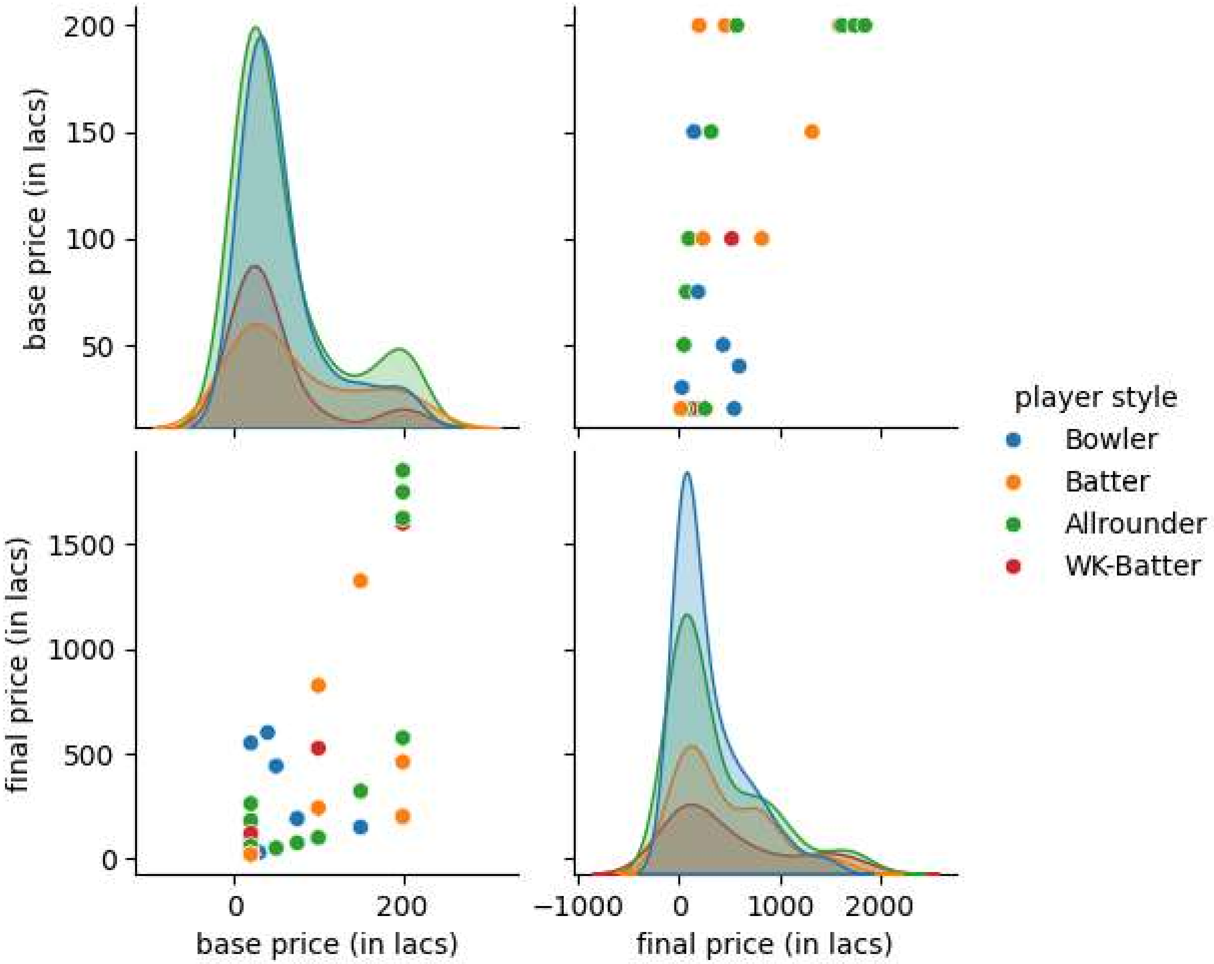
In [29]:

```
# visualize the whole dataset
import seaborn as sns
sns.pairplot(df, hue="nationality")
plt.show()
```



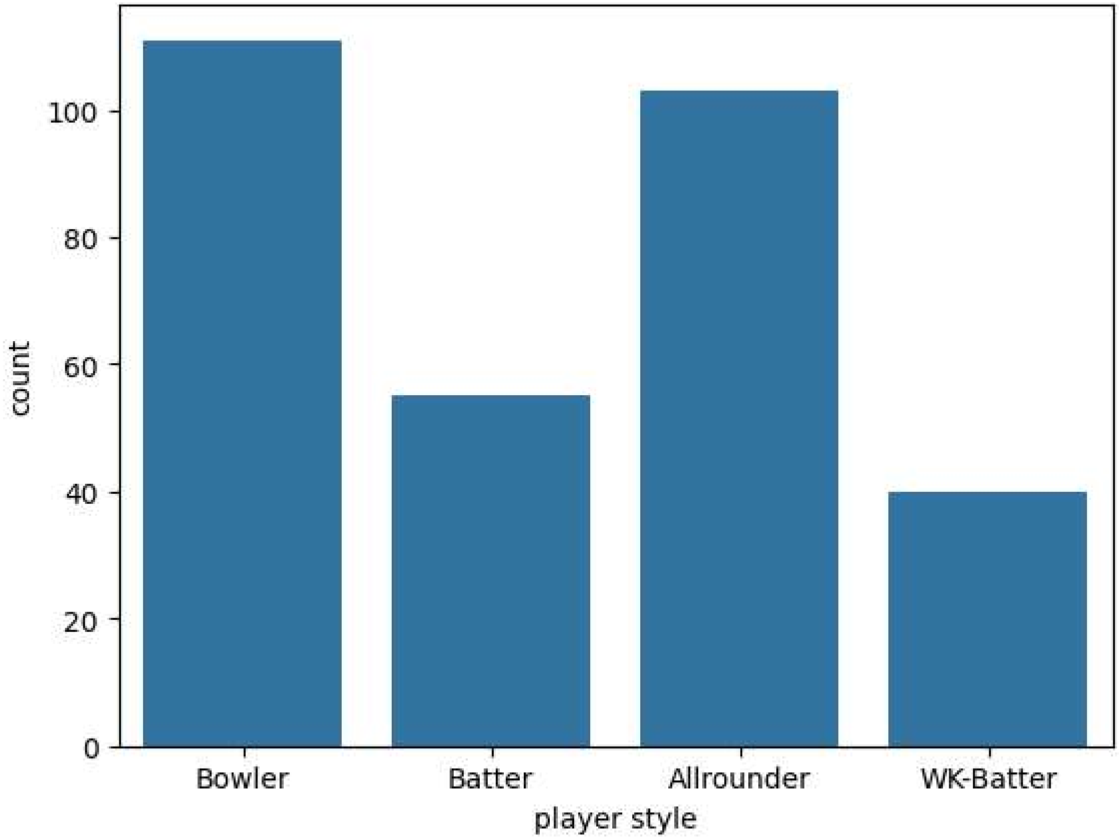
In [30]:

```
sns.pairplot(df, hue="player style")
plt.show()
```



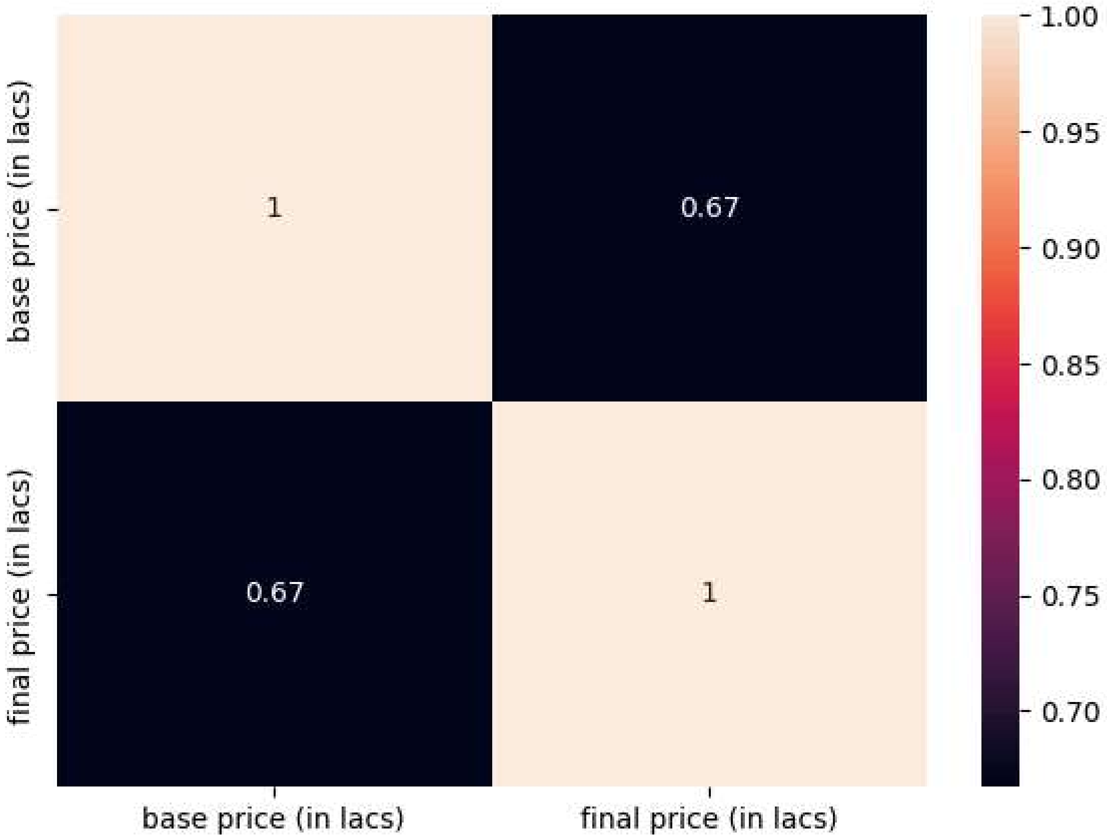
In [31]:

```
sns.countplot(x='player style', data=df)
plt.show()
```



In [40]:

```
plt.figure(figsize=(7, 5))
sns.heatmap(df_corr, annot=True)
plt.show()
```



In [41]:

```
g1=df.groupby('player style')['base price (in lacs)'].mean().idxmax()
g2=df.groupby('player style')['base price (in lacs)'].mean().max()
g3=df.groupby('player style')['base price (in lacs)'].mean().idxmin()
g4=df.groupby('player style')['base price (in lacs)'].mean().min()

print(f'The playing style {g1} has a the highest base price on average of {round(g2,2)} lacs ')
print(f'The playing style {g3} has a the lowest base price on average of {round(g4,2)} lacs ')
```

```
The playing style Batter has a the highest base price on average of 75.65 lacs
The playing style WK-Batter has a the lowest base price on average of 45.24 lacs
```

FRANCHISE ANALYSIS

In [42]:

```
grp=df.groupby('franchise')['final price (in lacs)'].sum()
grp
```

Out[42]:

```
franchise
CSK      9350.0
DC       8685.0
GT       9055.0
KKR      6410.0
LSG      9065.0
MI       9420.0
PBKS     8280.0
RCB      9325.0
RR       9165.0
SRH      8845.0
Name: final price (in lacs), dtype: float64
```

In [43]:

```
grp1=df.groupby('franchise')['final price (in lacs)'].mean().sort_values().reset_index()
grp1
```

Out[43]:

	franchise	final price (in lacs)
0	KKR	337.368421
1	SRH	353.800000
2	DC	361.875000
3	GT	362.200000
4	LSG	362.600000
5	RR	366.600000
6	RCB	373.000000
7	CSK	374.000000
8	PBKS	376.363636
9	MI	409.565217

In [44]:

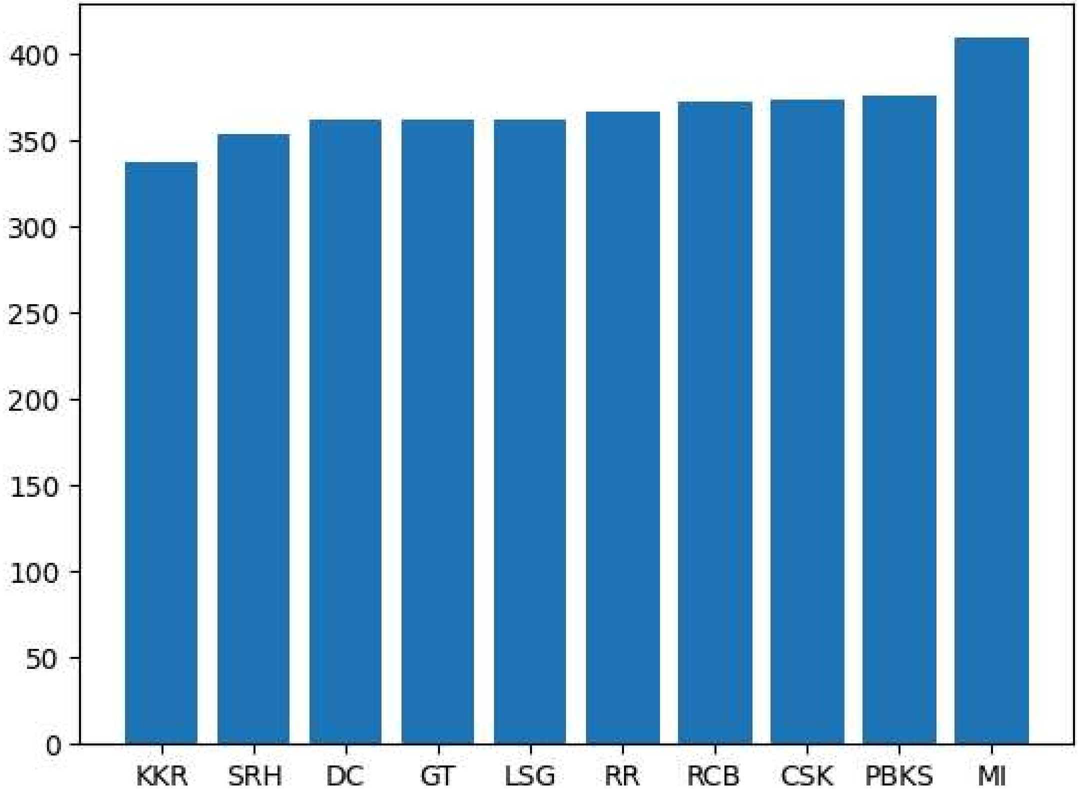
```
grp1['franchise'].values
```

Out[44]:

```
array(['KKR', 'SRH', 'DC', 'GT', 'LSG', 'RR', 'RCB', 'CSK', 'PBKS', 'MI'],
      dtype=object)
```

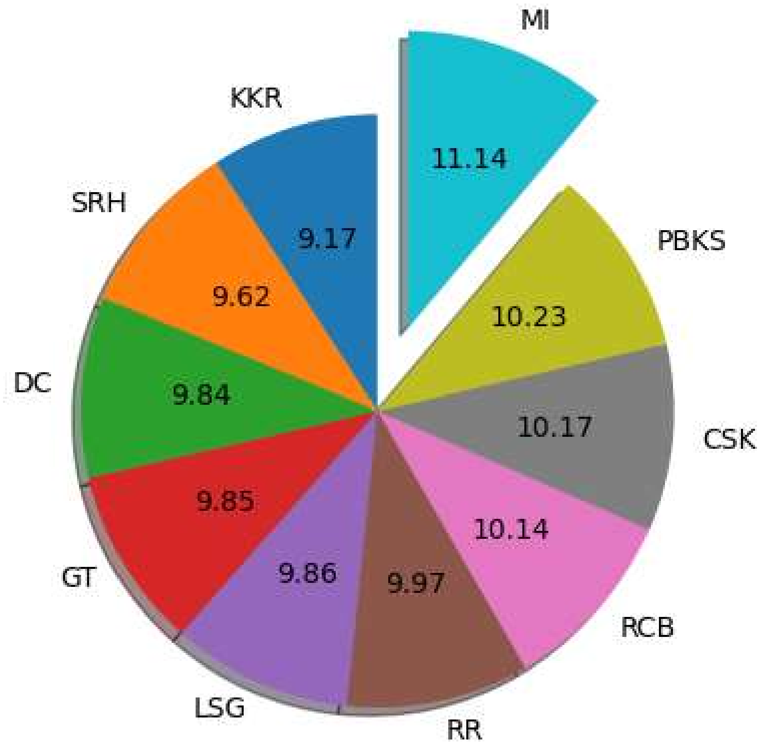
In [45]:

```
plt.bar(grp1['franchise'],grp1['final price (in lacs)'])
plt.show()
```



In [46]:

```
plt.pie(grp1['final price (in lacs)'],labels=['KKR', 'SRH', 'DC', 'GT', 'LSG', 'RR', 'RCB', 'CSK', 'PBKS'
plt.show()
```



In [47]:

```python
import pandas as pd

# Assuming df is your DataFrame containing data about statuses and franchises

# Grouping by 'status' and 'franchise', and counting occurrences
st = df.groupby('status')['franchise'].value_counts()

# Selecting counts for 'RETAINED' status
st1 = st.loc['RETAINED']

# Finding the maximum count of franchises for 'RETAINED' status
max_count = st1.max()

print("Maximum count of franchises for 'RETAINED' status:", max_count)

```

```
Maximum count of franchises for 'RETAINED' status: 19
```

PLAYER PRICE ANALYSIS

In [48]:

```
nat=df.groupby('nationality')[['base price (in lacs)','final price (in lacs)']].mean().reset_index()
nat
```

Out[48]:

	nationality	base price (in lacs)	final price (in lacs)
0	Afghanistan	67.500000	407.500000
1	Australia	136.428571	591.818182
2	Bangladesh	83.333333	133.333333
3	England	136.470588	745.666667
4	India	25.444444	323.456790
5	Ireland	50.000000	440.000000
6	Namibia	100.000000	100.000000
7	Netherlands	20.000000	NaN
8	New Zealand	160.000000	221.250000
9	Singapore	NaN	825.000000
10	South Africa	91.875000	360.333333
11	Sri Lanka	50.000000	303.750000
12	West Indies	114.285714	472.500000
13	Zimbabwe	50.000000	50.000000

In [49]:

```
df[df['nationality']=='Australia']
```

Out[49]:

	name	player style	nationality	base price (in lacs)	final price (in lacs)	franchise	status
23	Adam Zampa	Bowler	Australia	150.0	150.0	RR	SOLD
85	Riley Meredith	Bowler	Australia	150.0	NaN	NaN	UNSOLD
89	Daniel Sams	Allrounder	Australia	75.0	75.0	LSG	SOLD
93	Travis Head	Allrounder	Australia	200.0	NaN	NaN	UNSOLD
106	Lance Morris	Bowler	Australia	30.0	NaN	NaN	UNSOLD
140	Jhye Richardson	Bowler	Australia	150.0	150.0	MI	SOLD
148	Cameron Green	Allrounder	Australia	200.0	1750.0	MI	SOLD
188	Nathan Ellis	Bowler	Australia	NaN	75.0	PBKS	RETAINED
218	Josh Hazlewood	Bowler	Australia	NaN	775.0	RCB	RETAINED
225	Matthew Wade	WK-Batter	Australia	NaN	240.0	GT	RETAINED
243	Mitchell Marsh	Allrounder	Australia	NaN	650.0	DC	RETAINED
269	David Warner	Batter	Australia	NaN	625.0	DC	RETAINED
281	Glenn Maxwell	Allrounder	Australia	NaN	1100.0	RCB	RETAINED
293	Marcus Stoinis	Allrounder	Australia	NaN	920.0	LSG	RETAINED

In [50]:

```
df[df['status']=='UNSOLD']['base price (in lacs)'].mean()
```

Out[50]:

```
55.63380281690141
```

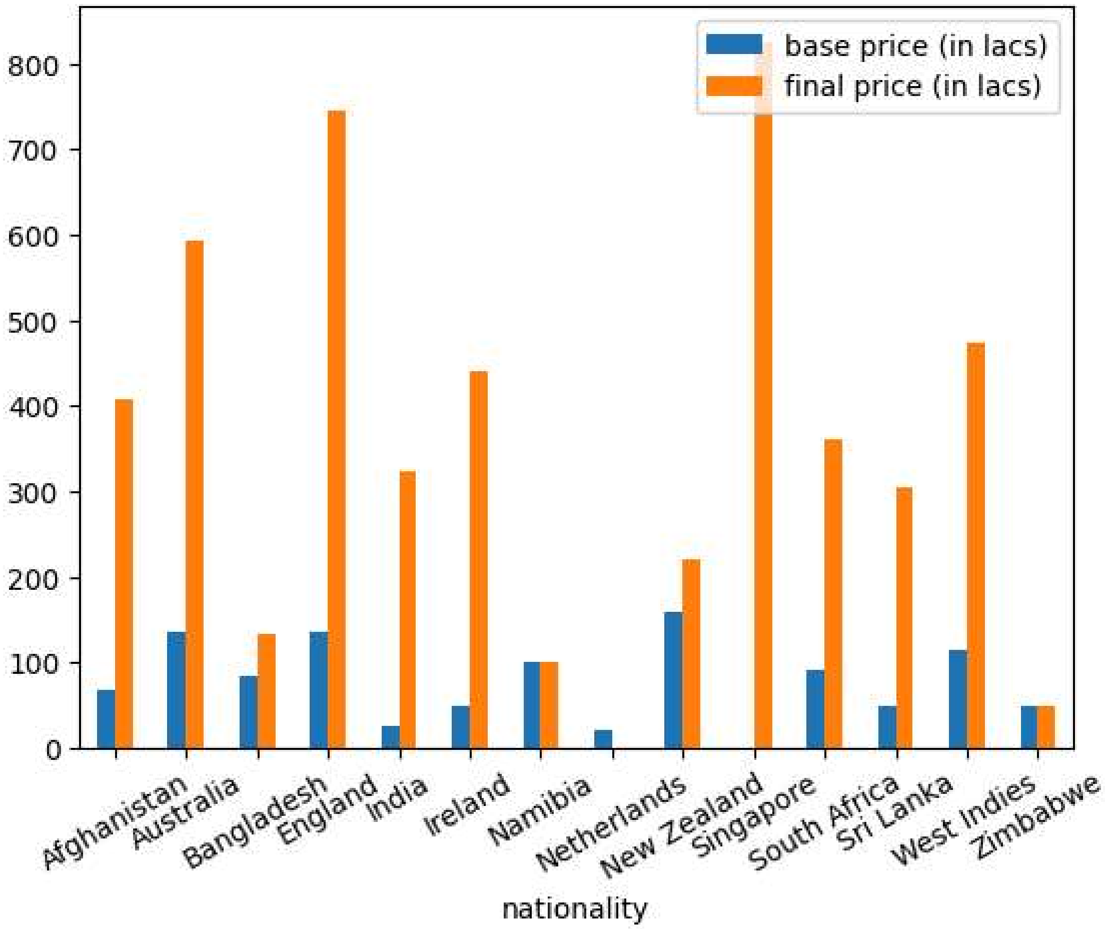
In [51]:

```

x_=nat['nationality']
y_=nat['base price (in lacs)']
y1=nat['final price (in lacs)']

nat.plot(kind='bar',x='nationality')
plt.xticks(rotation=30)
plt.title
plt.show()

```



Status Analysis:

In [52]:

```
stt=df['status'].value_counts().reset_index()
stt
```

Out[52]:

	status	count
0	RETAINED	158
1	SOLD	80
2	UNSOLD	71

In [53]:

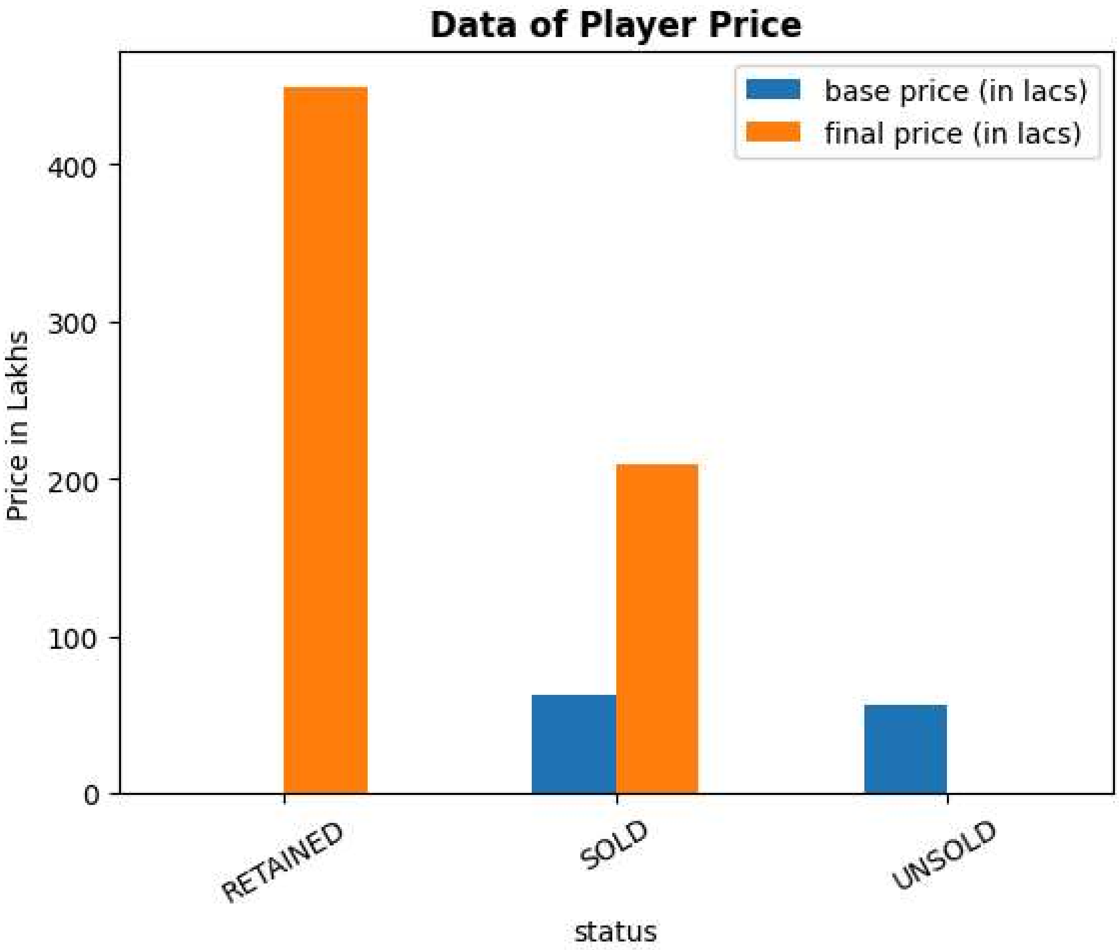
```
data=df.groupby('status')[['base price (in lacs)','final price (in lacs)']].mean().reset_index()
data
```

Out[53]:

	status	base price (in lacs)	final price (in lacs)
0	RETAINED	NaN	448.734177
1	SOLD	62.375000	208.750000
2	UNSOLD	55.633803	NaN

In [54]:

```
data.plot(kind='bar',x='status')
plt.xticks(rotation=30)
plt.ylabel('Price in Lakhs')
plt.title('Data of Player Price',fontweight='bold')
plt.show()
```



In [ ]:

```

```