In [1]:
```
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import seaborn as sns
sns.set(style="whitegrid")
import matplotlib.pyplot as plt
from collections import Counter
%matplotlib inline

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))
```

In [2]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [3]:
```
fifa19=pd.read_csv(r'C:\Users\User\Desktop\Data Science\Seaborn\FIFA.csv',index_
```

In [4]:
```
fifa19
```

Out[4]:

	ID	Name	Age	Photo	Nationa
0	158023	L. Messi	31	https://cdn.sofifa.org/players/4/19/158023.png	Argen
1	20801	Cristiano Ronaldo	33	https://cdn.sofifa.org/players/4/19/20801.png	Portu
2	190871	Neymar Jr	26	https://cdn.sofifa.org/players/4/19/190871.png	B
3	193080	De Gea	27	https://cdn.sofifa.org/players/4/19/193080.png	Sp
4	192985	K. De Bruyne	27	https://cdn.sofifa.org/players/4/19/192985.png	Belg
...	...	...	...	...	
18202	238813	J. Lundstram	19	https://cdn.sofifa.org/players/4/19/238813.png	Engl
18203	243165	N. Christoffersson	19	https://cdn.sofifa.org/players/4/19/243165.png	Swe
18204	241638	B. Worman	16	https://cdn.sofifa.org/players/4/19/241638.png	Engl
18205	246268	D. Walker-Rice	17	https://cdn.sofifa.org/players/4/19/246268.png	Engl
18206	246269	G. Nugent	16	https://cdn.sofifa.org/players/4/19/246269.png	Engl

18207 rows × 88 columns

In [5]:
```
fifa19.head()
```

Out[5]:

	ID	Name	Age	Photo	Nationality	
0	158023	L. Messi	31	https://cdn.sofifa.org/players/4/19/158023.png	Argentina	https
1	20801	Cristiano Ronaldo	33	https://cdn.sofifa.org/players/4/19/20801.png	Portugal	https
2	190871	Neymar Jr	26	https://cdn.sofifa.org/players/4/19/190871.png	Brazil	https
3	193080	De Gea	27	https://cdn.sofifa.org/players/4/19/193080.png	Spain	https
4	192985	K. De Bruyne	27	https://cdn.sofifa.org/players/4/19/192985.png	Belgium	http

5 rows × 88 columns

In [6]:
```
fifa19.info()
```

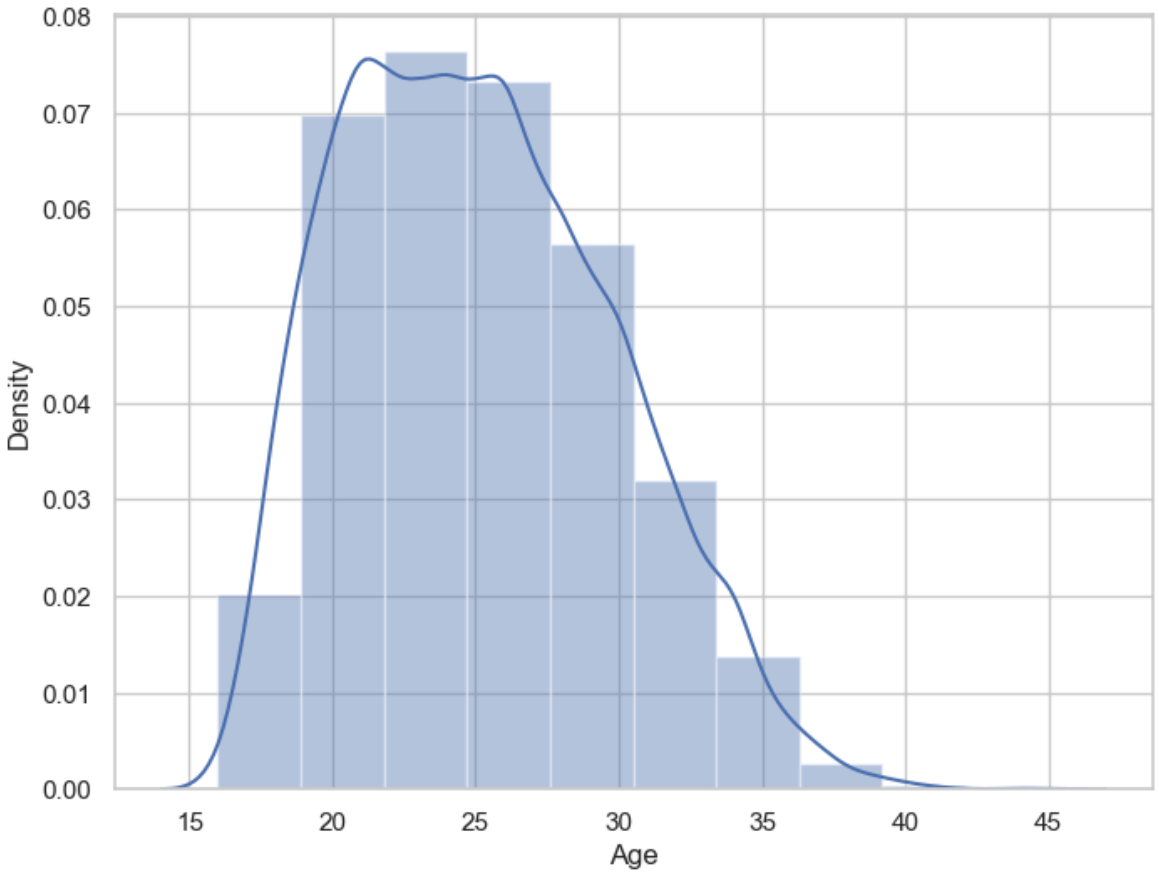
```
<class 'pandas.core.frame.DataFrame'>
Index: 18207 entries, 0 to 18206
Data columns (total 88 columns):
 #   Column                    Non-Null Count  Dtype  
---  ------                    --------------  -----  
 0   ID                        18207 non-null  int64  
 1   Name                      18207 non-null  object 
 2   Age                       18207 non-null  int64  
 3   Photo                     18207 non-null  object 
 4   Nationality               18207 non-null  object 
 5   Flag                      18207 non-null  object 
 6   Overall                   18207 non-null  int64  
 7   Potential                 18207 non-null  int64  
 8   Club                      17966 non-null  object 
 9   Club Logo                 18207 non-null  object 
 10  Value                     18207 non-null  object 
 11  Wage                      18207 non-null  object 
 12  Special                   18207 non-null  int64  
 13  Preferred Foot            18159 non-null  object 
 14  International Reputation  18159 non-null  float64
 15  Weak Foot                 18159 non-null  float64
 16  Skill Moves               18159 non-null  float64
 17  Work Rate                 18159 non-null  object 
 18  Body Type                 18159 non-null  object 
 19  Real Face                 18159 non-null  object 
 20  Position                  18147 non-null  object 
 21  Jersey Number             18147 non-null  float64
 22  Joined                    16654 non-null  object 
 23  Loaned From               1264 non-null   object 
 24  Contract Valid Until      17918 non-null  object 
 25  Height                    18159 non-null  object 
 26  Weight                    18159 non-null  object 
 27  LS                        16122 non-null  object 
 28  ST                        16122 non-null  object 
 29  RS                        16122 non-null  object 
 30  LW                        16122 non-null  object 
 31  LF                        16122 non-null  object 
 32  CF                        16122 non-null  object 
 33  RF                        16122 non-null  object 
 34  RW                        16122 non-null  object 
 35  LAM                       16122 non-null  object 
 36  CAM                       16122 non-null  object 
 37  RAM                       16122 non-null  object 
 38  LM                        16122 non-null  object 
 39  LCM                       16122 non-null  object 
 40  CM                        16122 non-null  object 
 41  RCM                       16122 non-null  object 
 42  RM                        16122 non-null  object 
 43  LWB                       16122 non-null  object 
 44  LDM                       16122 non-null  object 
 45  CDM                       16122 non-null  object 
 46  RDM                       16122 non-null  object 
 47  RWB                       16122 non-null  object 
 48  LB                        16122 non-null  object 
 49  LCB                       16122 non-null  object 
 50  CB                        16122 non-null  object 
 51  RCB                       16122 non-null  object 
 52  RB                        16122 non-null  object 
 53  Crossing                  18159 non-null  float64
 54  Finishing                 18159 non-null  float64
```

```
 55  HeadingAccuracy           18159 non-null  float64
 56  ShortPassing              18159 non-null  float64
 57  Volleys                   18159 non-null  float64
 58  Dribbling                 18159 non-null  float64
 59  Curve                     18159 non-null  float64
 60  FKAccuracy                18159 non-null  float64
 61  LongPassing               18159 non-null  float64
 62  BallControl               18159 non-null  float64
 63  Acceleration              18159 non-null  float64
 64  SprintSpeed               18159 non-null  float64
 65  Agility                   18159 non-null  float64
 66  Reactions                 18159 non-null  float64
 67  Balance                   18159 non-null  float64
 68  ShotPower                 18159 non-null  float64
 69  Jumping                   18159 non-null  float64
 70  Stamina                   18159 non-null  float64
 71  Strength                  18159 non-null  float64
 72  LongShots                 18159 non-null  float64
 73  Aggression                18159 non-null  float64
 74  Interceptions             18159 non-null  float64
 75  Positioning               18159 non-null  float64
 76  Vision                    18159 non-null  float64
 77  Penalties                 18159 non-null  float64
 78  Composure                 18159 non-null  float64
 79  Marking                   18159 non-null  float64
 80  StandingTackle            18159 non-null  float64
 81  SlidingTackle             18159 non-null  float64
 82  GKDiving                  18159 non-null  float64
 83  GKHandling                18159 non-null  float64
 84  GKKicking                 18159 non-null  float64
 85  GKPositioning             18159 non-null  float64
 86  GKReflexes                18159 non-null  float64
 87  Release Clause            16643 non-null  object
dtypes: float64(38), int64(5), object(45)
memory usage: 12.4+ MB
```

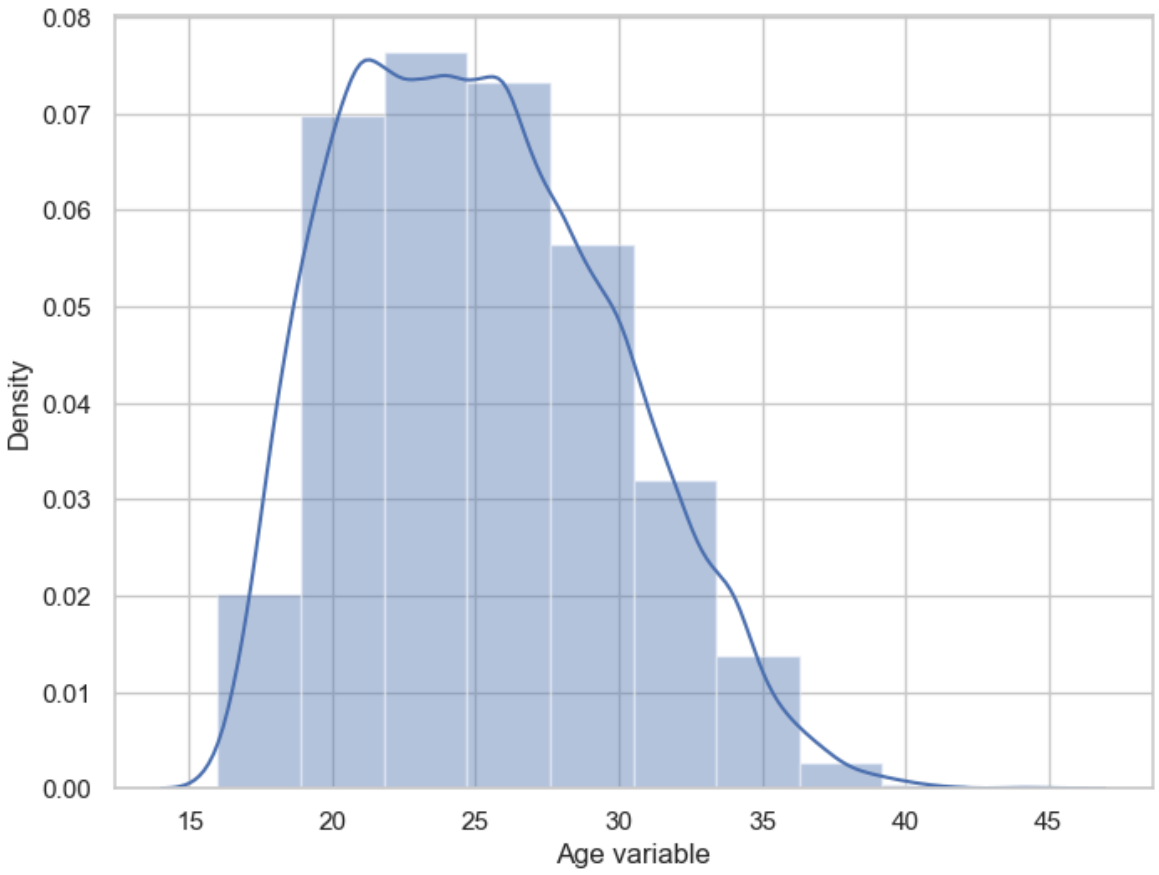
In [7]:
```
fifa19['Body Type'].value_counts()
```

Out[7]:
```
Body Type
Normal                10595
Lean                   6417
Stocky                 1140
Messi                     1
C. Ronaldo                1
Neymar                    1
Courtois                  1
PLAYER_BODY_TYPE_25       1
Shaqiri                   1
Akinfenwa                 1
Name: count, dtype: int64
```

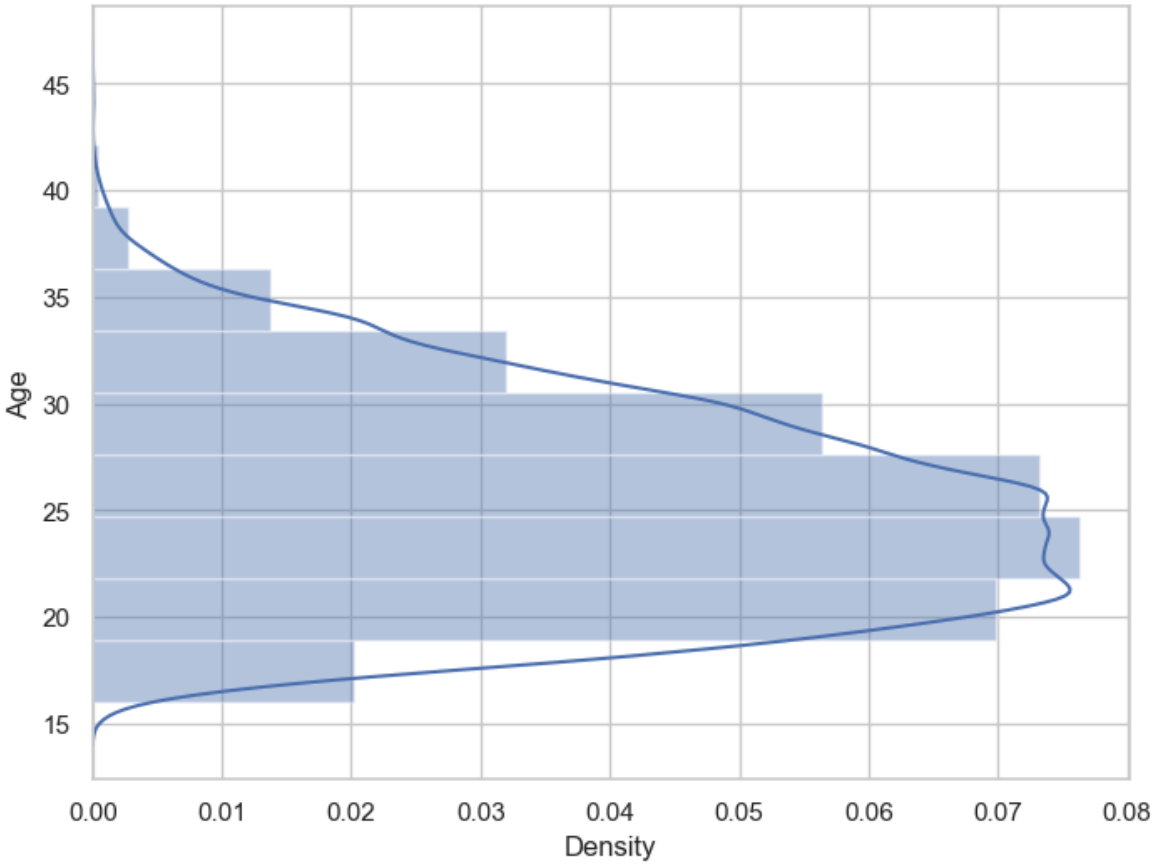
In [8]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
ax=sns.distplot(x,bins=10)
plt.show()
```



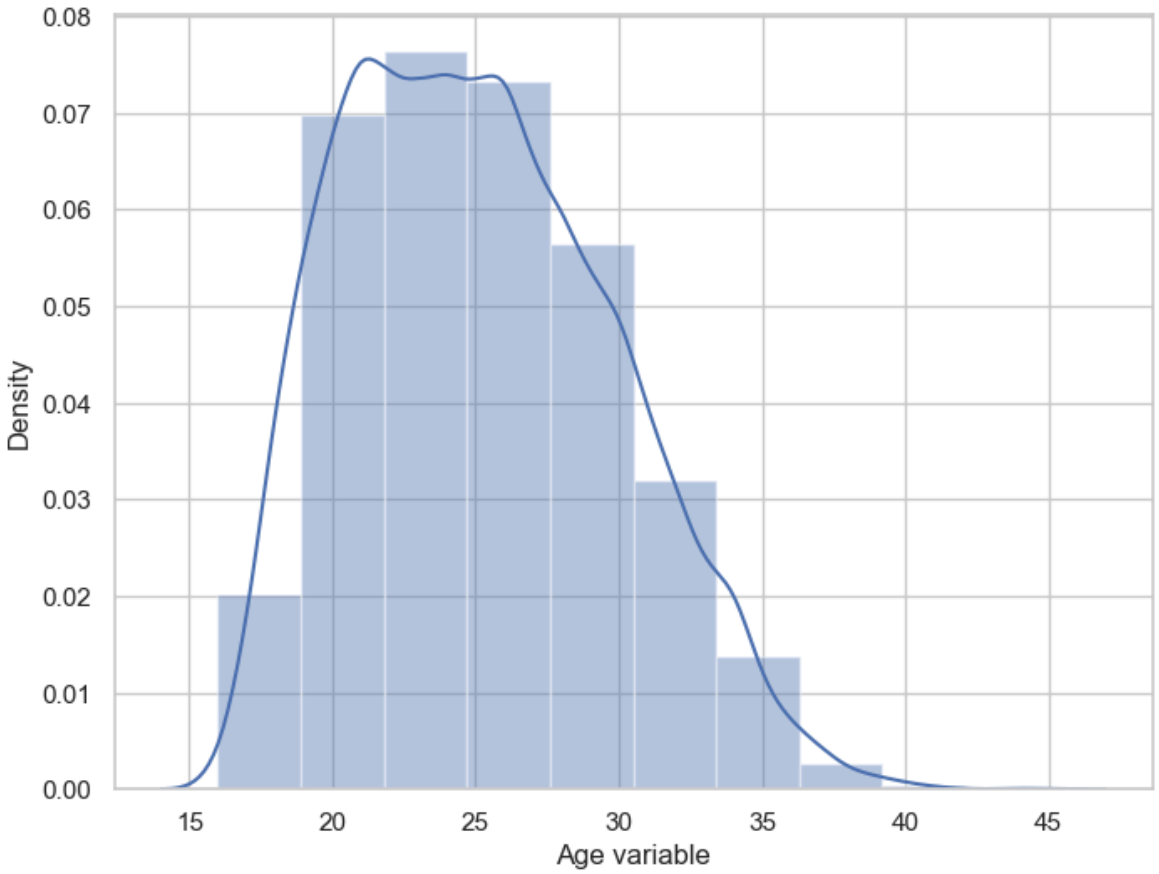
In [11]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
x=pd.Series(x,name='Age variable')
ax=sns.distplot(x,bins=10)
plt.show()
```



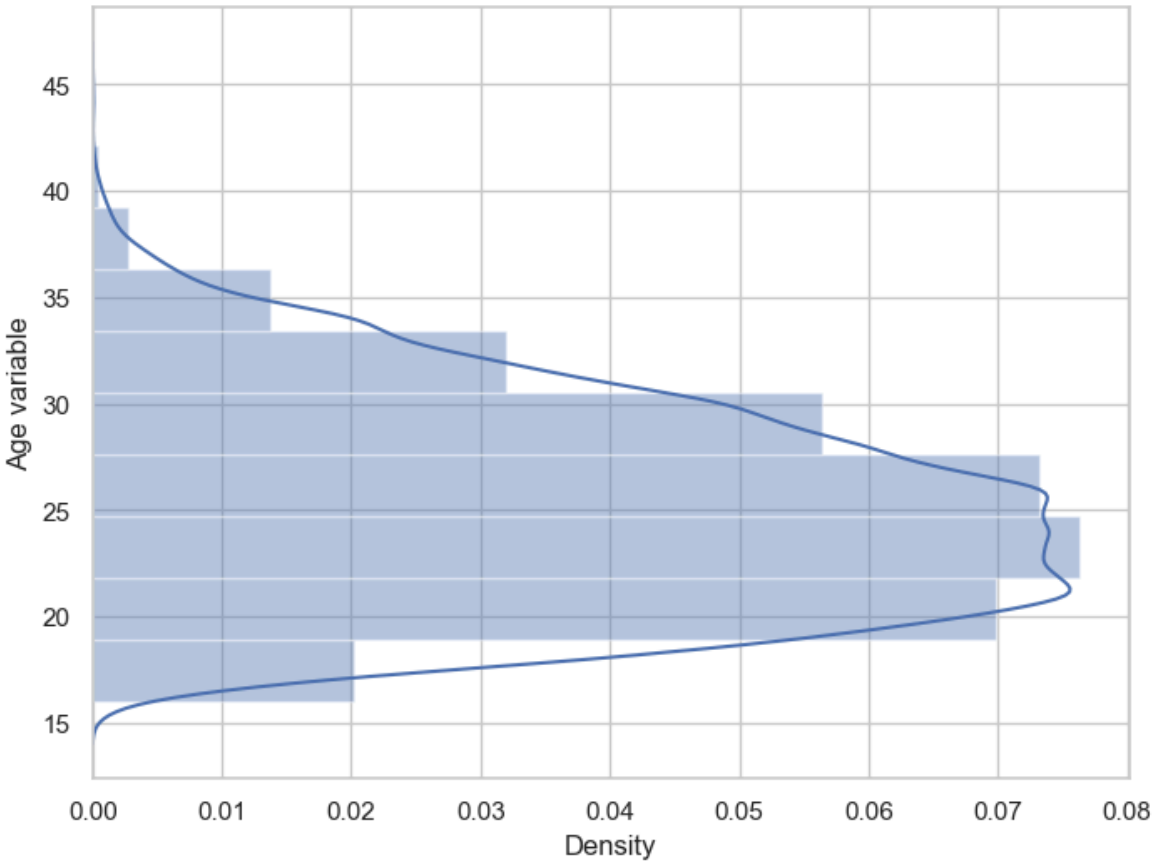
In [15]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
ax=sns.distplot(x,bins=10,vertical=True)
plt.show()
```



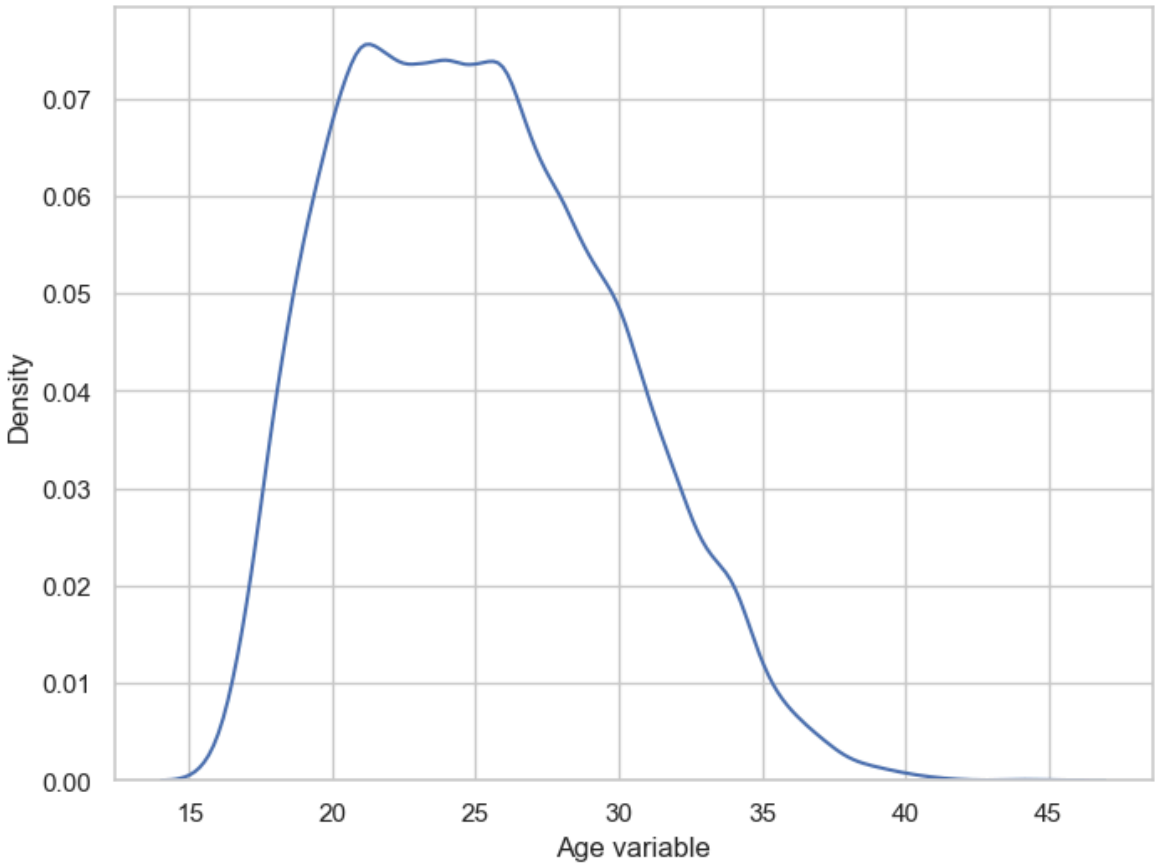
In [19]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
x=pd.Series(x,name='Age variable')
ax=sns.distplot(x,bins=10)
plt.show()
```



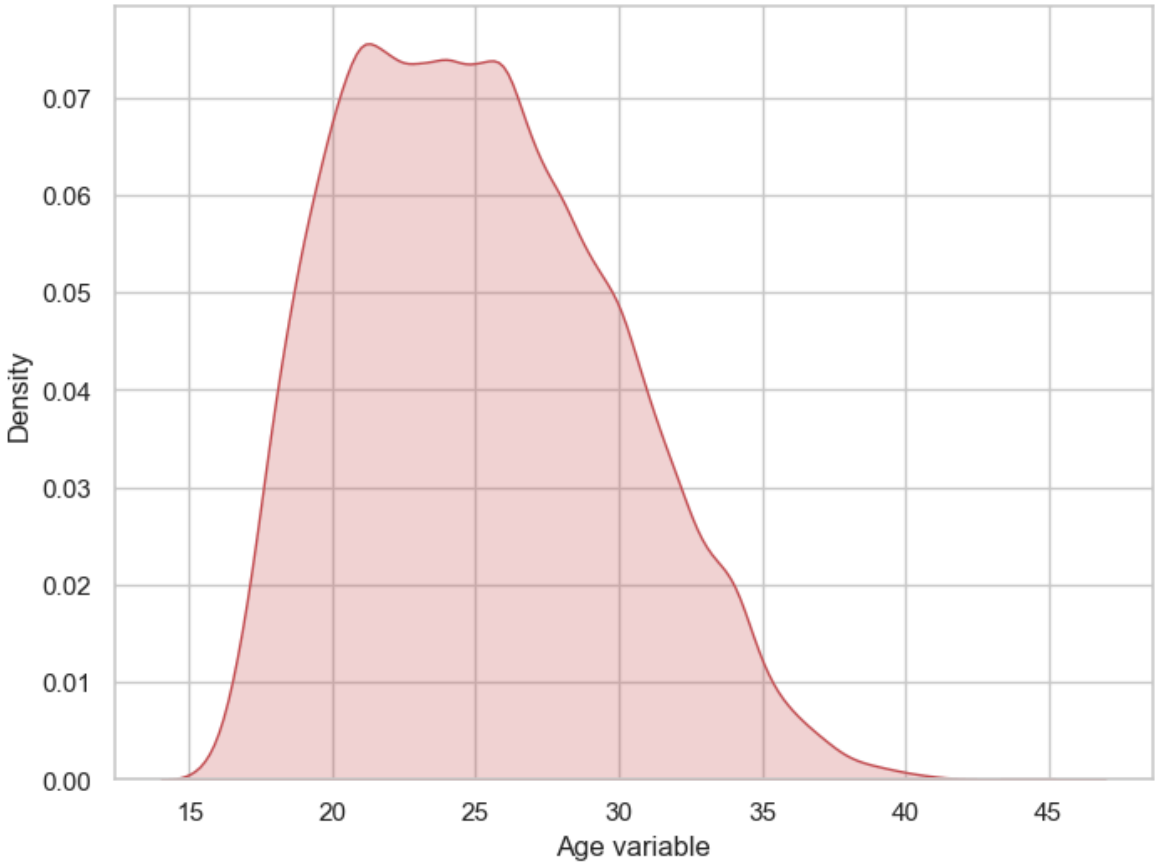
In [23]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
x=pd.Series(x,name='Age variable')
ax=sns.distplot(x,bins=10,vertical=True)
plt.show()
```



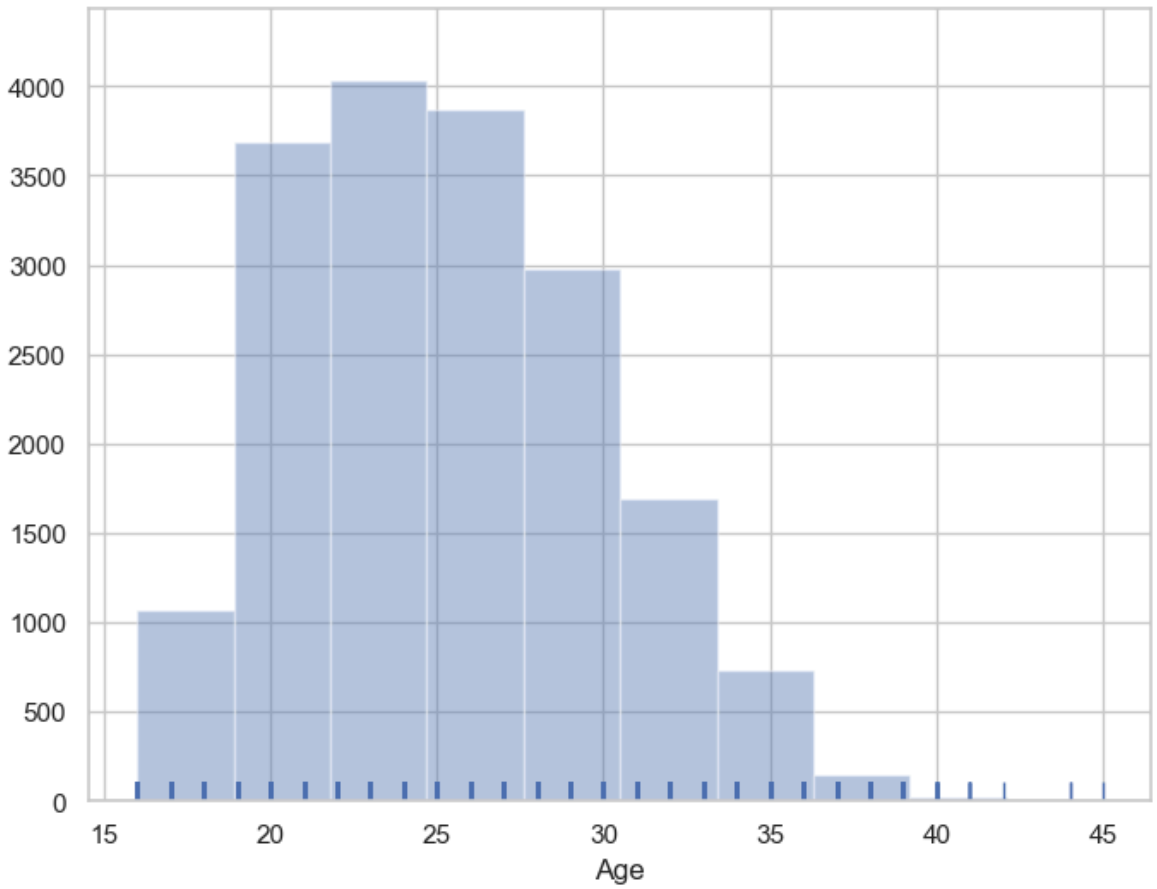
In [27]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
x=pd.Series(x,name='Age variable')
ax=sns.kdeplot(x)
plt.show()
```



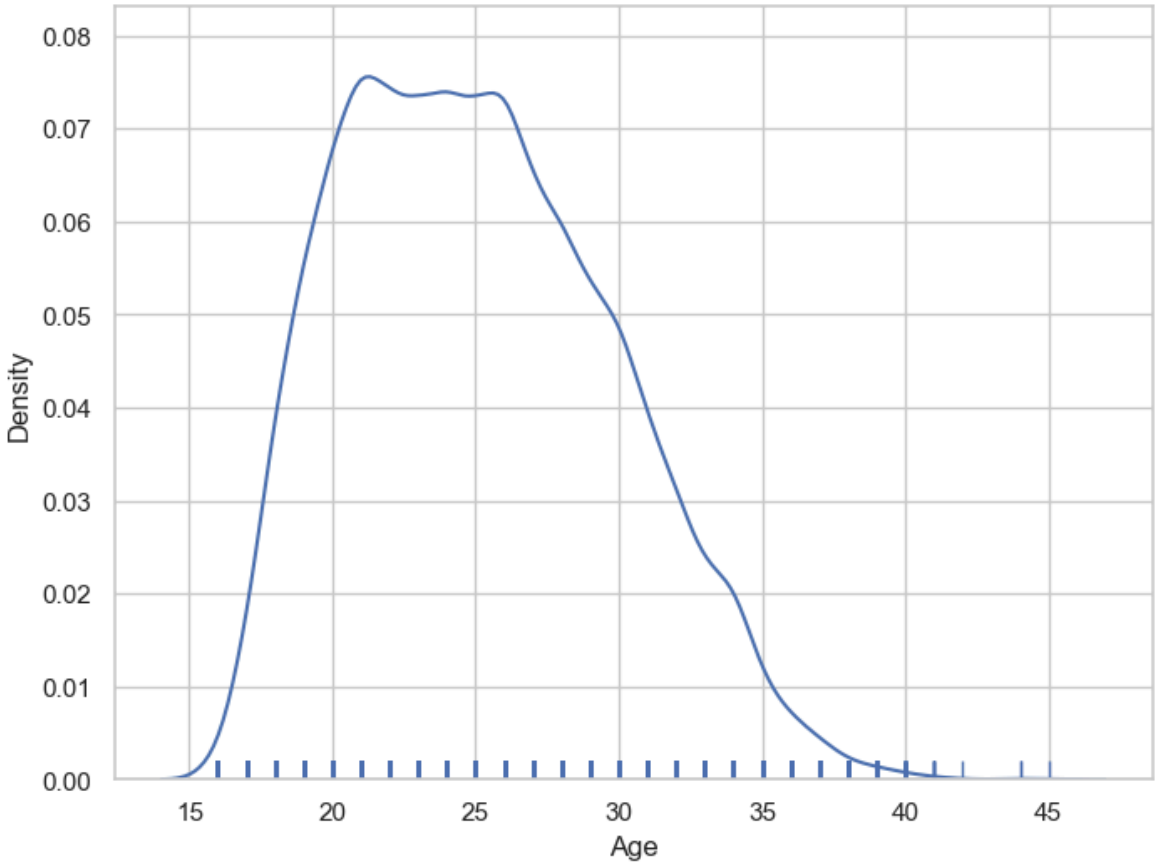
In [31]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
x=pd.Series(x,name='Age variable')
ax=sns.kdeplot(x,shade=True,color='r')
plt.show()
```



In [33]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
ax=sns.distplot(x,kde=False,rug=True,bins=10)
plt.show()
```



In [35]:
```
f,ax=plt.subplots(figsize=(8,6))
x=fifa19['Age']
ax=sns.distplot(x,hist=False,rug=True,bins=10)
plt.show()
```



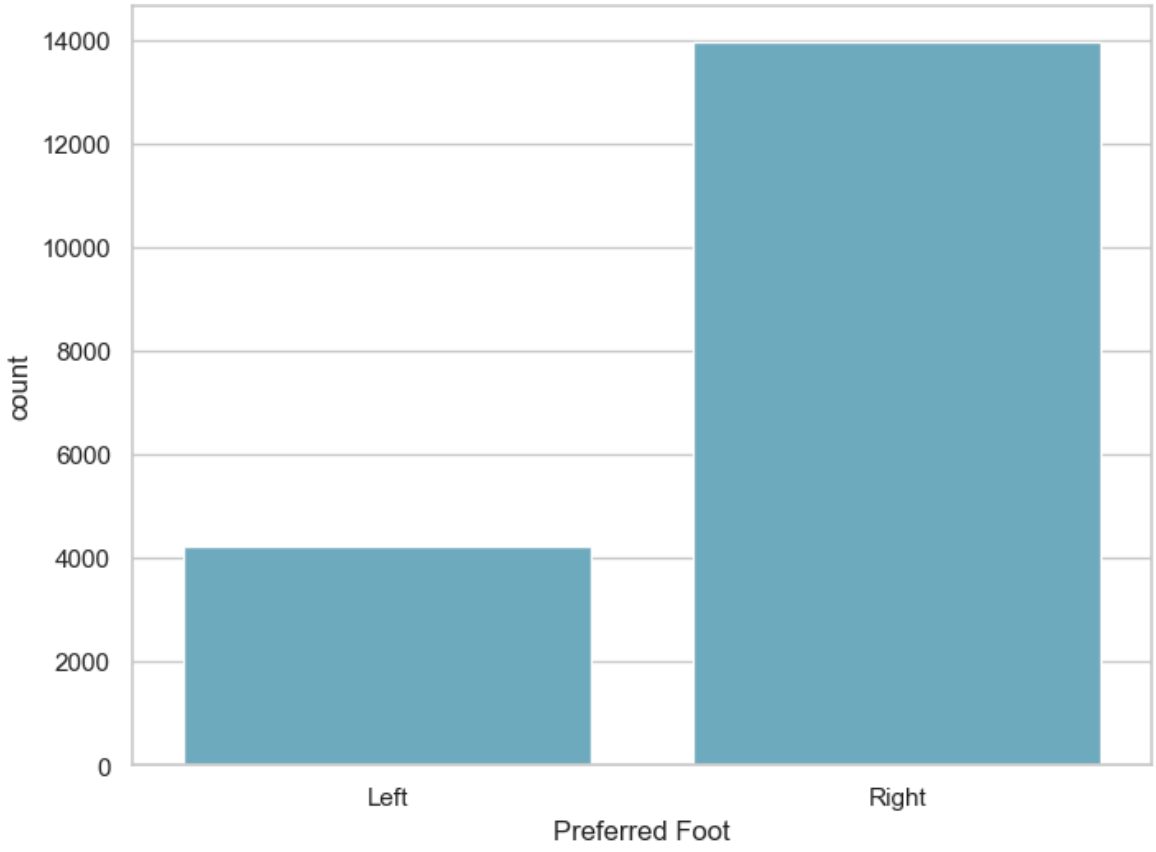
In [37]:
```
fifa19['Preferred Foot'].nunique()
```

Out[37]:
```
2
```

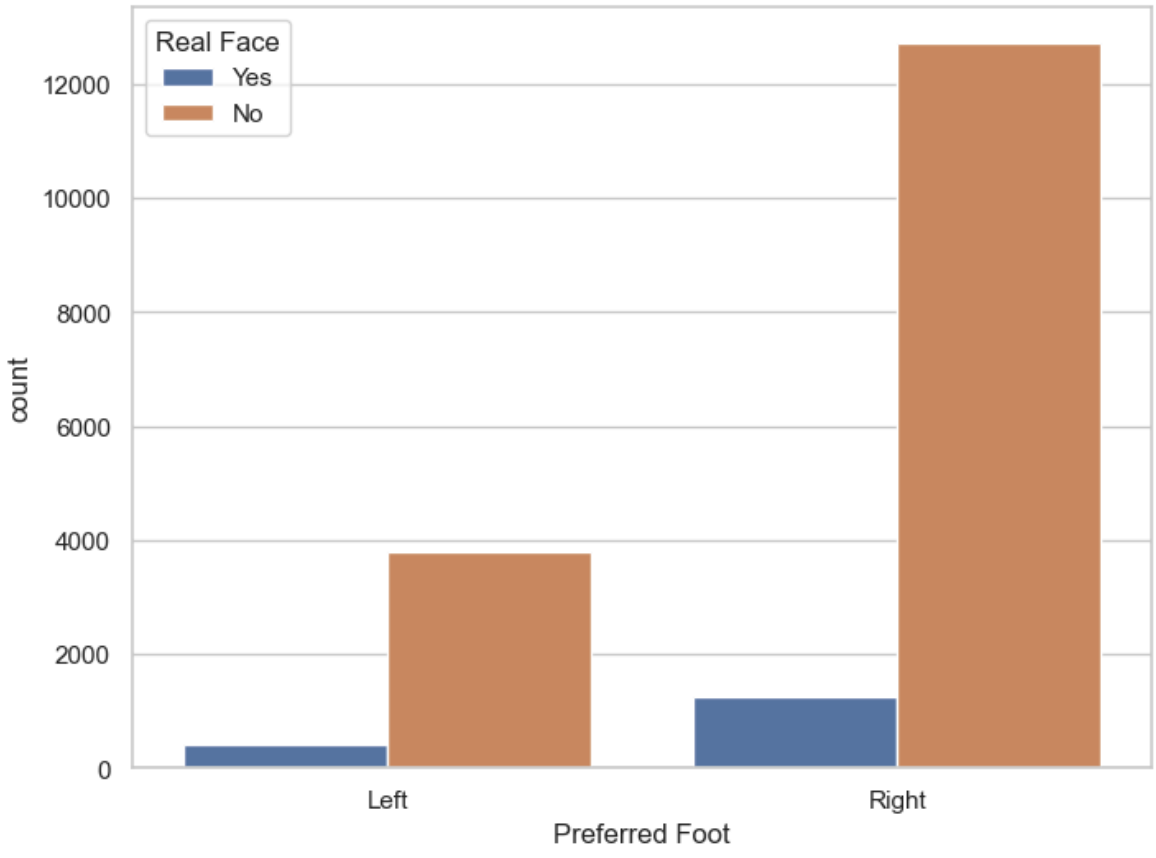
In [39]:
```
fifa19['Preferred Foot'].value_counts()
```

Out[39]:
```
Preferred Foot
Right    13948
Left      4211
Name: count, dtype: int64
```

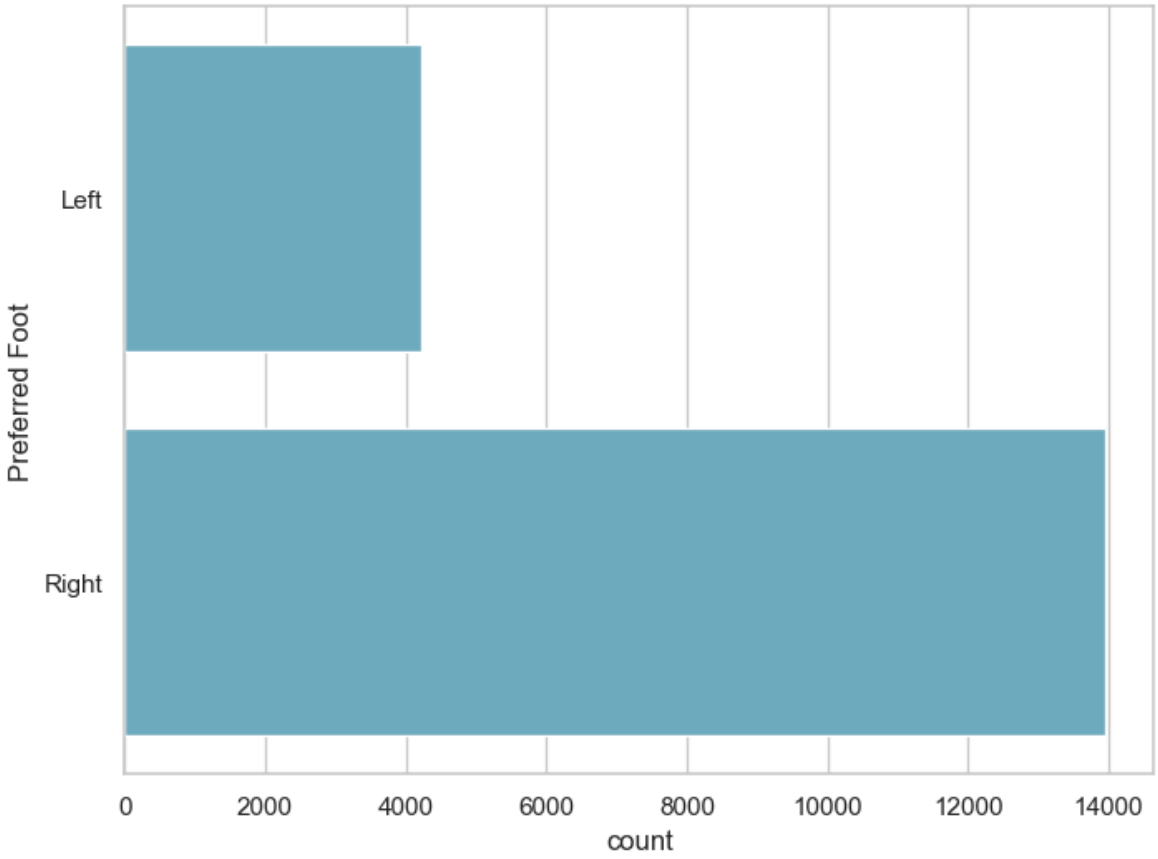
In [45]:
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.countplot(x='Preferred Foot',data=fifa19,color='c')
plt.show()
```



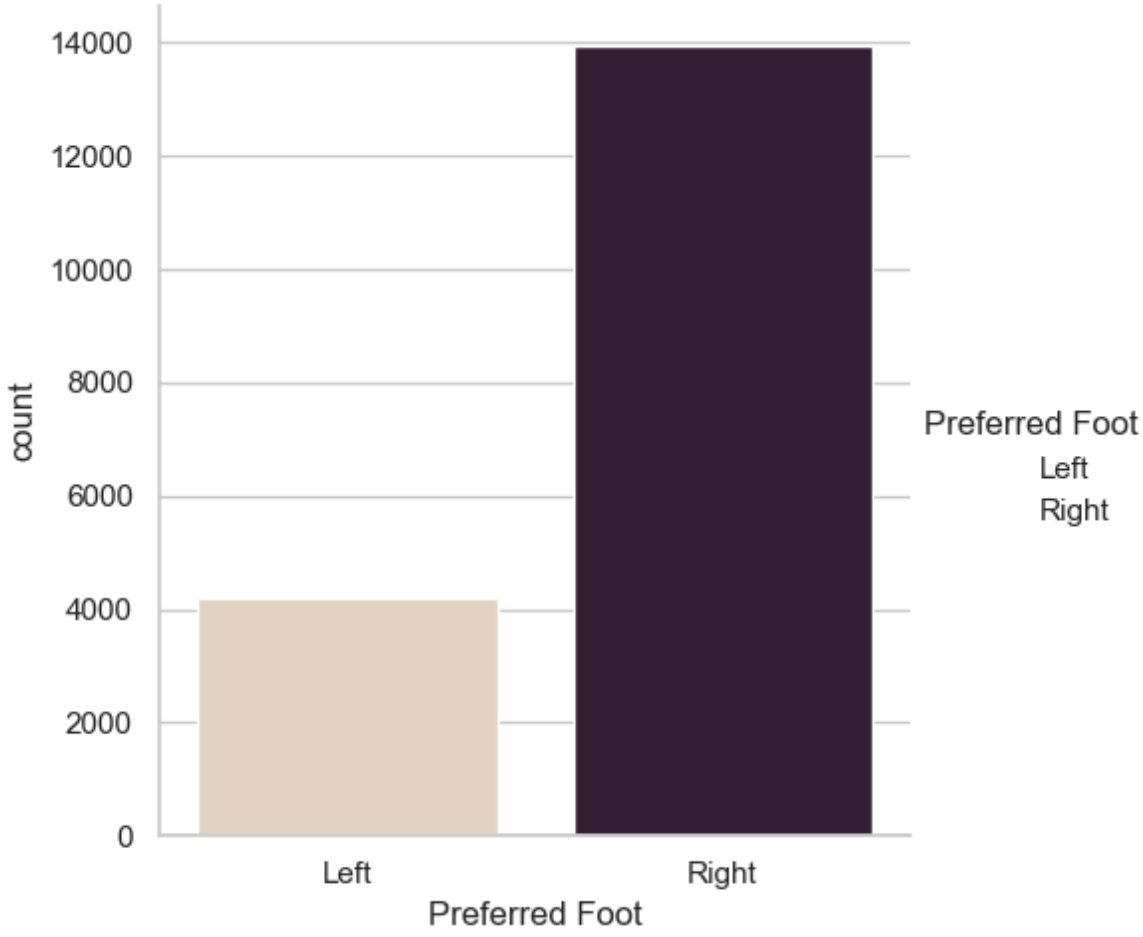
In [47]:
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.countplot(x='Preferred Foot',hue='Real Face',data=fifa19)
plt.show()
```



In [49]:
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.countplot(y='Preferred Foot',data=fifa19,color='c')
plt.show()
```



In [61]:
```
ax=sns.catplot(x='Preferred Foot', kind="count", palette="ch:.25",data=fifa19)
```



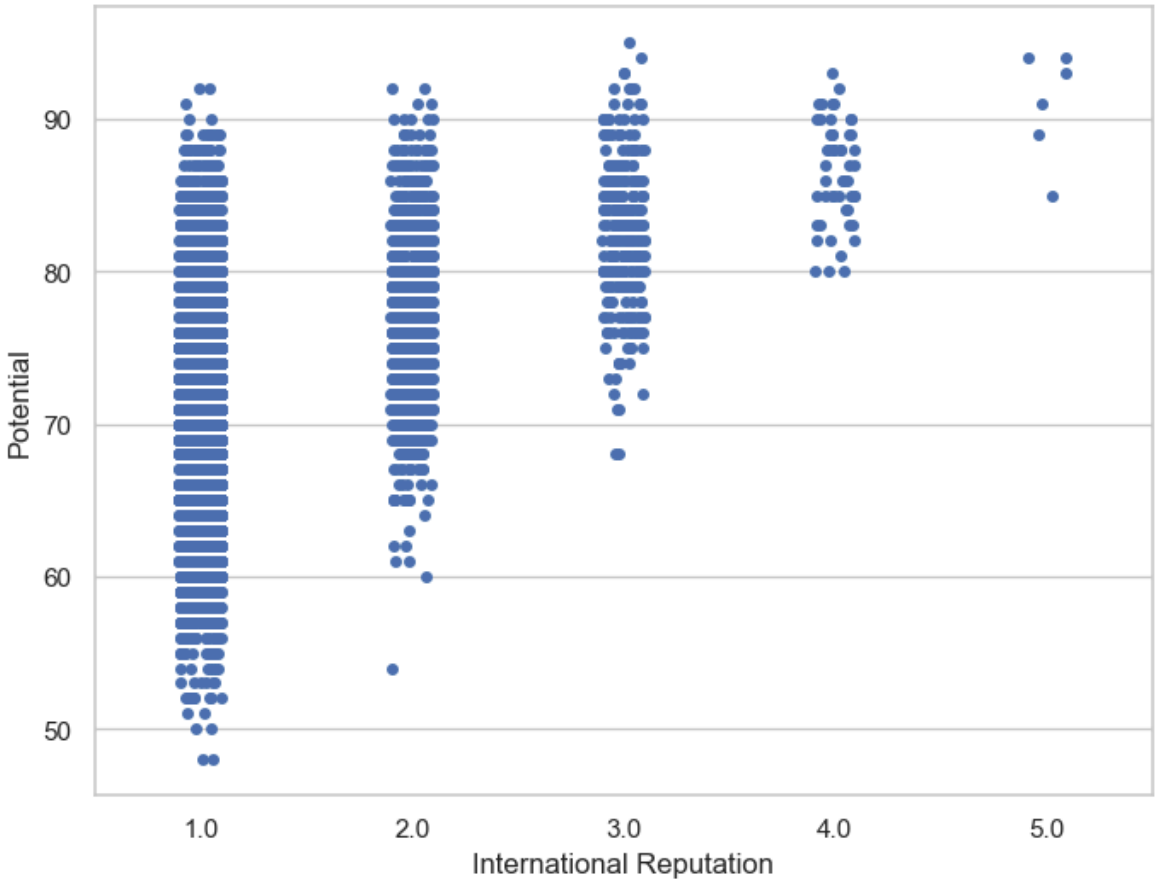
In [63]:
```
fifa19['International Reputation'].nunique()
```

Out[63]:
```
5
```

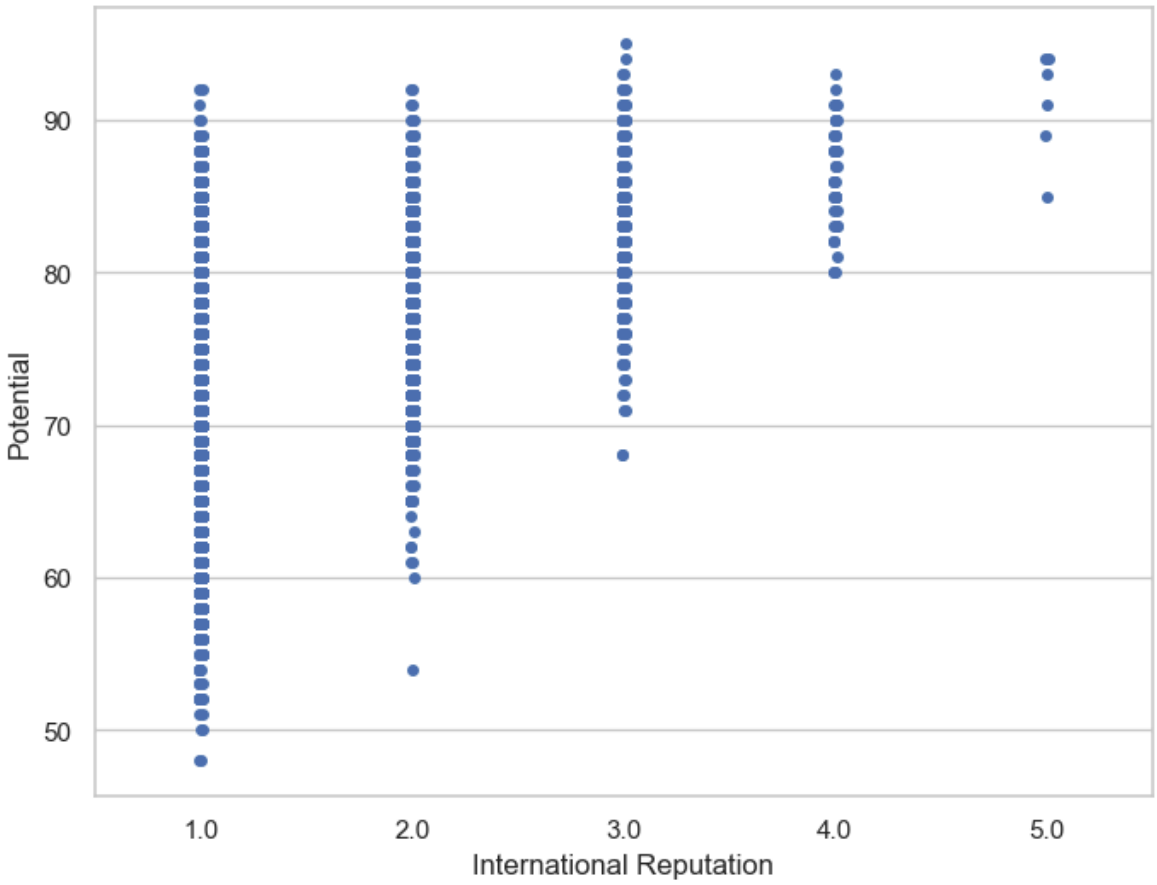
In [65]:
```
fifa19['International Reputation'].value_counts()
```

Out[65]:
```
International Reputation
1.0    16532
2.0     1261
3.0      309
4.0       51
5.0        6
Name: count, dtype: int64
```

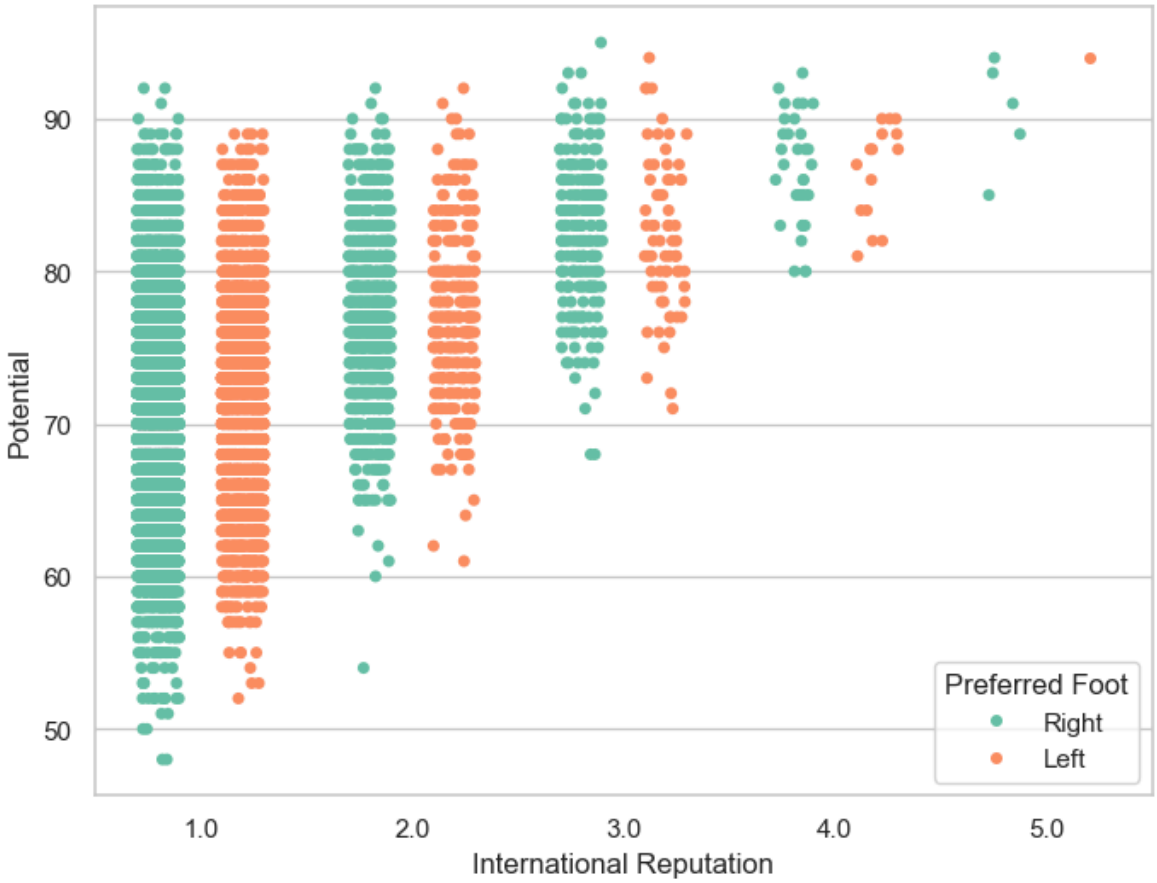
In [69]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.stripplot(x='International Reputation',y='Potential',data=fifa19)
plt.show()
```



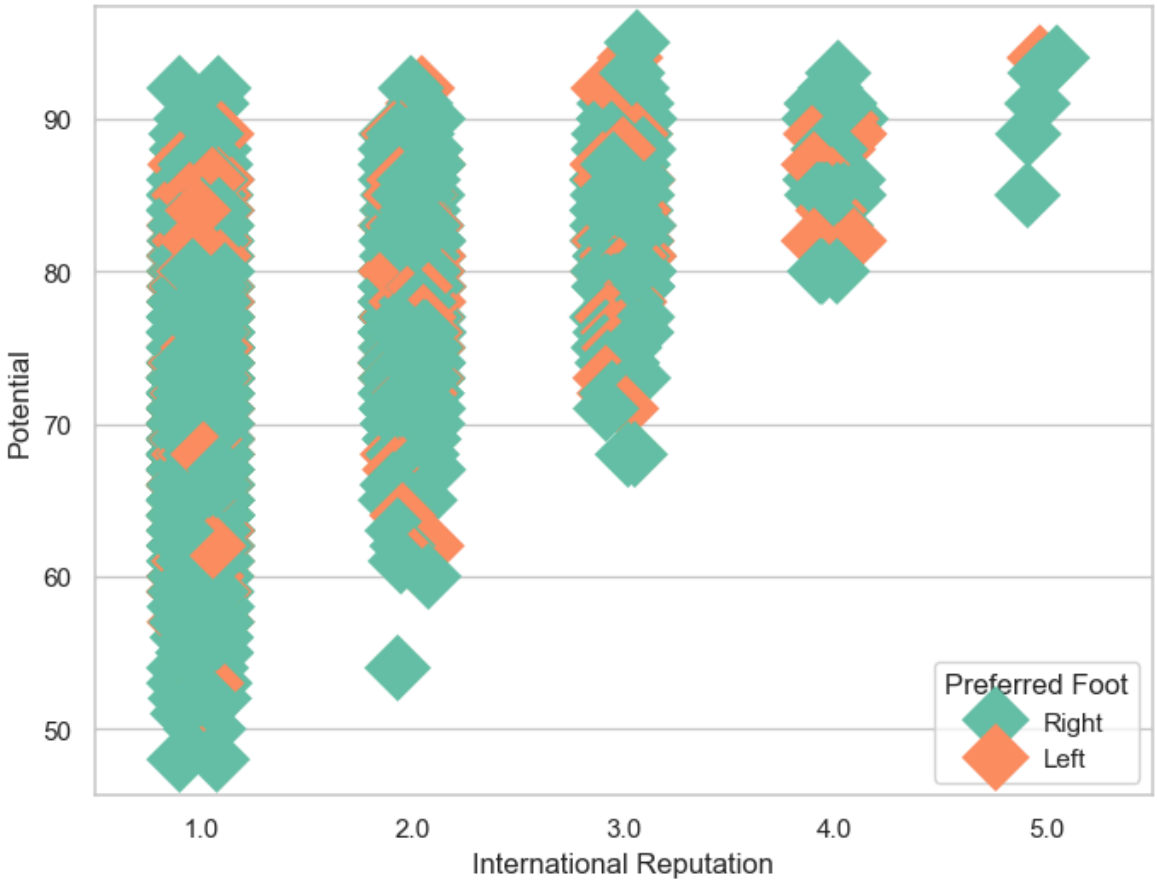
In [71]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.stripplot(x='International Reputation',y='Potential',data=fifa19,jitter=0.01
plt.show()
```



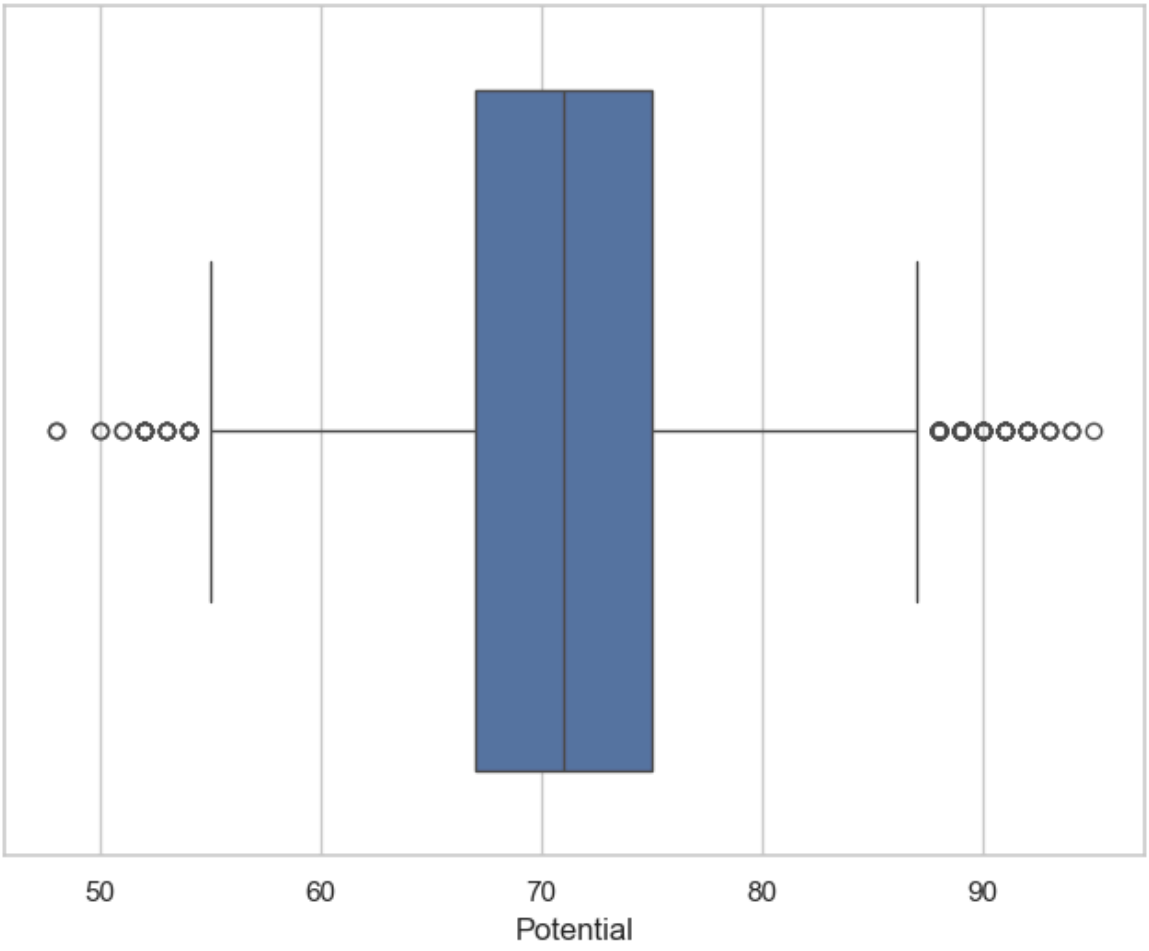
In [75]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.stripplot(x='International Reputation',y='Potential',hue='Preferred Foot',
              data=fifa19,jitter=0.2,palette='Set2',dodge=True)
plt.show()
```



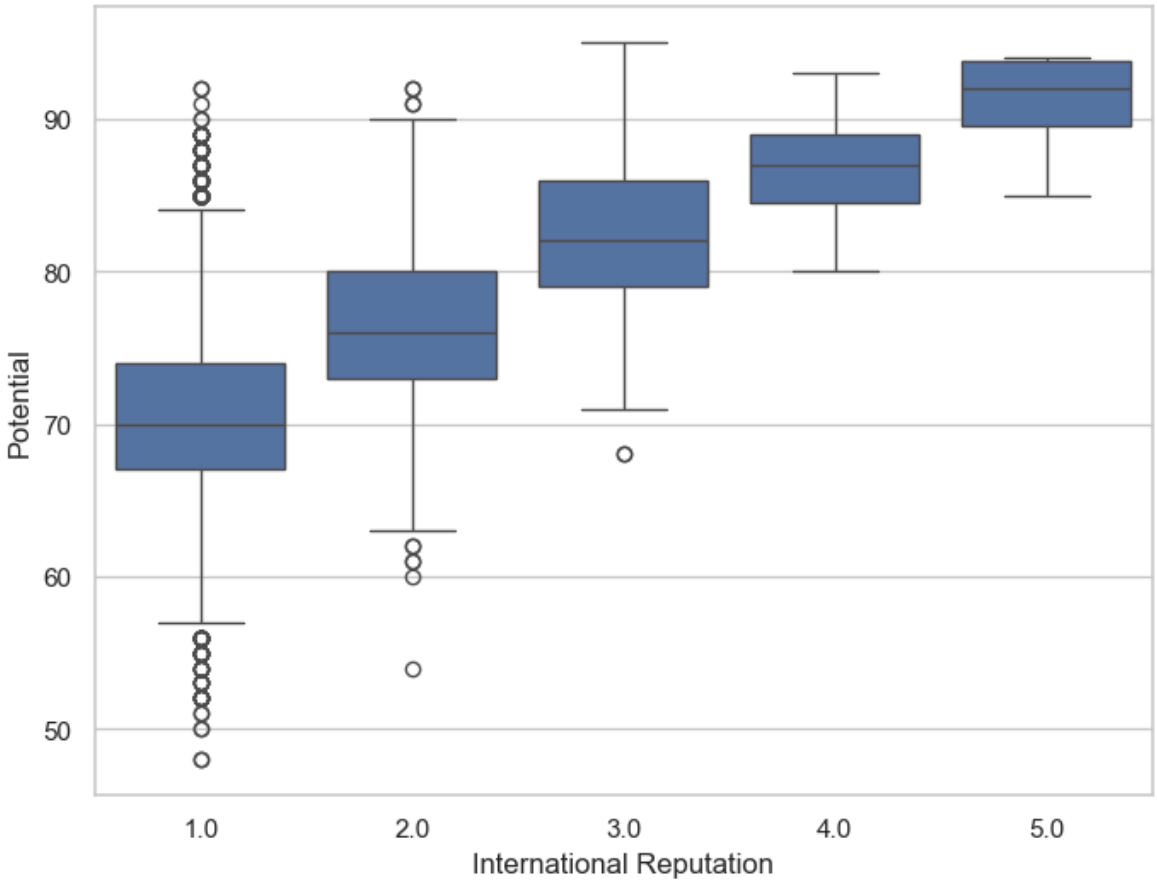
In [77]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.stripplot(x='International Reputation',y='Potential',hue='Preferred Foot',
              data=fifa19,palette='Set2',size=20,marker='D')
plt.show()
```



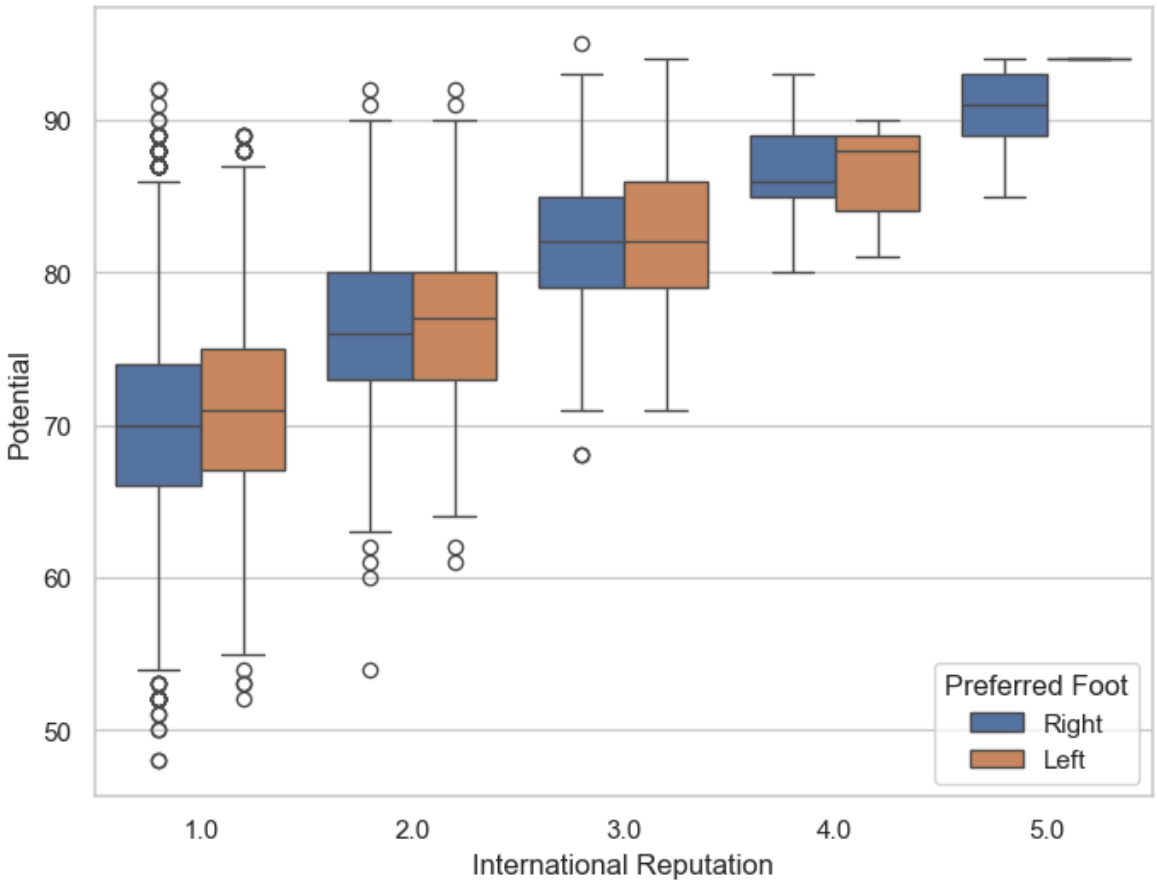
In [79]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.boxplot(x=fifa19['Potential'])
plt.show()
```



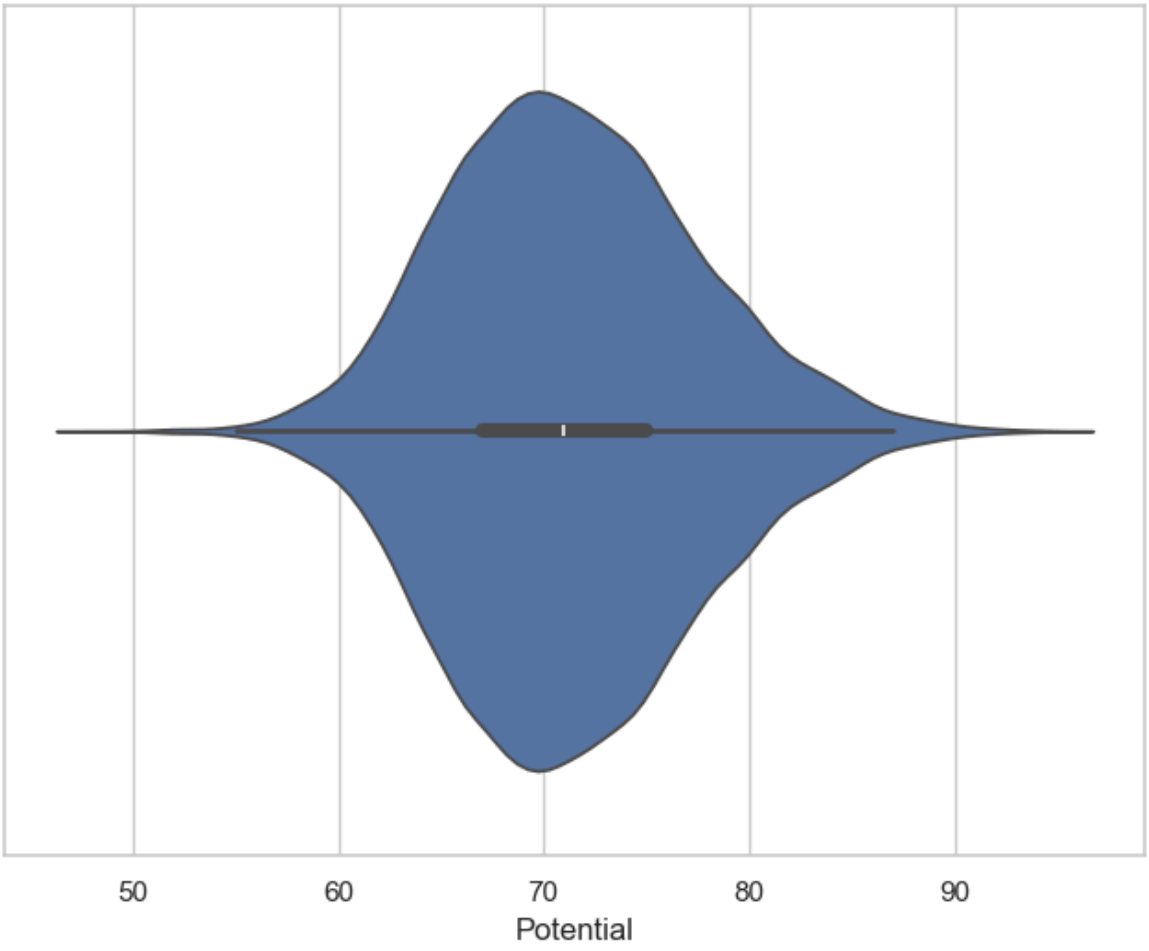
In [81]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.boxplot(x='International Reputation',y='Potential', data=fifa19)
plt.show()
```



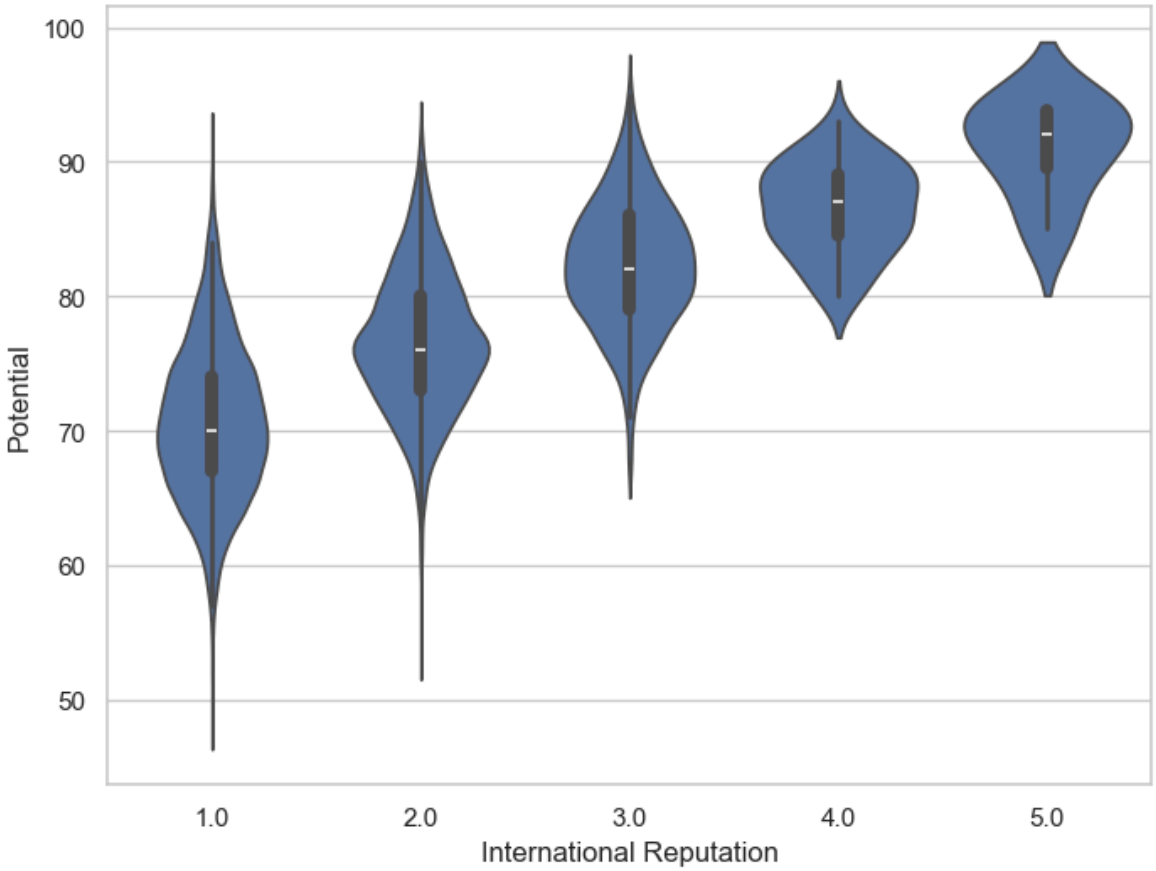
In [83]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.boxplot(x='International Reputation',y='Potential',hue='Preferred Foot', dat
plt.show()
```



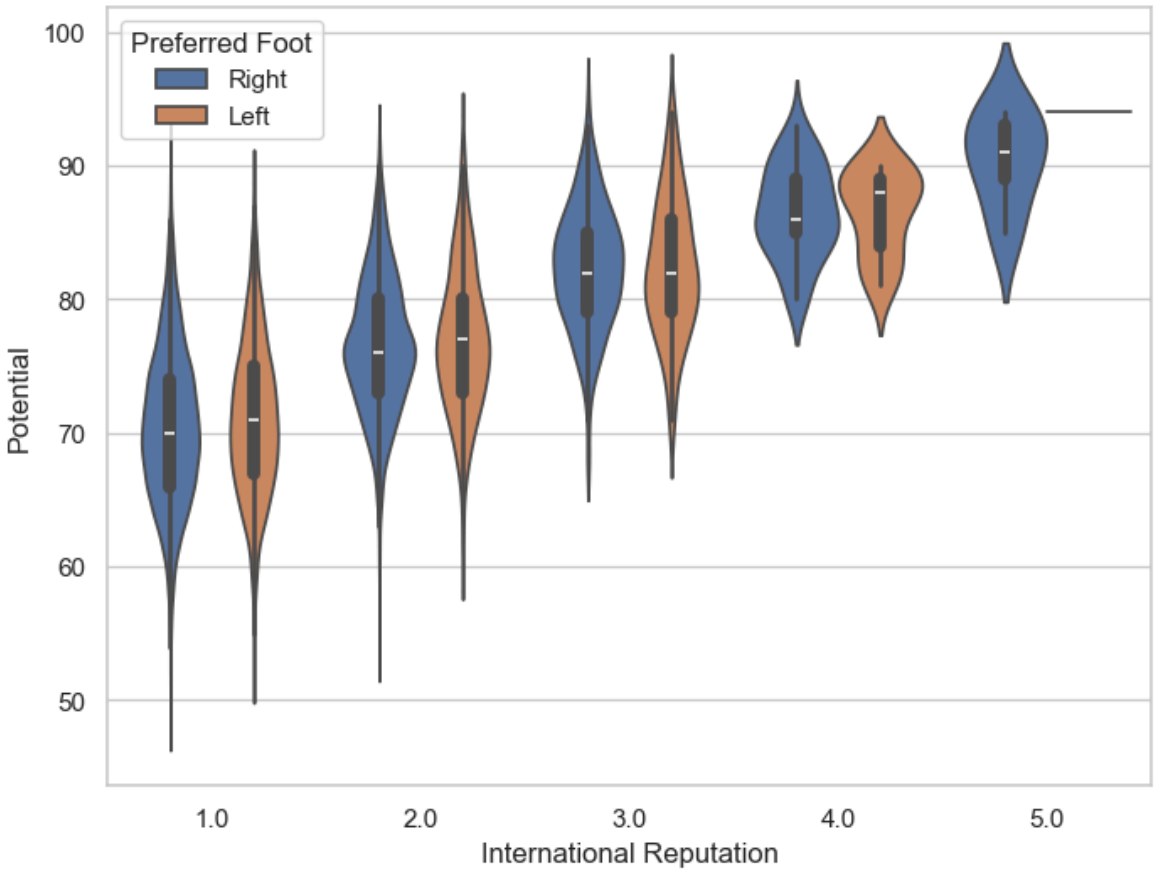
In [87]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.violinplot(x=fifa19['Potential'])
plt.show()
```



In [89]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.violinplot(x='International Reputation',y='Potential', data=fifa19)
plt.show()
```

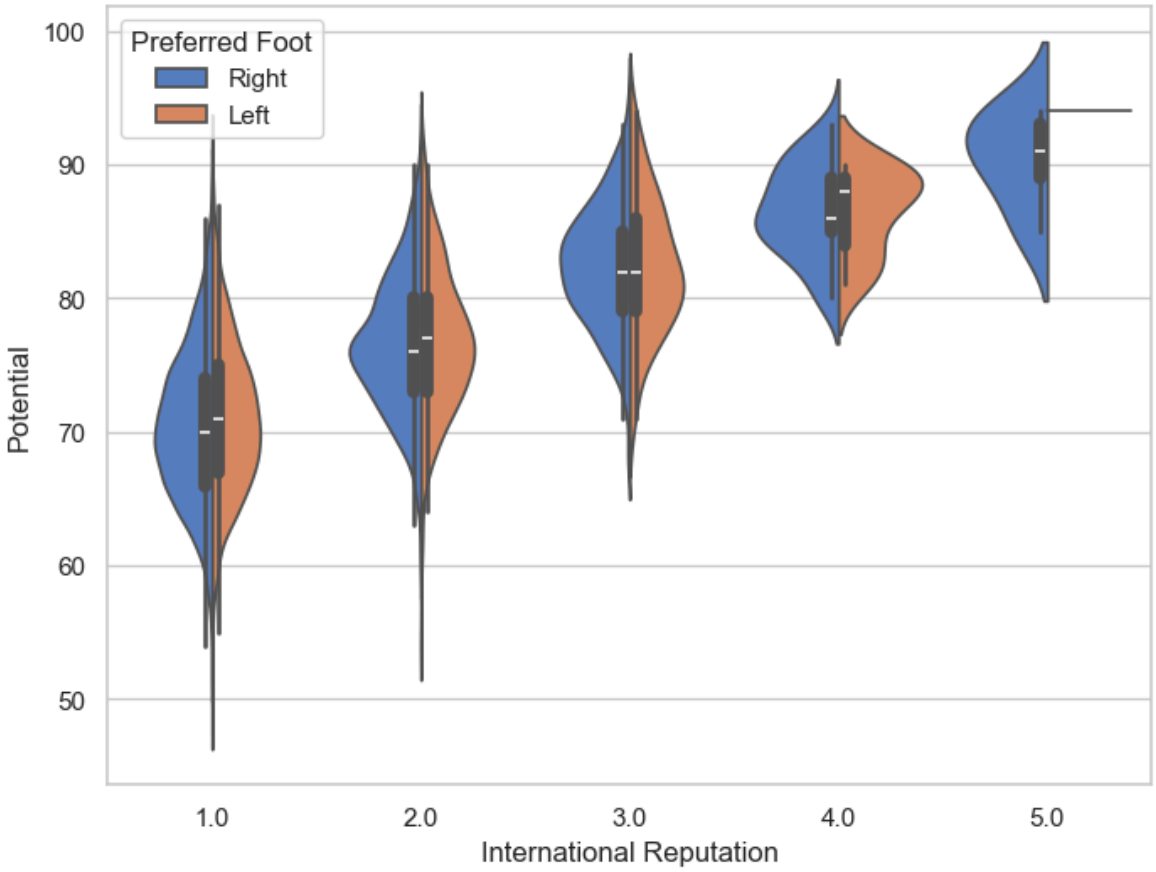


In [91]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.violinplot(x='International Reputation',y='Potential',hue='Preferred Foot',
plt.show()
```

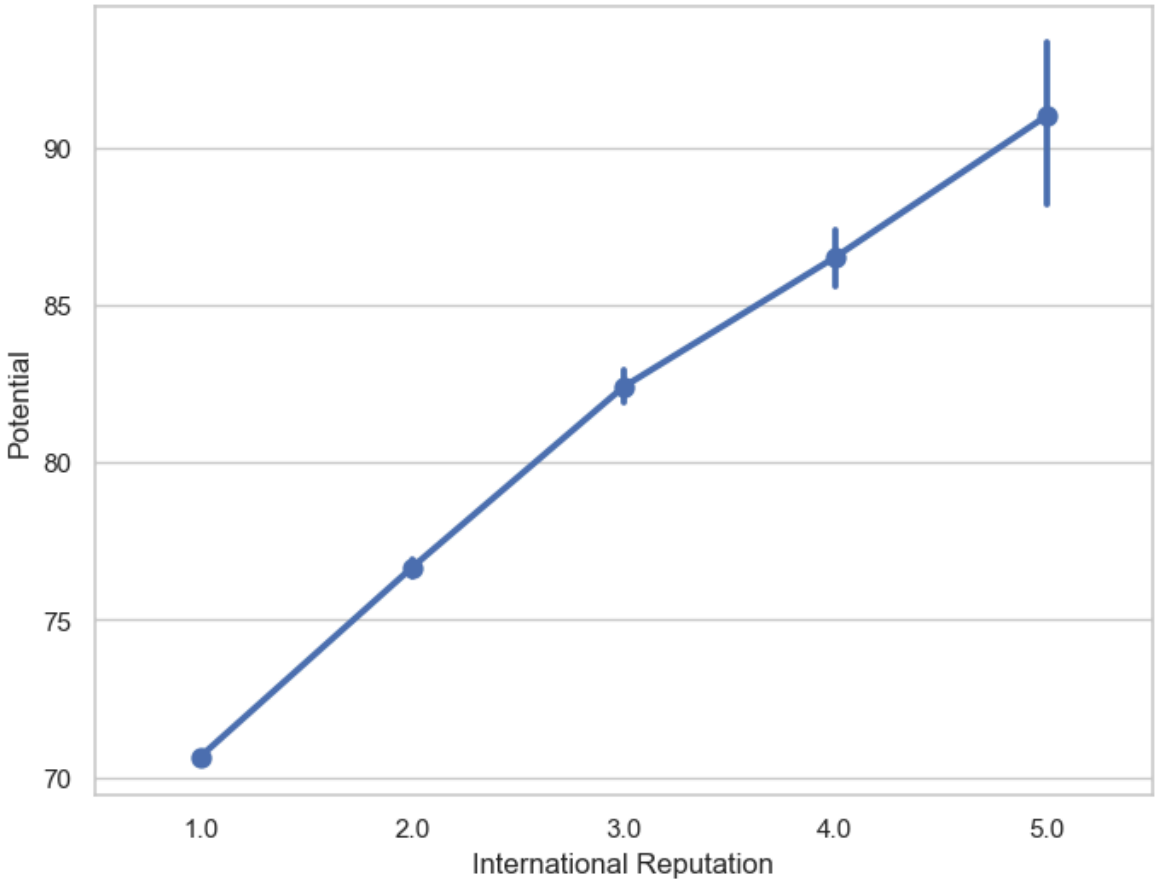


In [95]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.violinplot(x='International Reputation',y='Potential',hue='Preferred Foot',
```

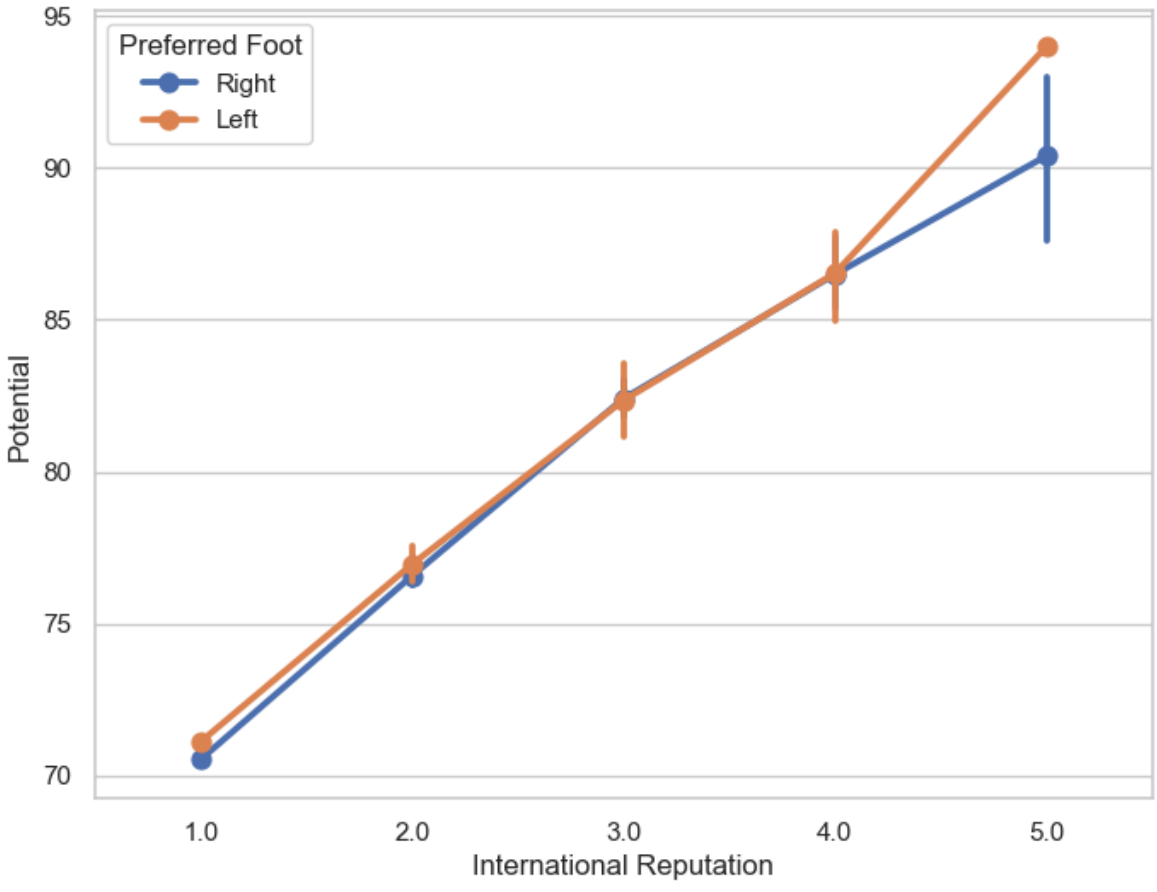
```
                data=fifa19,palette='muted',split=True)
plt.show()
```



In [97]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.pointplot(x='International Reputation',y='Potential', data=fifa19)
plt.show()
```

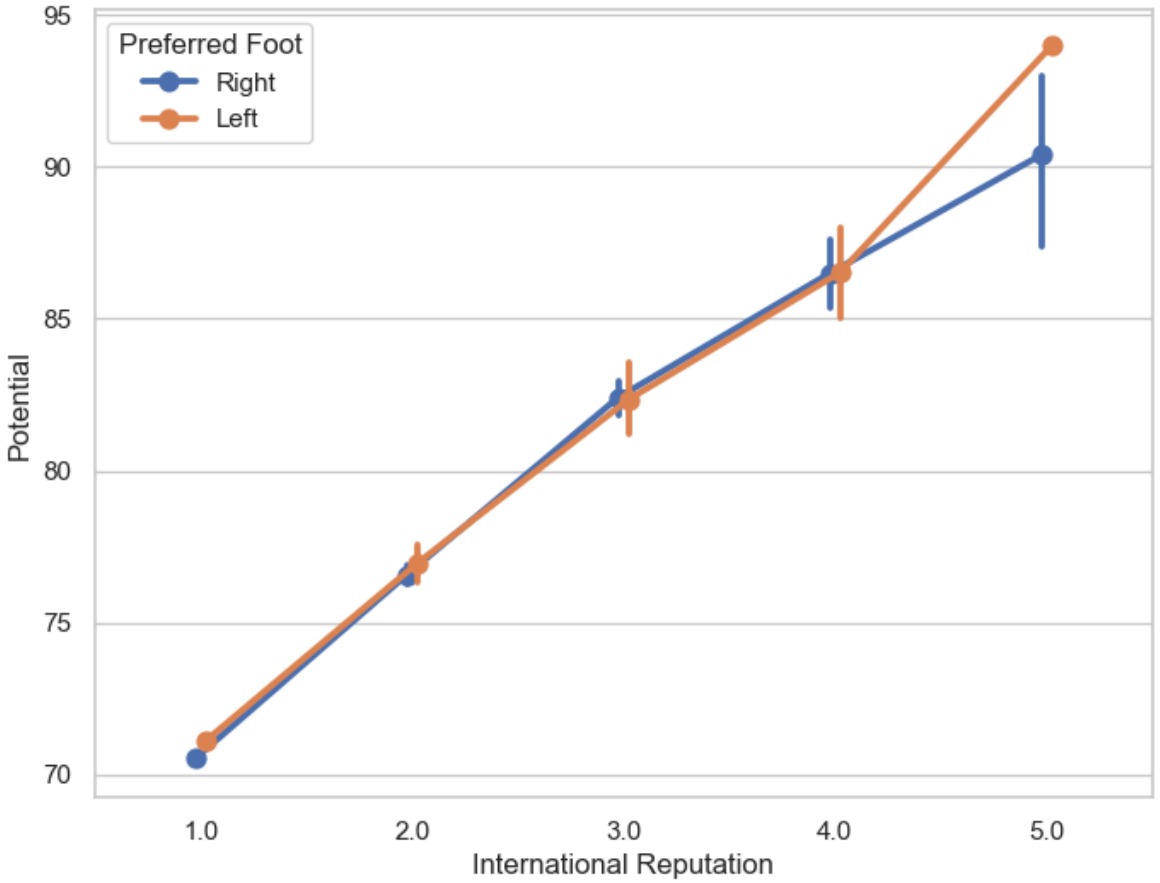


In [99]:
```
f,ax=plt.subplots(figsize=(8,6))
sns.pointplot(x='International Reputation',y='Potential',hue='Preferred Foot', d
plt.show()
```



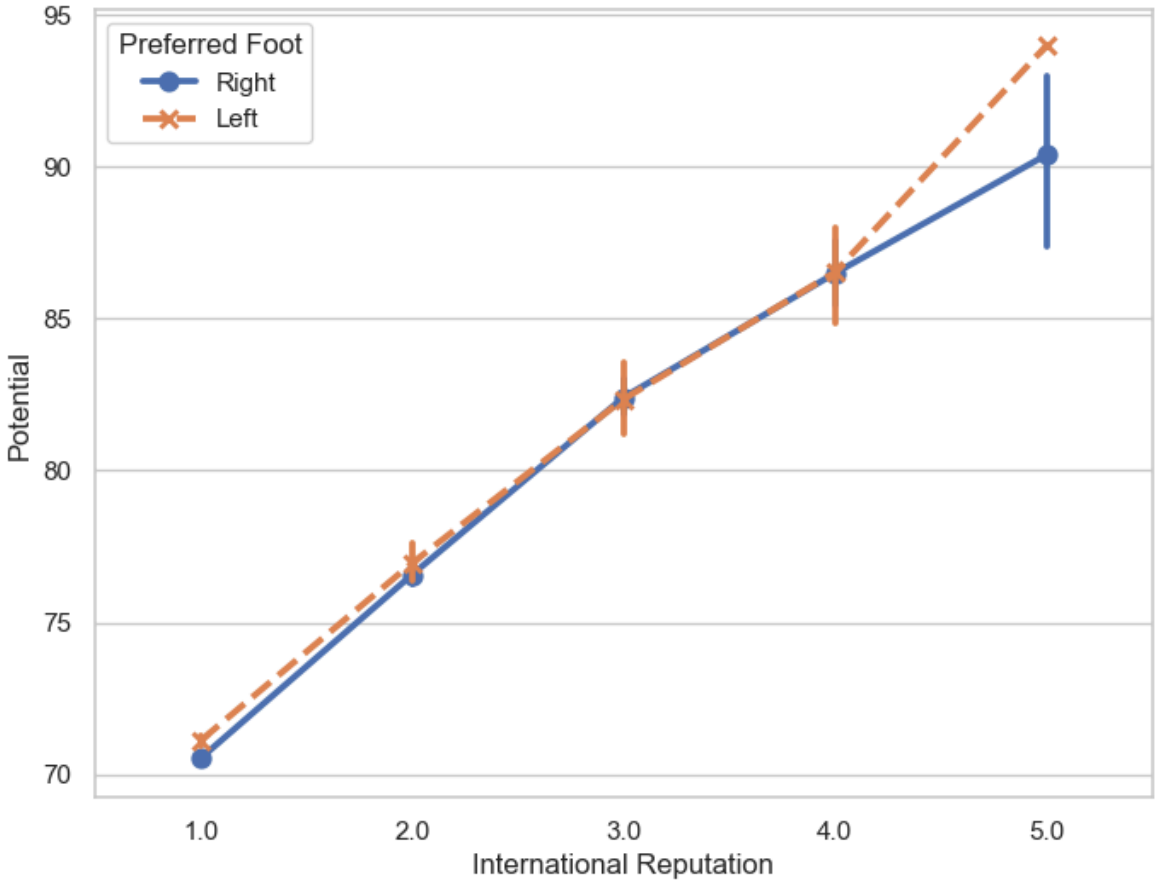
In [101…

```
f,ax=plt.subplots(figsize=(8,6))
sns.pointplot(x='International Reputation',y='Potential',hue='Preferred Foot', d
plt.show()
```



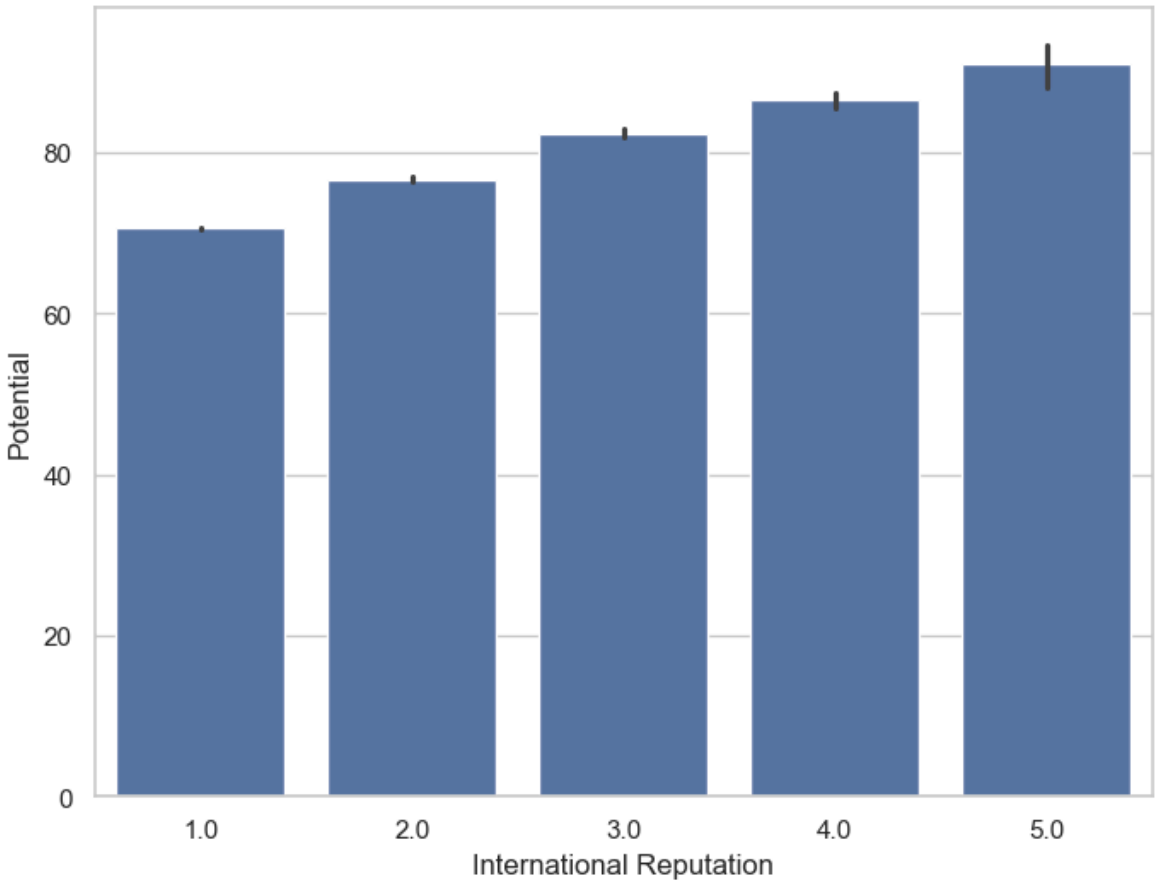
In [115…

```
f,ax=plt.subplots(figsize=(8,6))
sns.pointplot(x='International Reputation',y='Potential',hue='Preferred Foot',
              data=fifa19, markers=["o","x"],linestyles=['-','--'])
plt.show()
```



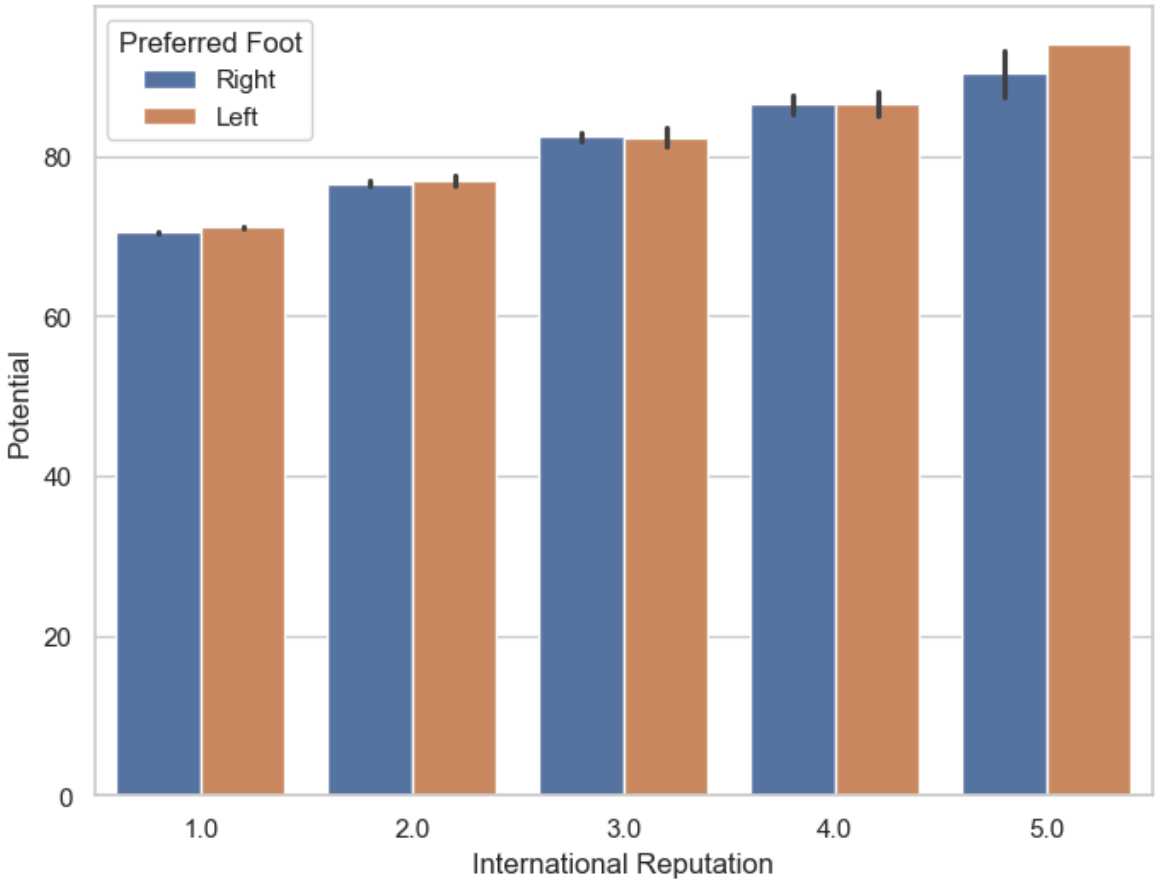
In [117…

```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential', data=fifa19)
plt.show()
```



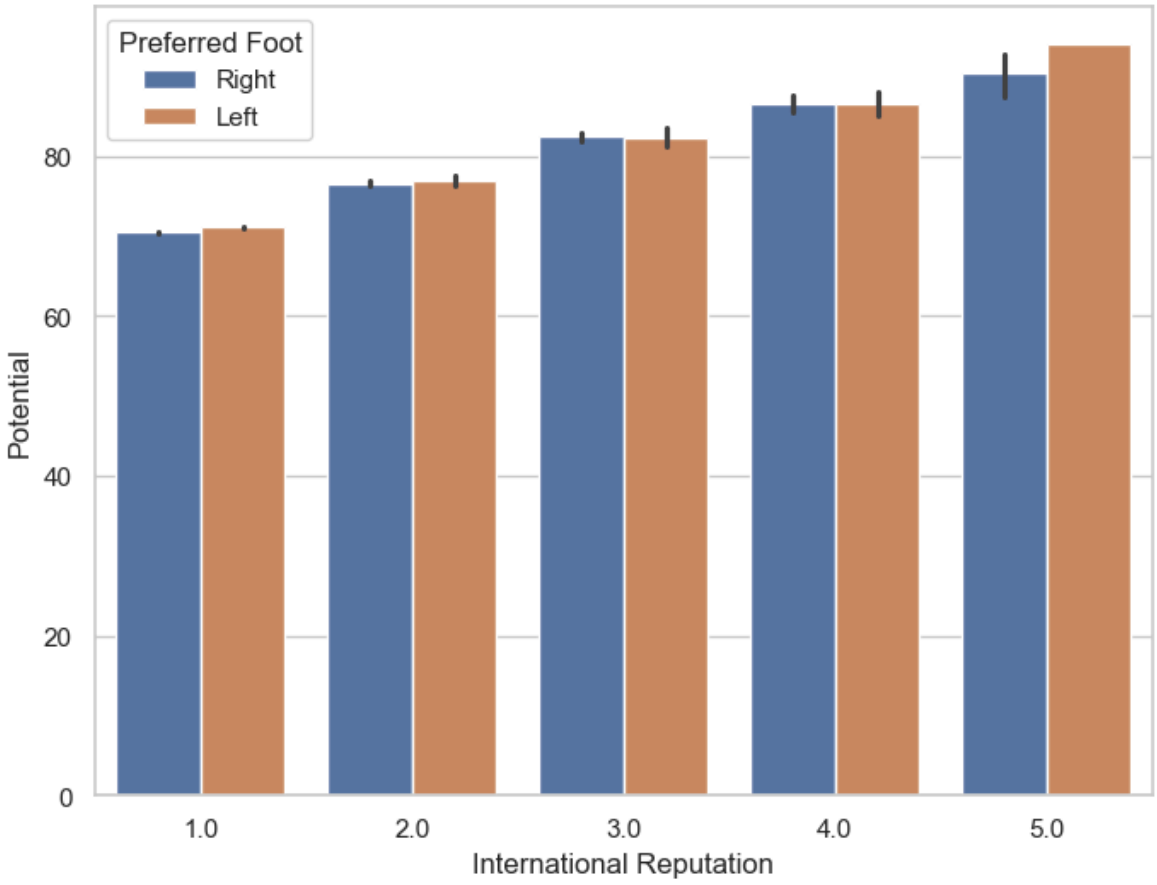
In [119…

```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential',hue='Preferred Foot', dat
plt.show()
```



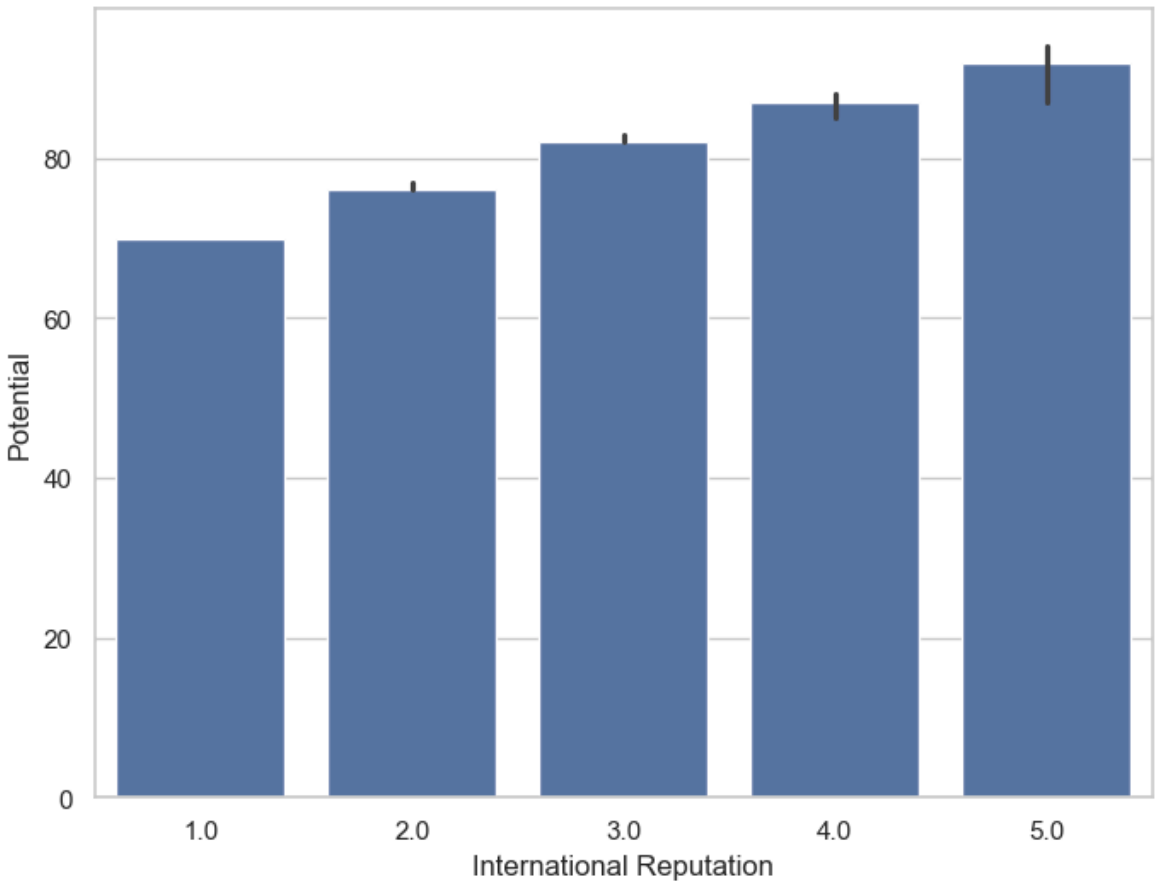
In [121…

```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential',hue='Preferred Foot', dat
plt.show()
```

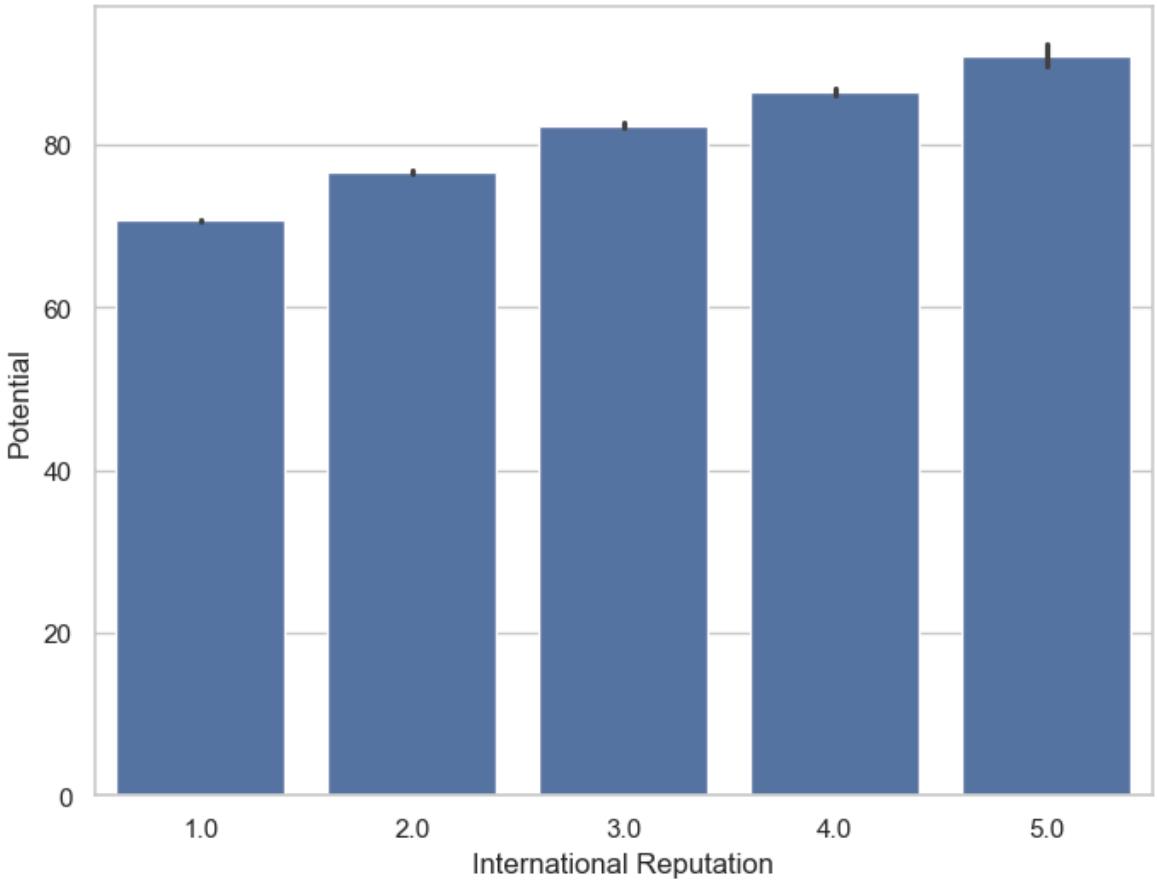


In [125…

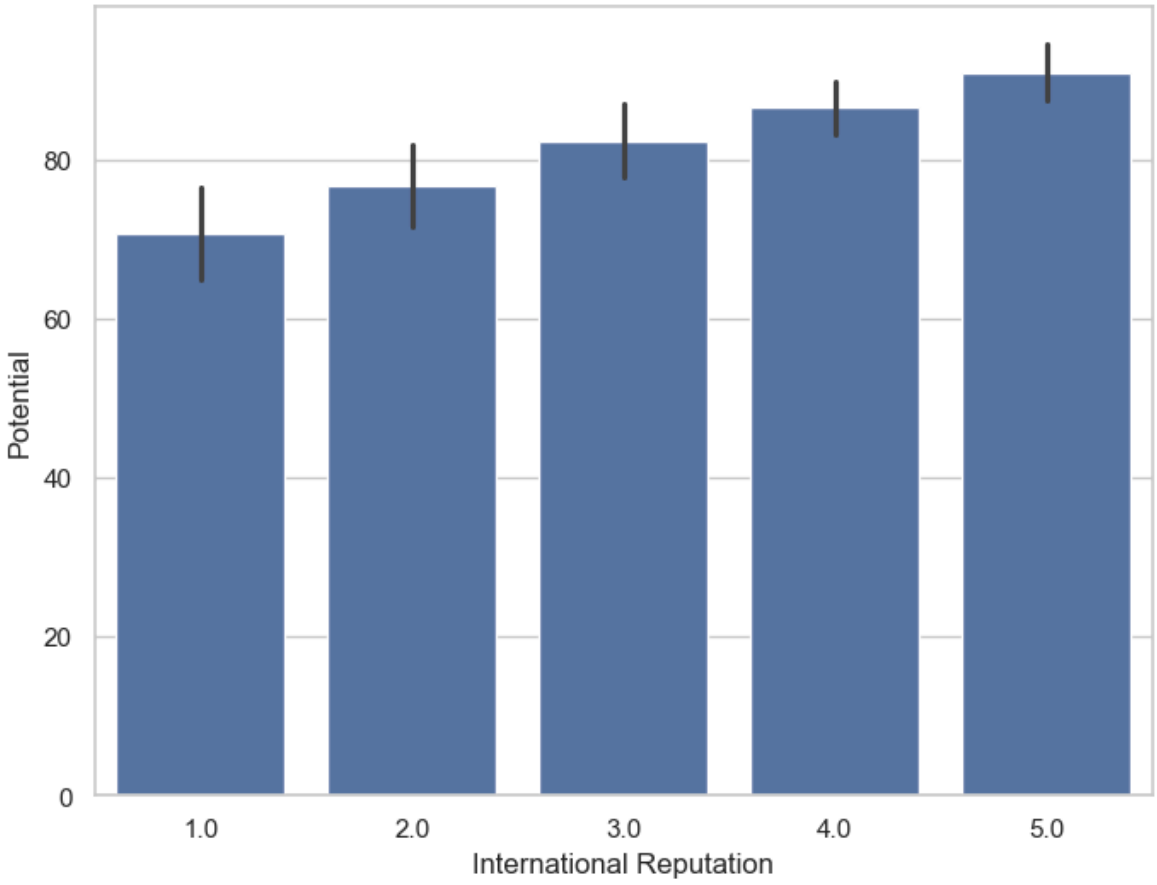
```
from numpy import median
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential', data=fifa19,estimator=me
plt.show()
```



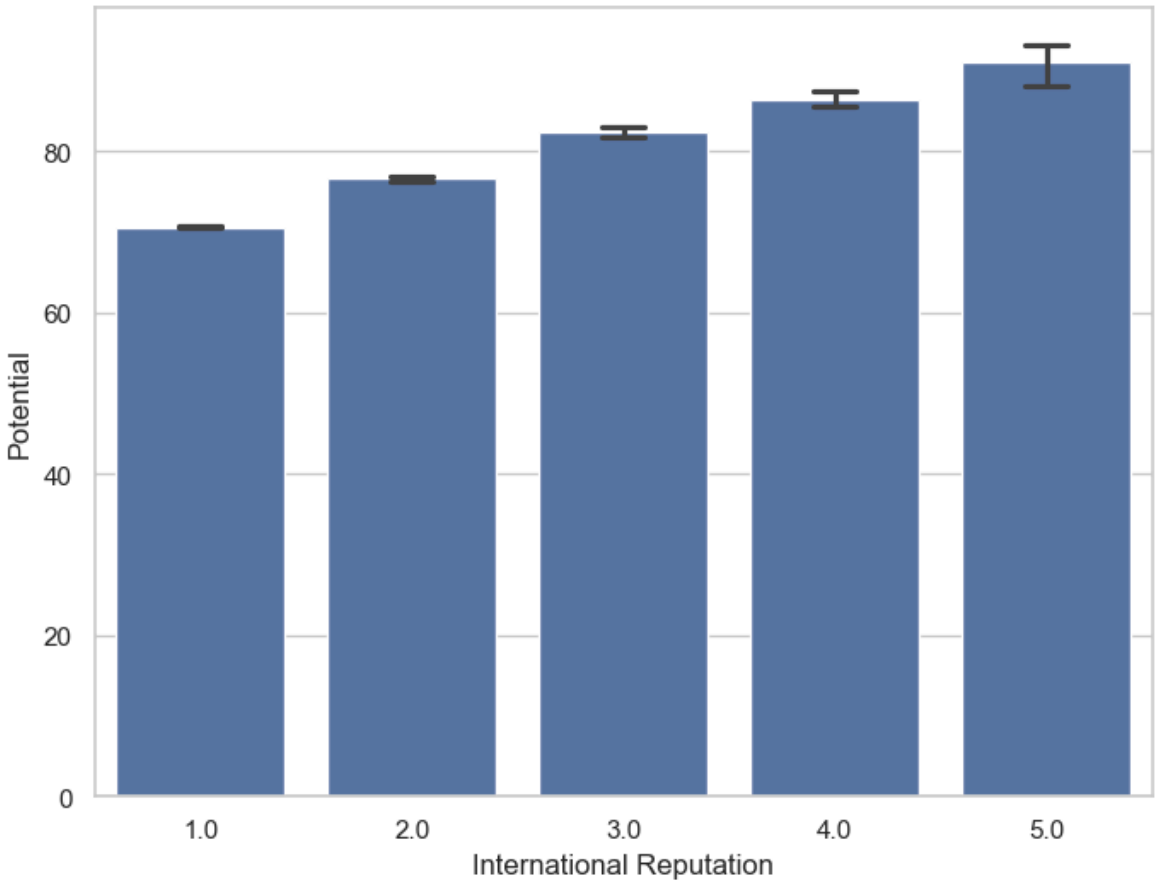
In [129…
```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential', data=fifa19,ci=68)
plt.show()
```



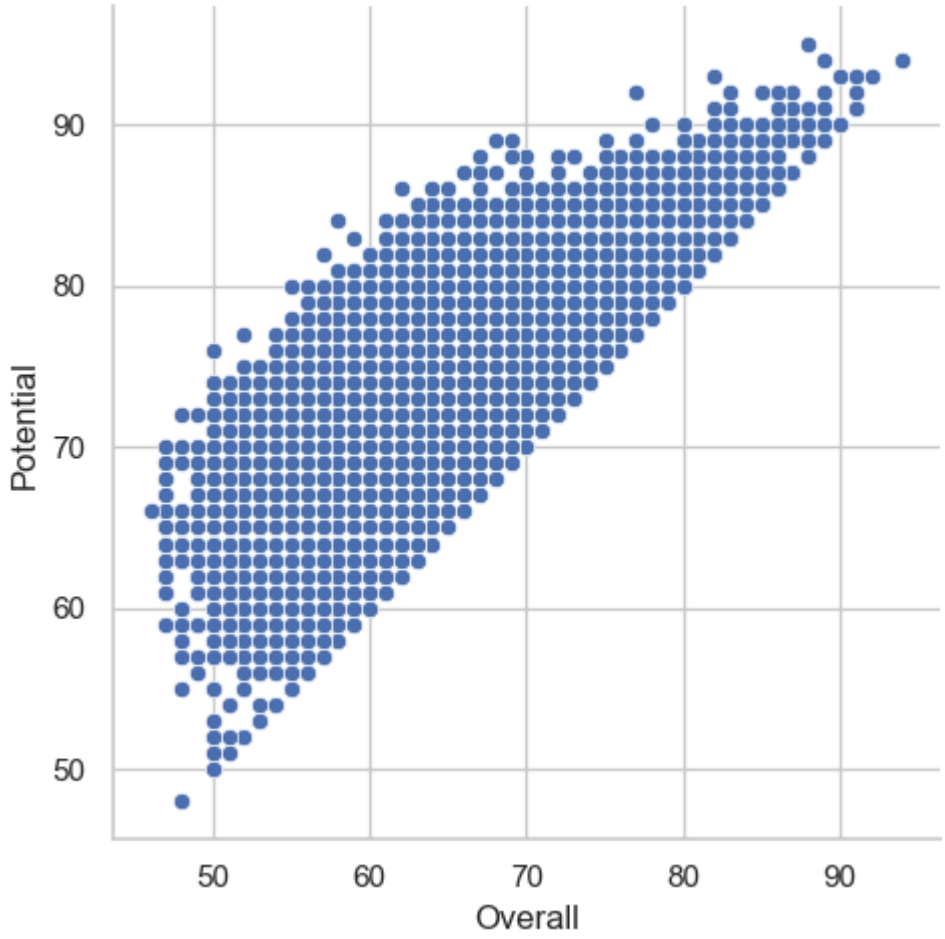
In [133…
```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential', data=fifa19,ci='sd')
plt.show()
```



In [135…
```
f,ax=plt.subplots(figsize=(8,6))
sns.barplot(x='International Reputation',y='Potential', data=fifa19,capsize=0.2)
plt.show()
```

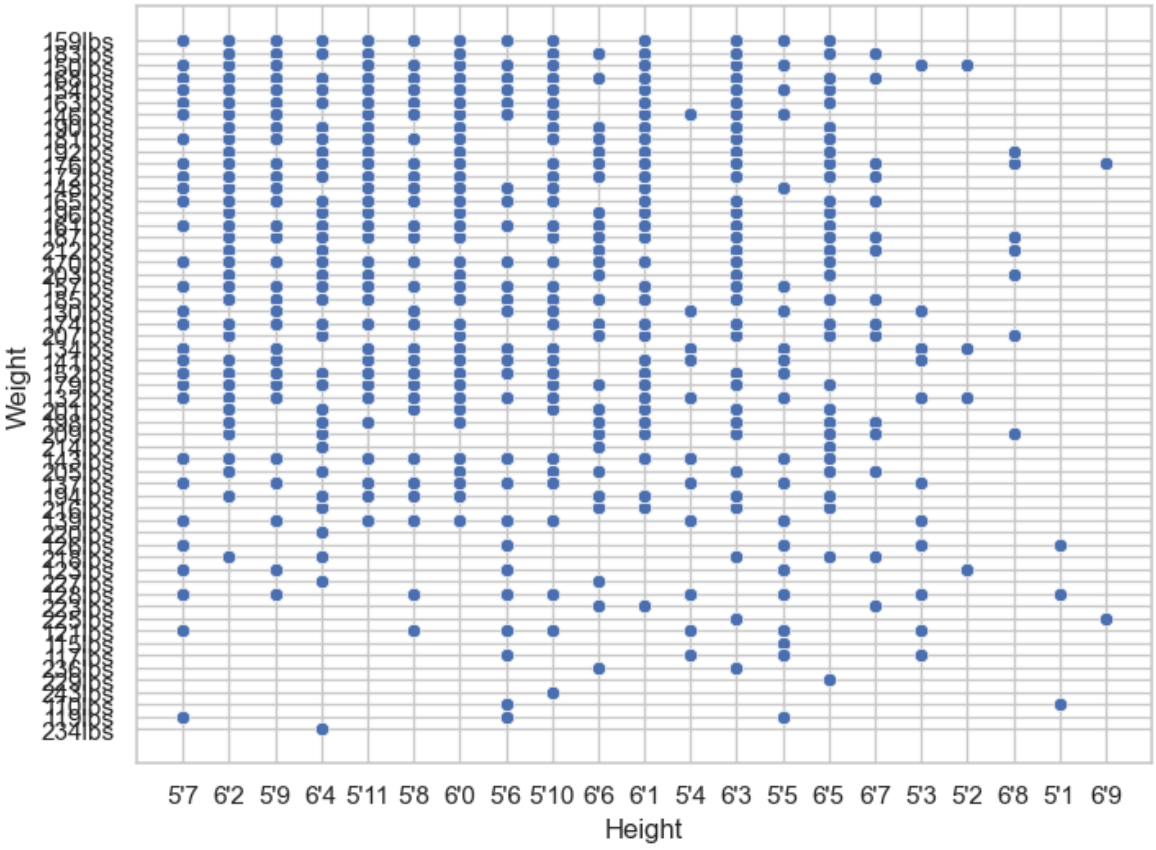


In [137…
```
g=sns.relplot(x='Overall',y='Potential',data=fifa19)
```

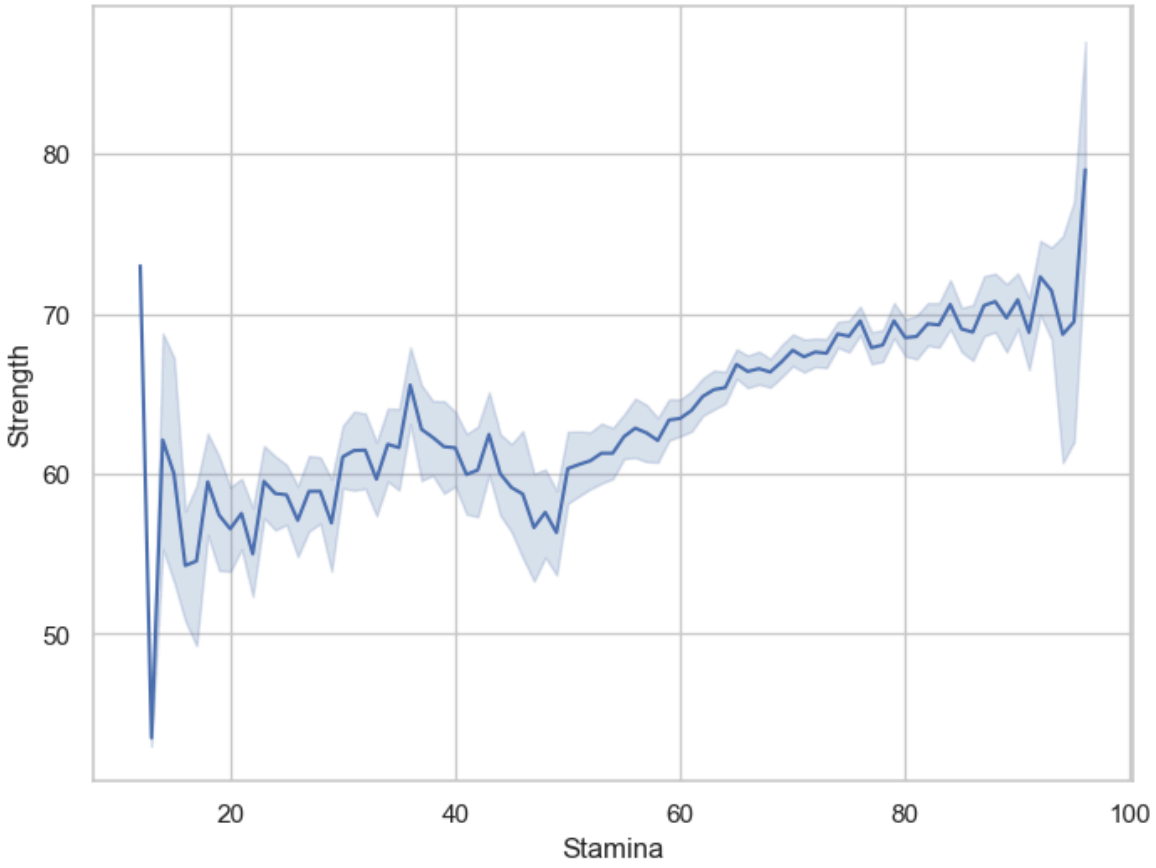


In [139…

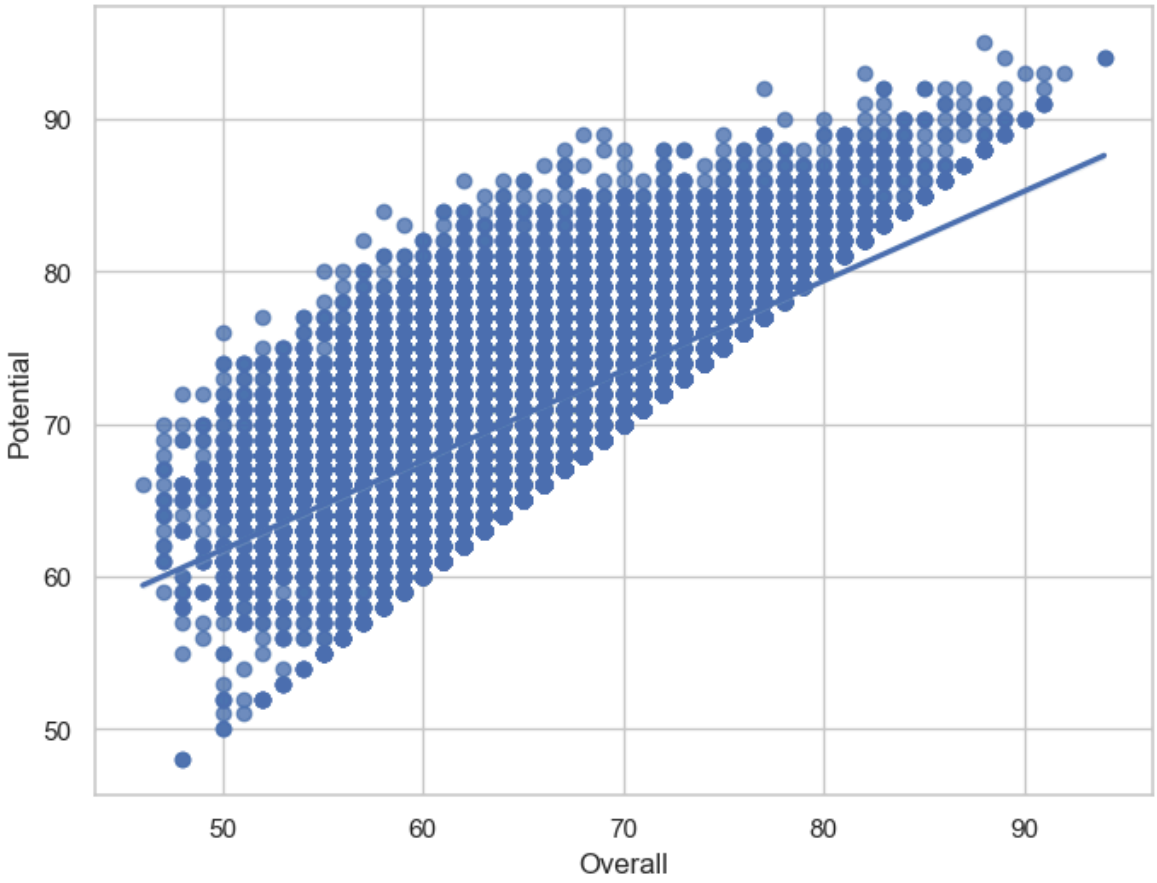
```
f,ax=plt.subplots(figsize=(8,6))
sns.scatterplot(x='Height', y='Weight',data=fifa19)
plt.show()
```



In [145…
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.lineplot(x='Stamina', y='Strength',data=fifa19)
plt.show()
```

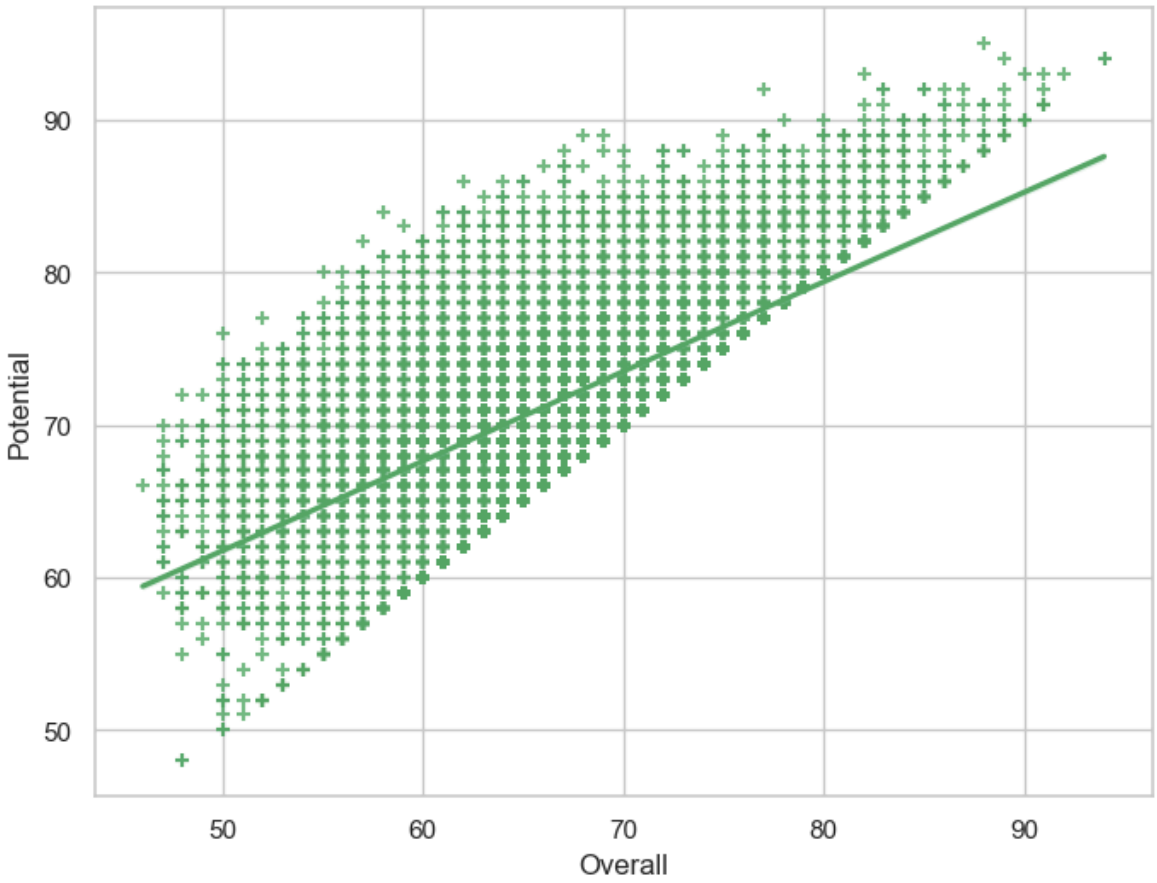


In [147…
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.regplot(x='Overall', y='Potential',data=fifa19)
plt.show()
```

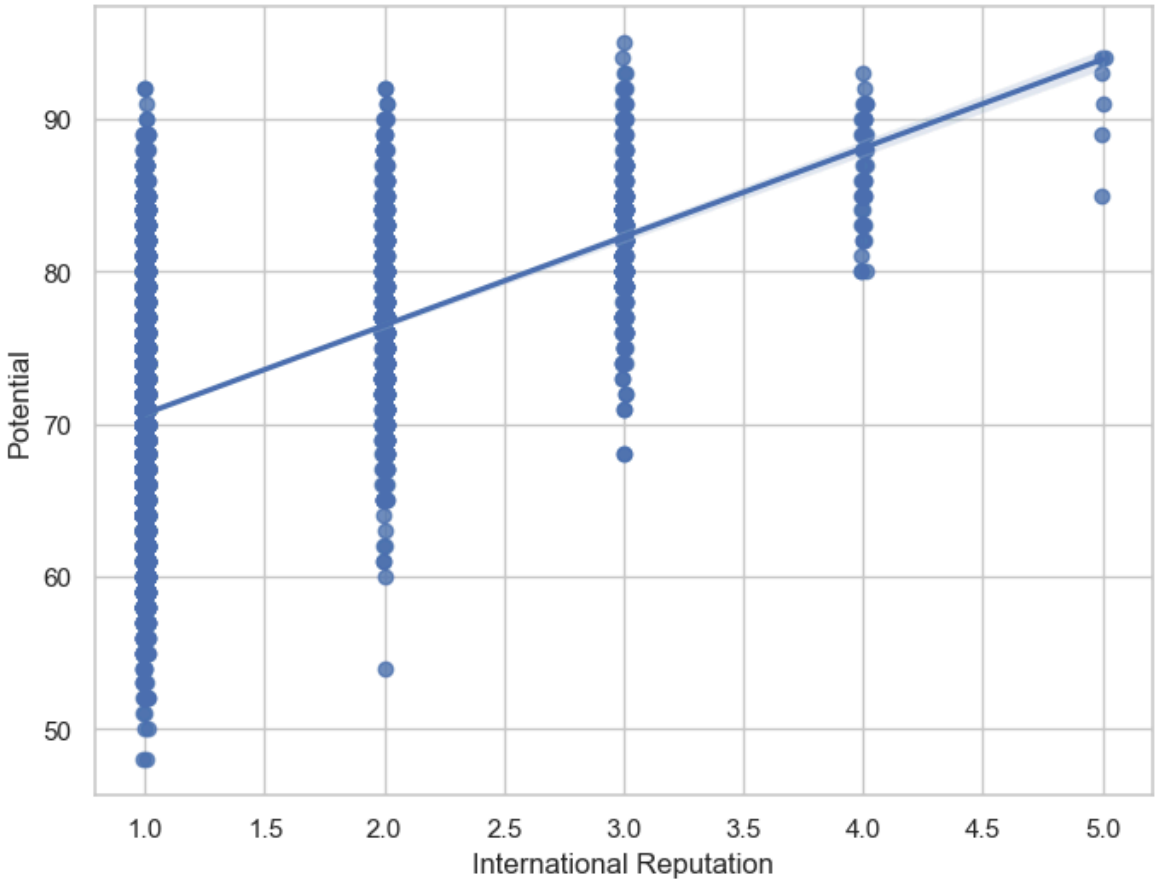


In [149…

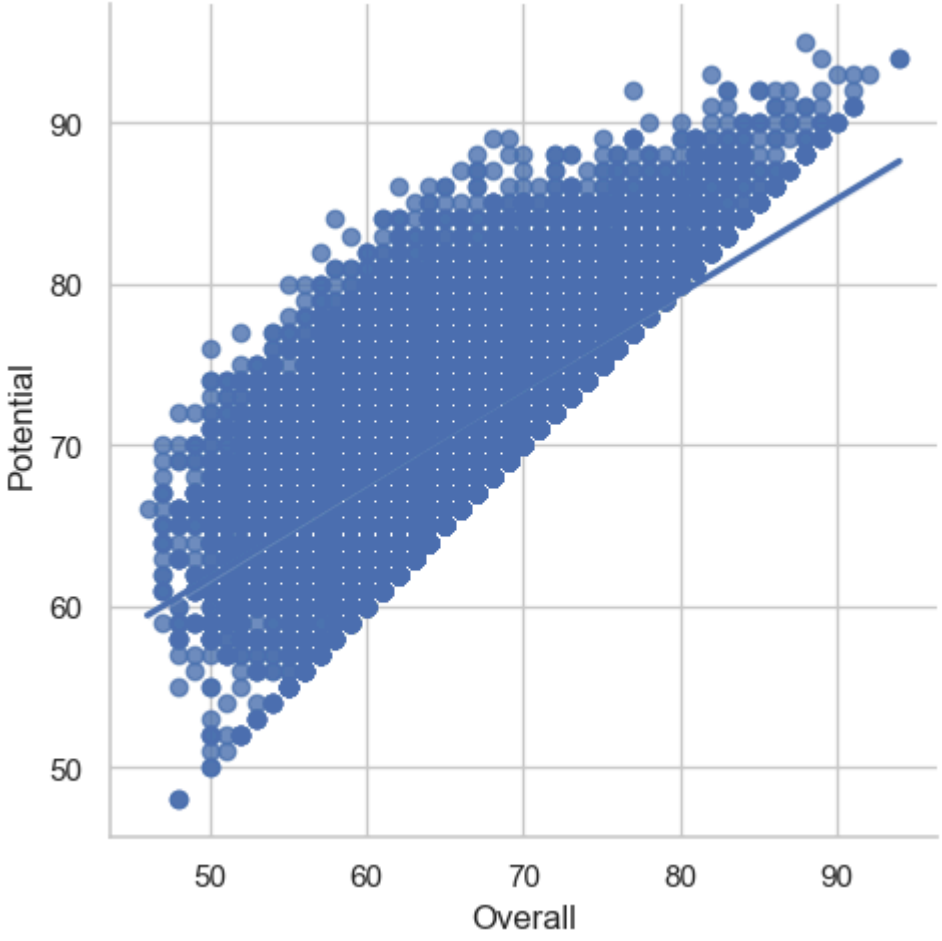
```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.regplot(x='Overall', y='Potential',data=fifa19,color='g',marker='+')
plt.show()
```



In [155…
```
f,ax=plt.subplots(figsize=(8,6))
sns.regplot(x='International Reputation', y='Potential',data=fifa19,x_jitter=.01
plt.show()
```

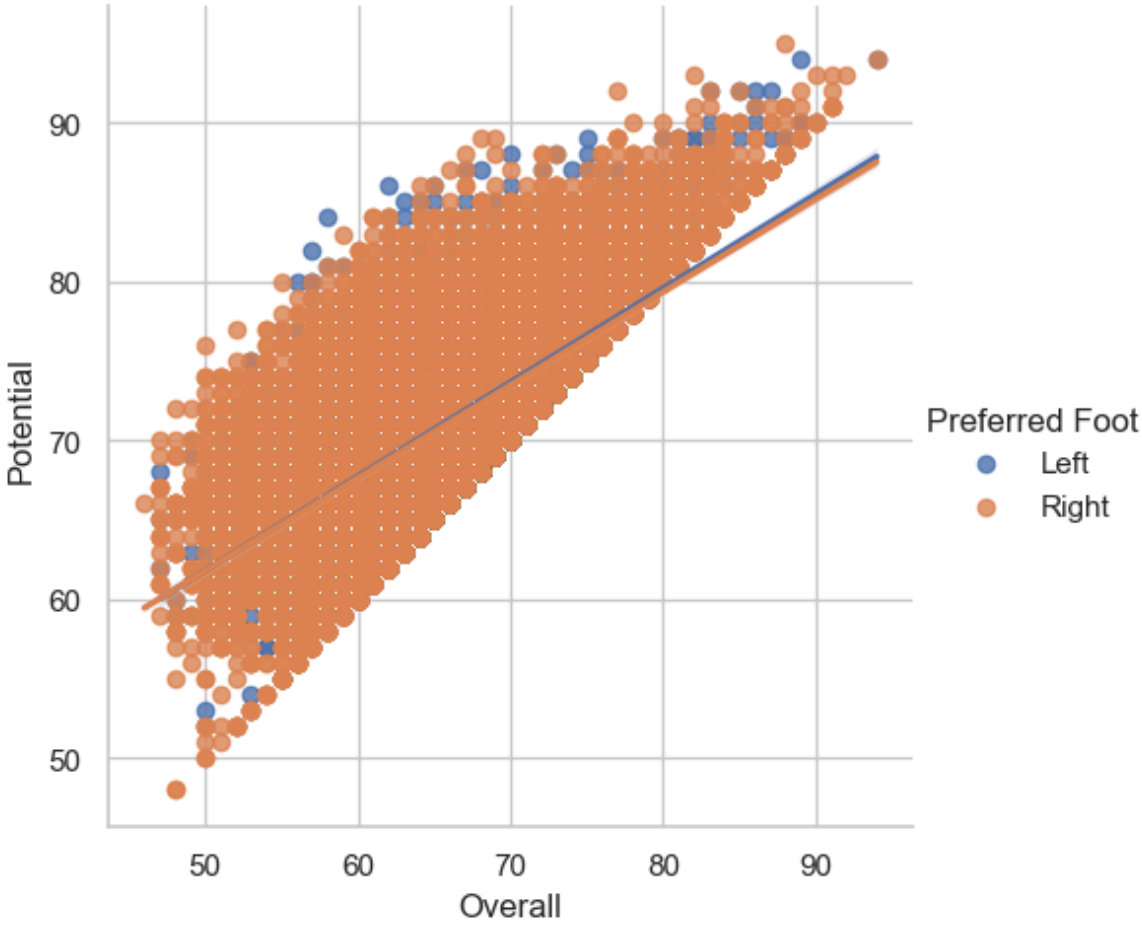


In [157…
```
ax=sns.lmplot(x='Overall', y='Potential',data=fifa19)
```

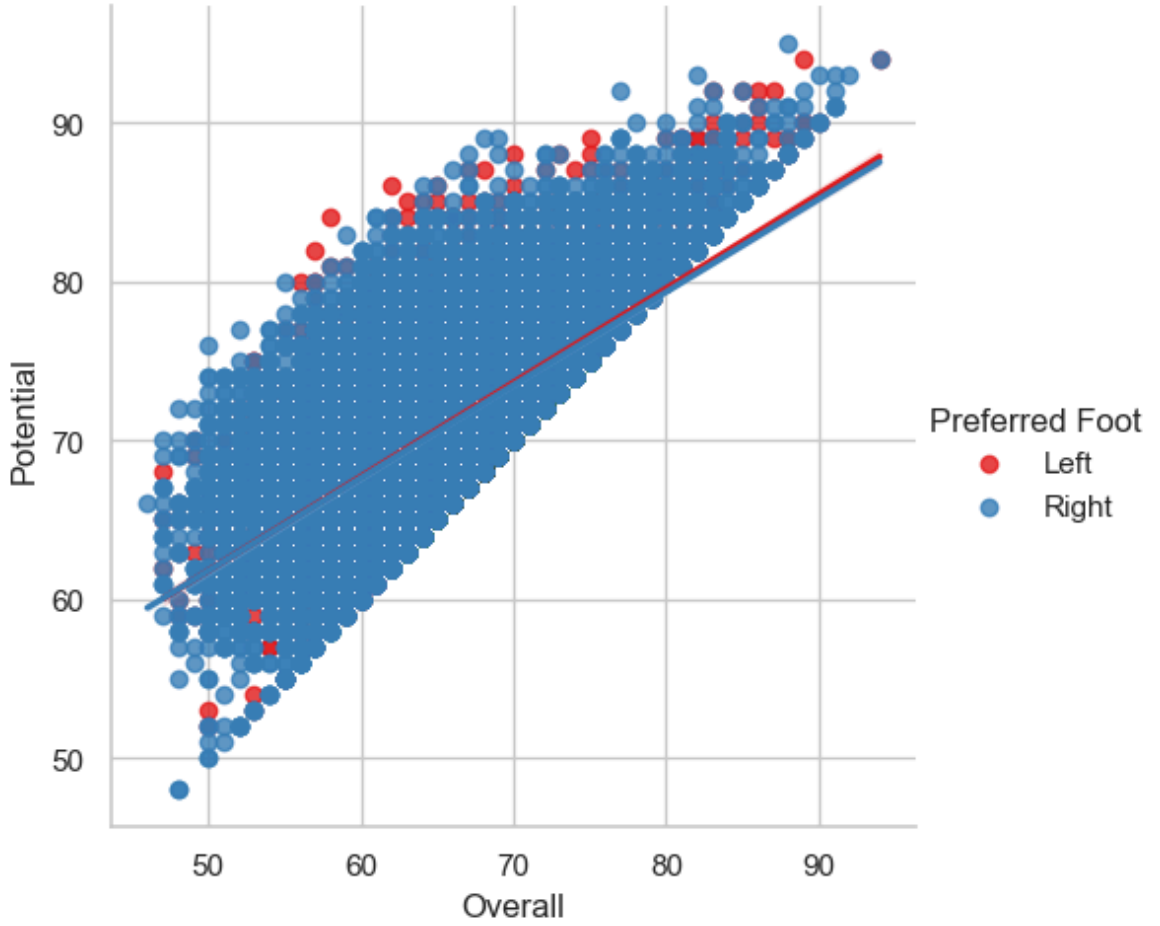


In [159…

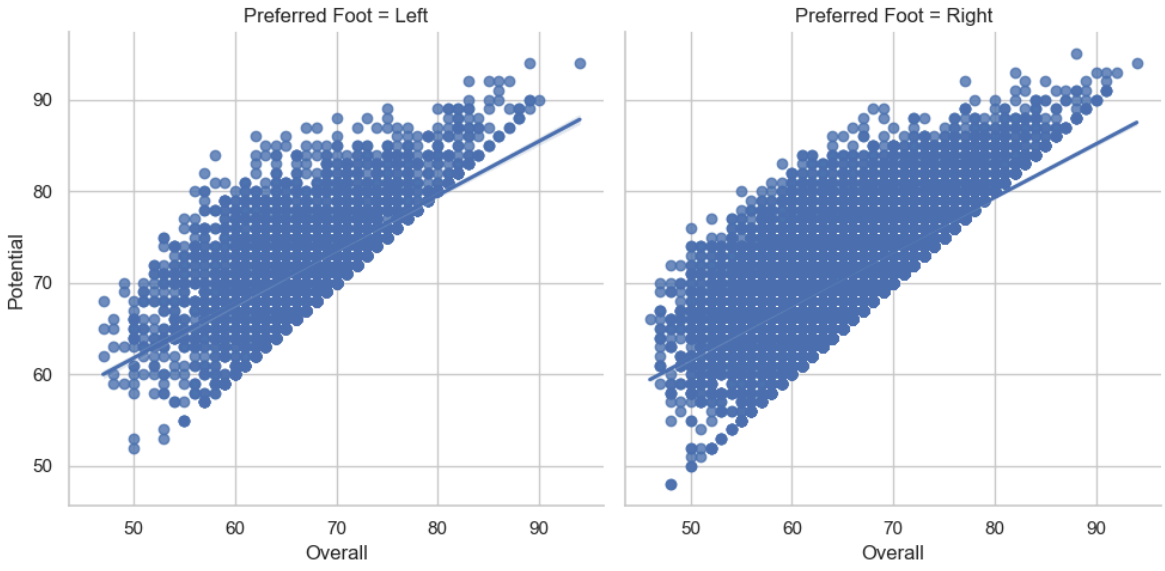
```
g=sns.lmplot(x='Overall', y='Potential',hue='Preferred Foot',data=fifa19)
```



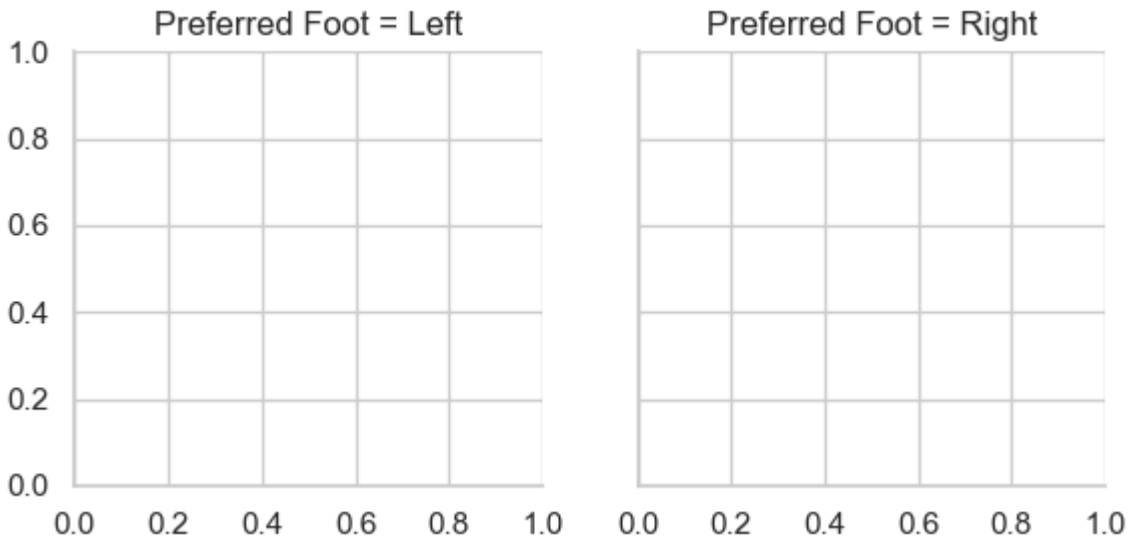
In [163…
```
g=sns.lmplot(x='Overall', y='Potential',hue='Preferred Foot',data=fifa19,palette
```



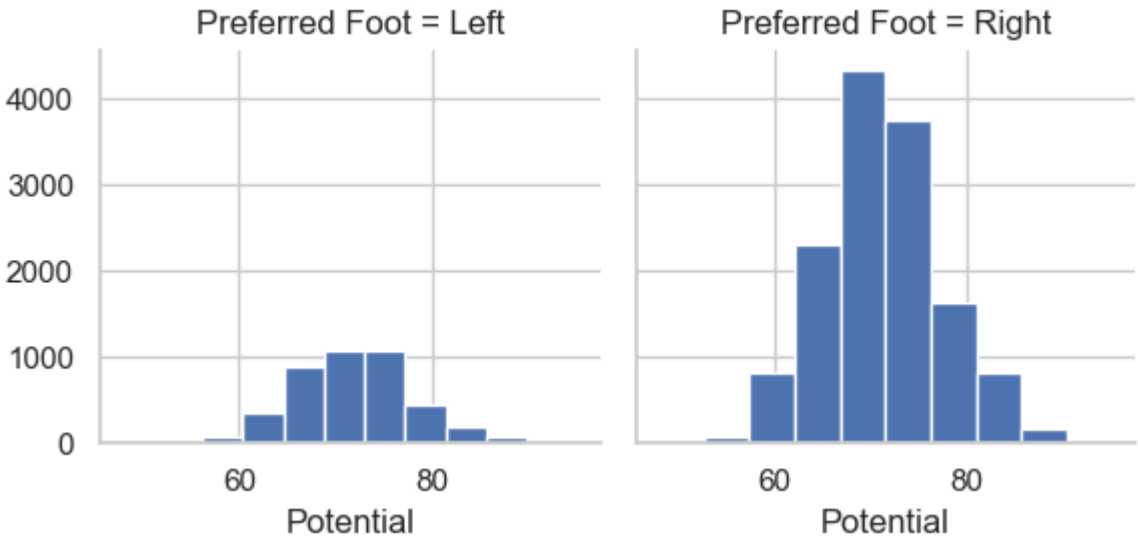
In [167…
```
g=sns.lmplot(x='Overall', y='Potential',col='Preferred Foot',data=fifa19)
```



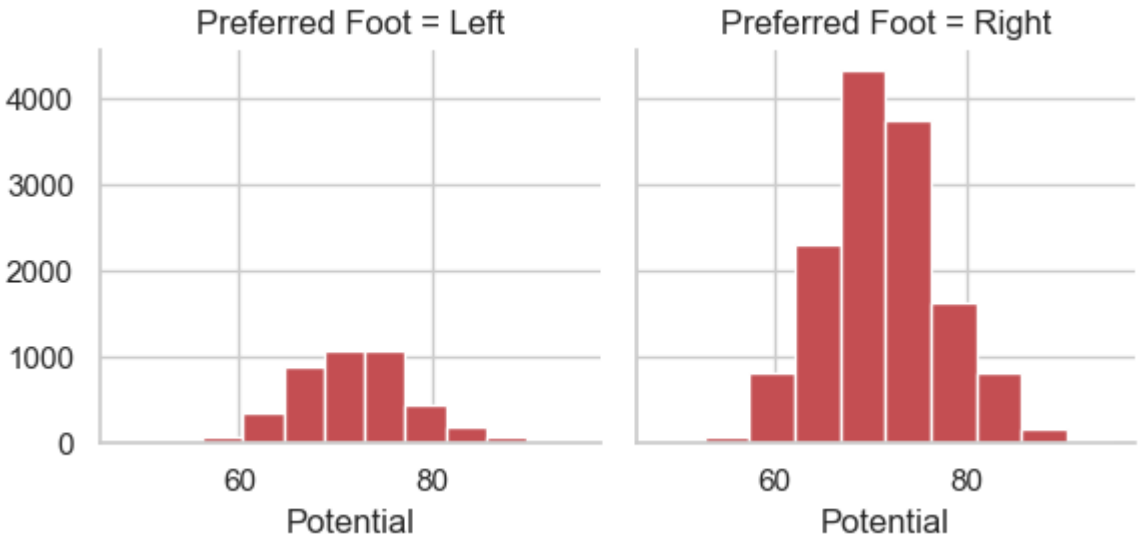
In [171…
```
g=sns.FacetGrid(fifa19,col='Preferred Foot')
```



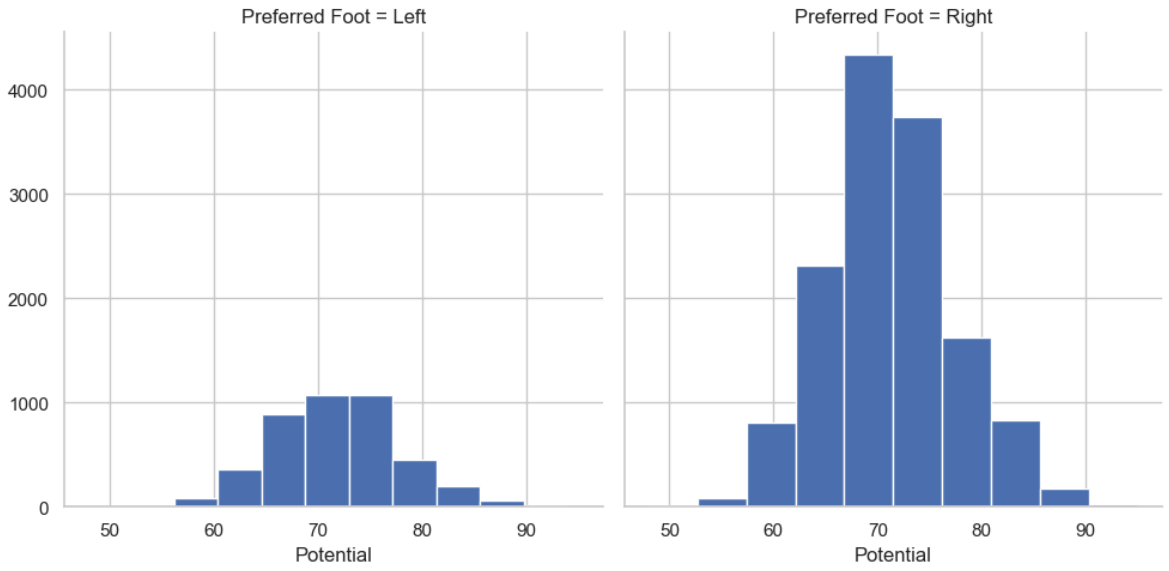
In [177…
```
g=sns.FacetGrid(fifa19,col='Preferred Foot')
g=g.map(plt.hist,'Potential')
```



In [179…
```
g=sns.FacetGrid(fifa19,col='Preferred Foot')
g=g.map(plt.hist,'Potential',bins=10,color='r')
```

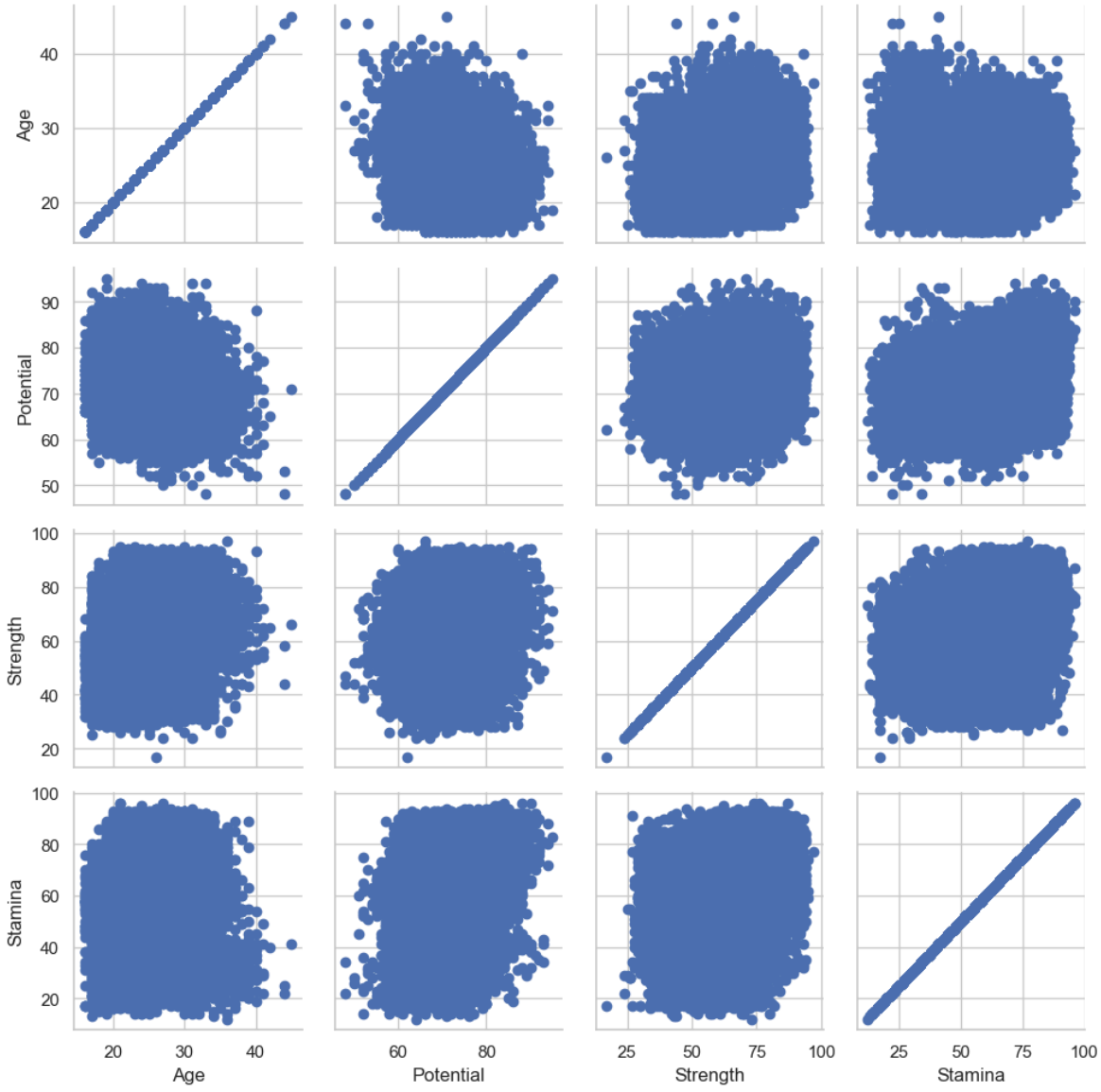


In [181…
```
g=sns.FacetGrid(fifa19,col='Preferred Foot',height=5,aspect=1)
g=g.map(plt.hist,'Potential')
```



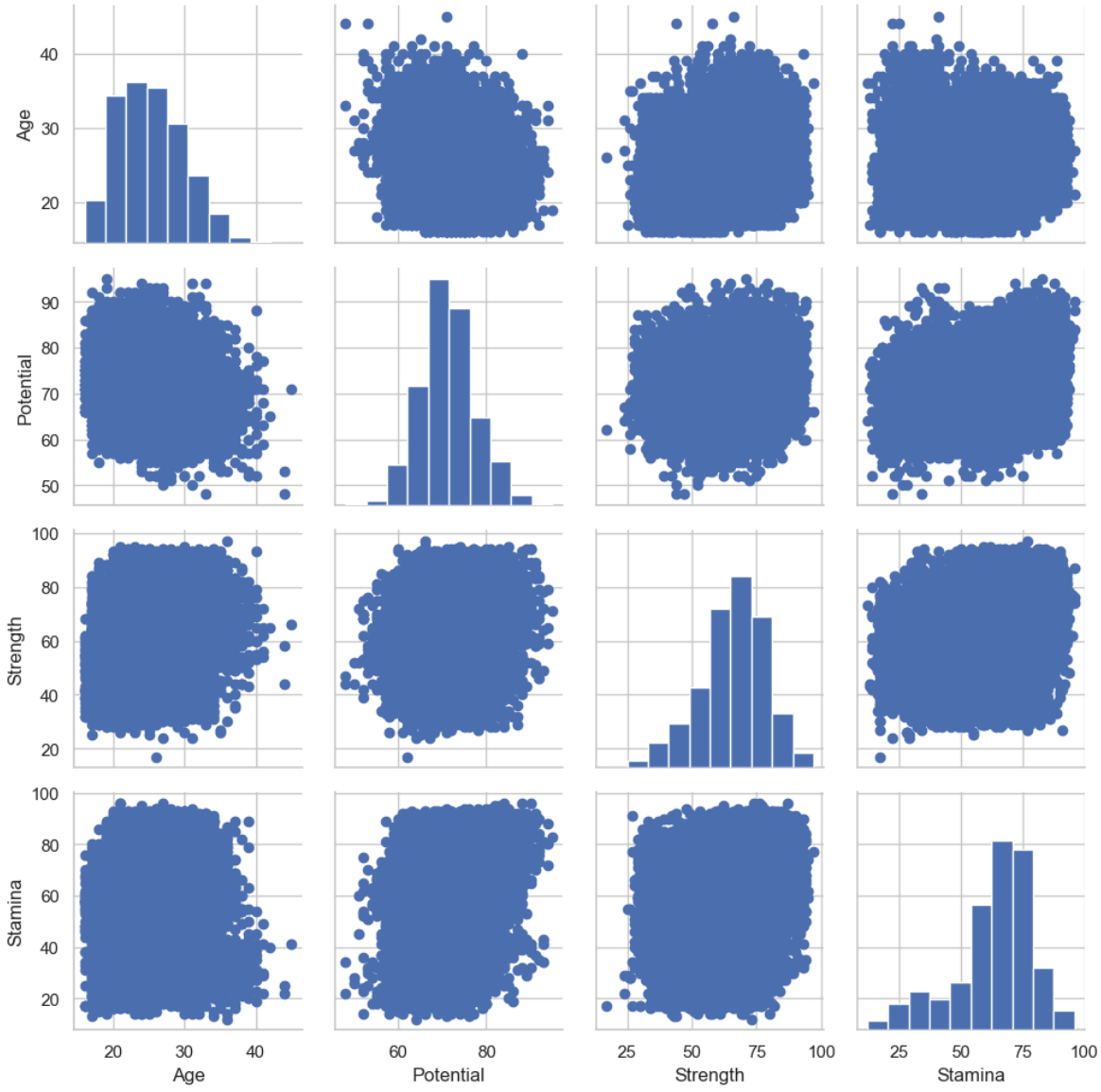
In [183…
```
fifa19_new=fifa19[['Age','Potential','Strength','Stamina','Preferred Foot']]
```

In [185…
```
g=sns.PairGrid(fifa19_new)
g=g.map(plt.scatter)
```



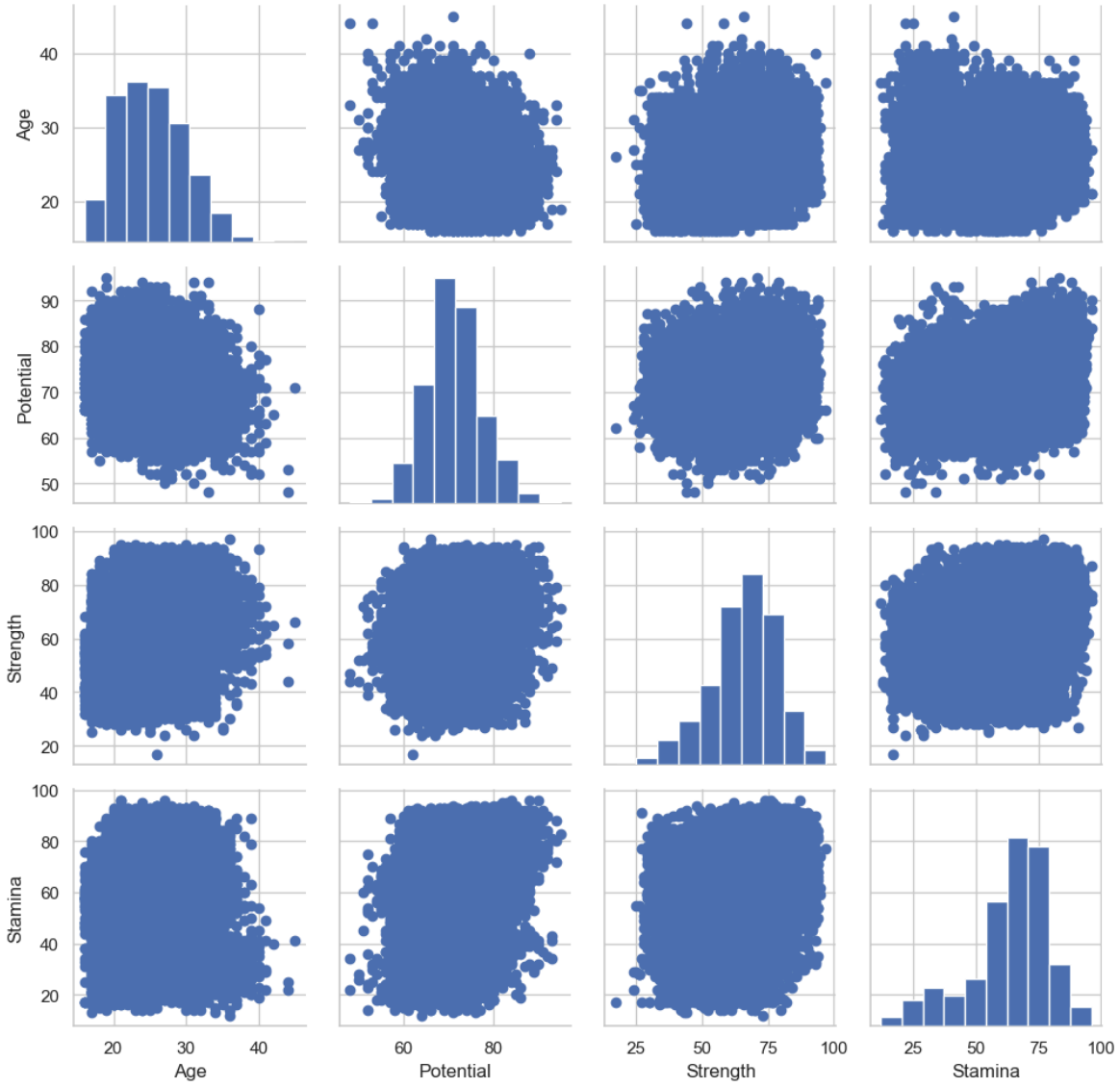
In [187…

```
g=sns.PairGrid(fifa19_new)
g=g.map_diag(plt.hist)
g=g.map_offdiag(plt.scatter)
```



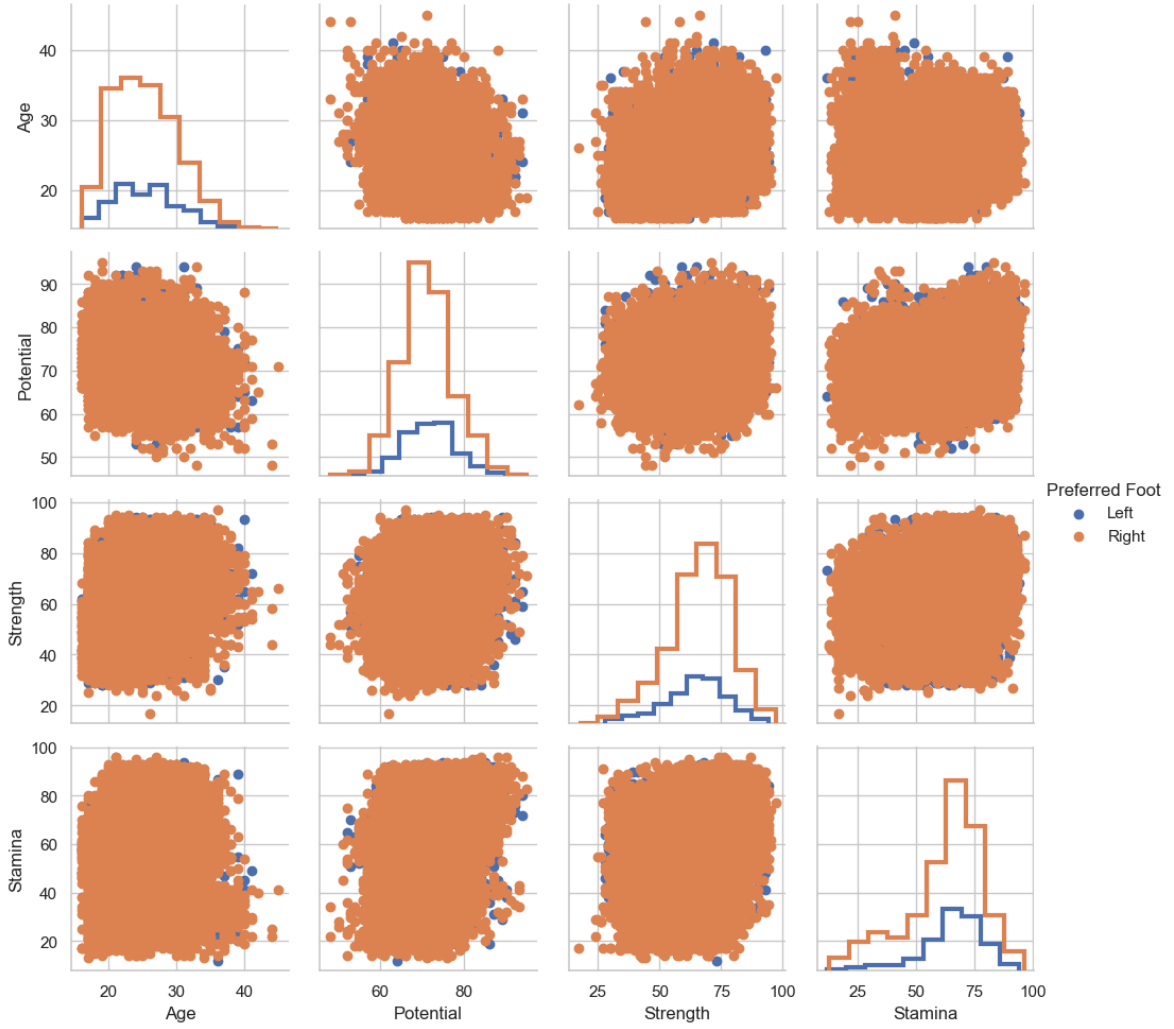
In [189…

```
g=sns.PairGrid(fifa19_new)
g=g.map_diag(plt.hist)
g=g.map_offdiag(plt.scatter)
g=g.add_legend()
```



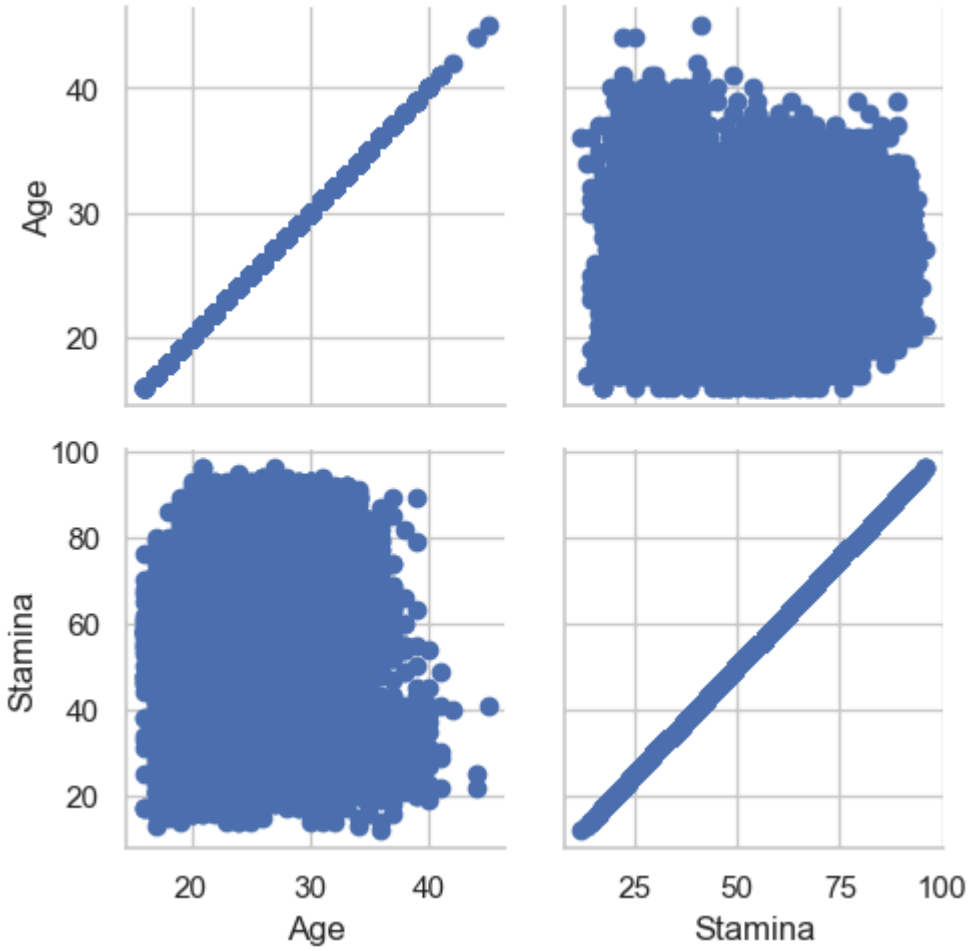
In [191…

```
g=sns.PairGrid(fifa19_new,hue='Preferred Foot')
g=g.map_diag(plt.hist,histtype='step',linewidth=3)
g=g.map_offdiag(plt.scatter)
g=g.add_legend()
```



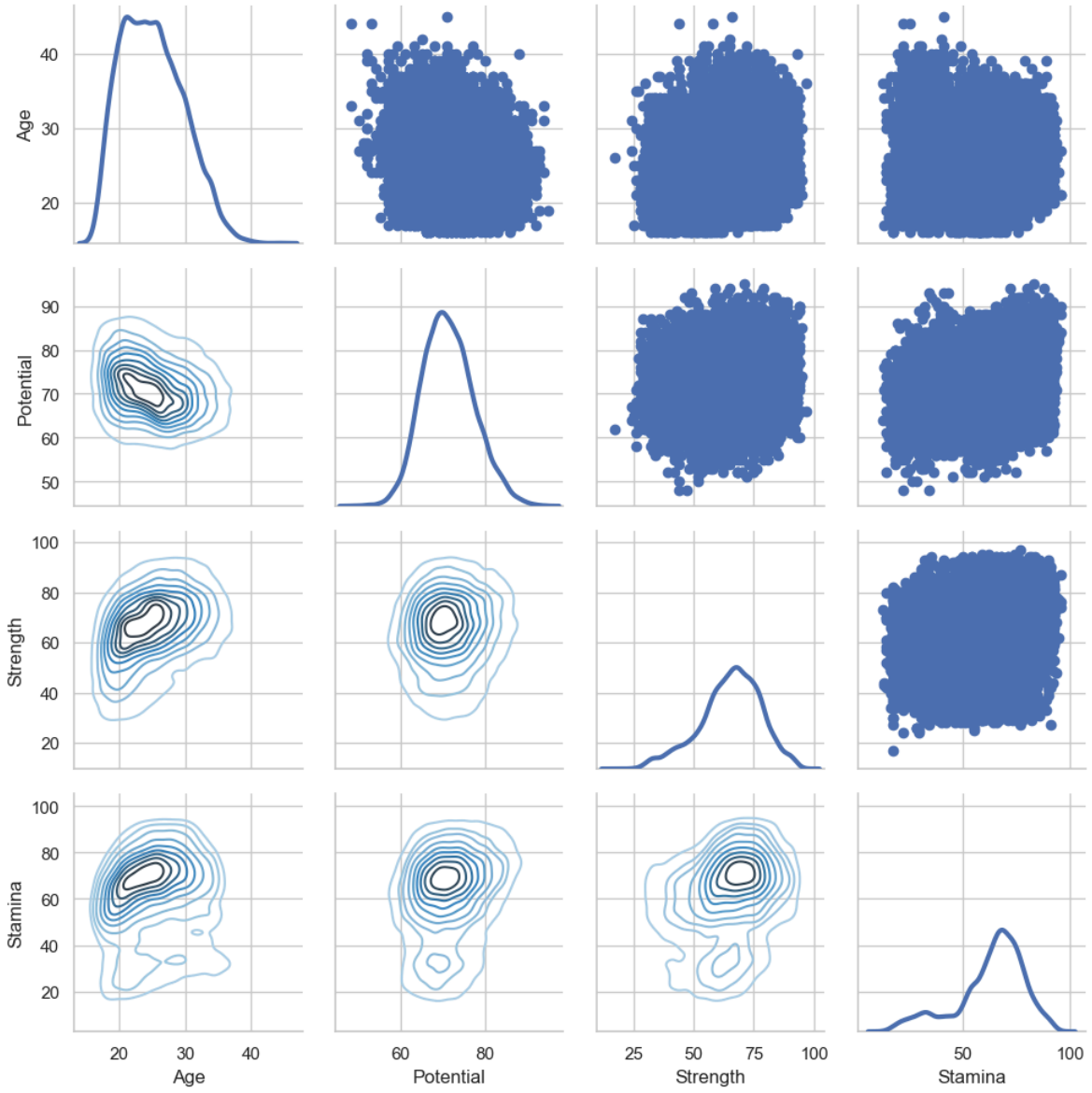
In [193…

```
g=sns.PairGrid(fifa19_new,vars=['Age','Stamina'])
g=g.map(plt.scatter)
```



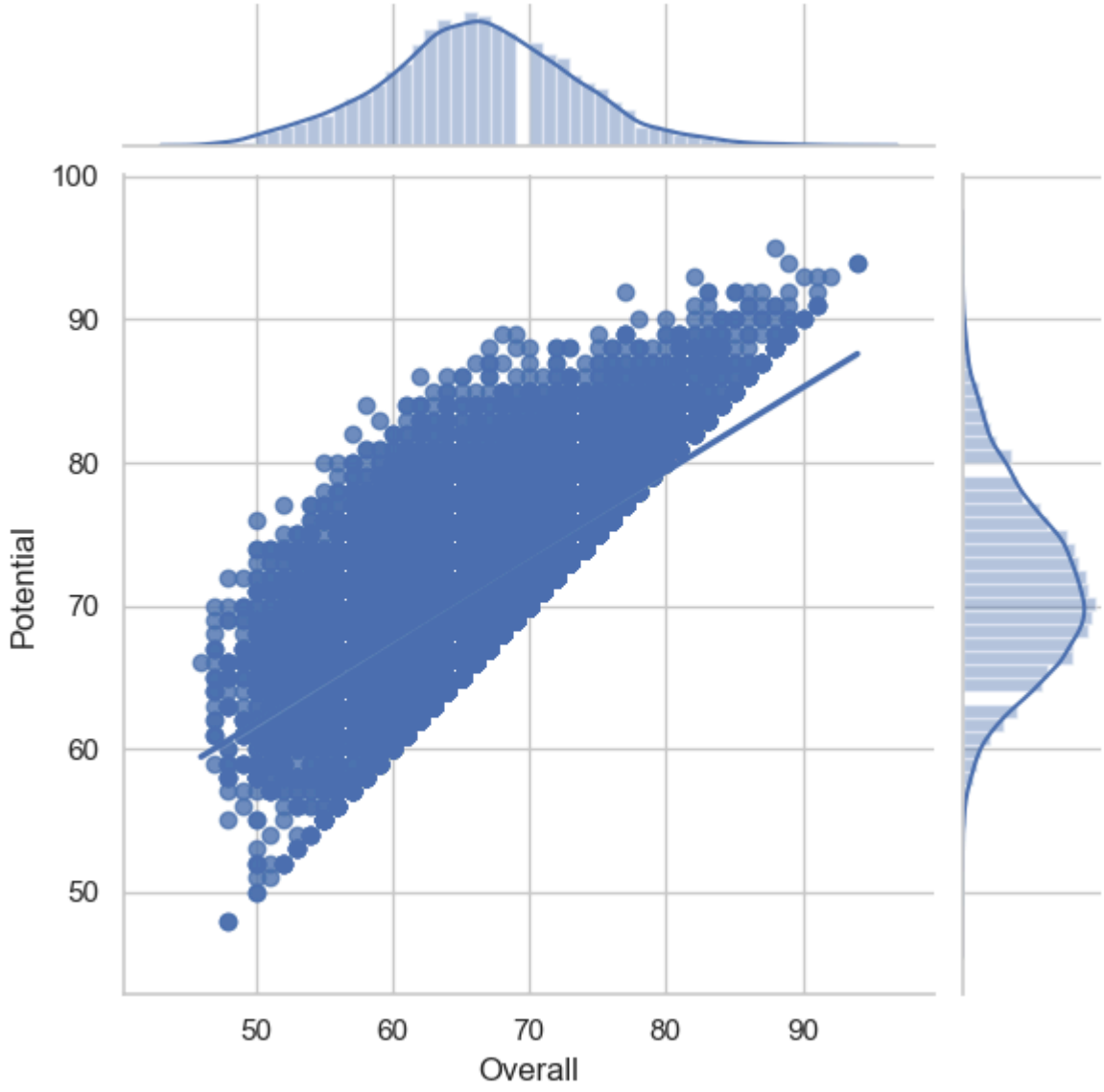
In [198…

```
g=sns.PairGrid(fifa19_new)
g=g.map_upper(plt.scatter)
g=g.map_lower(sns.kdeplot,cmap='Blues_d')
g=g.map_diag(sns.kdeplot,lw=3,legend=False)
```



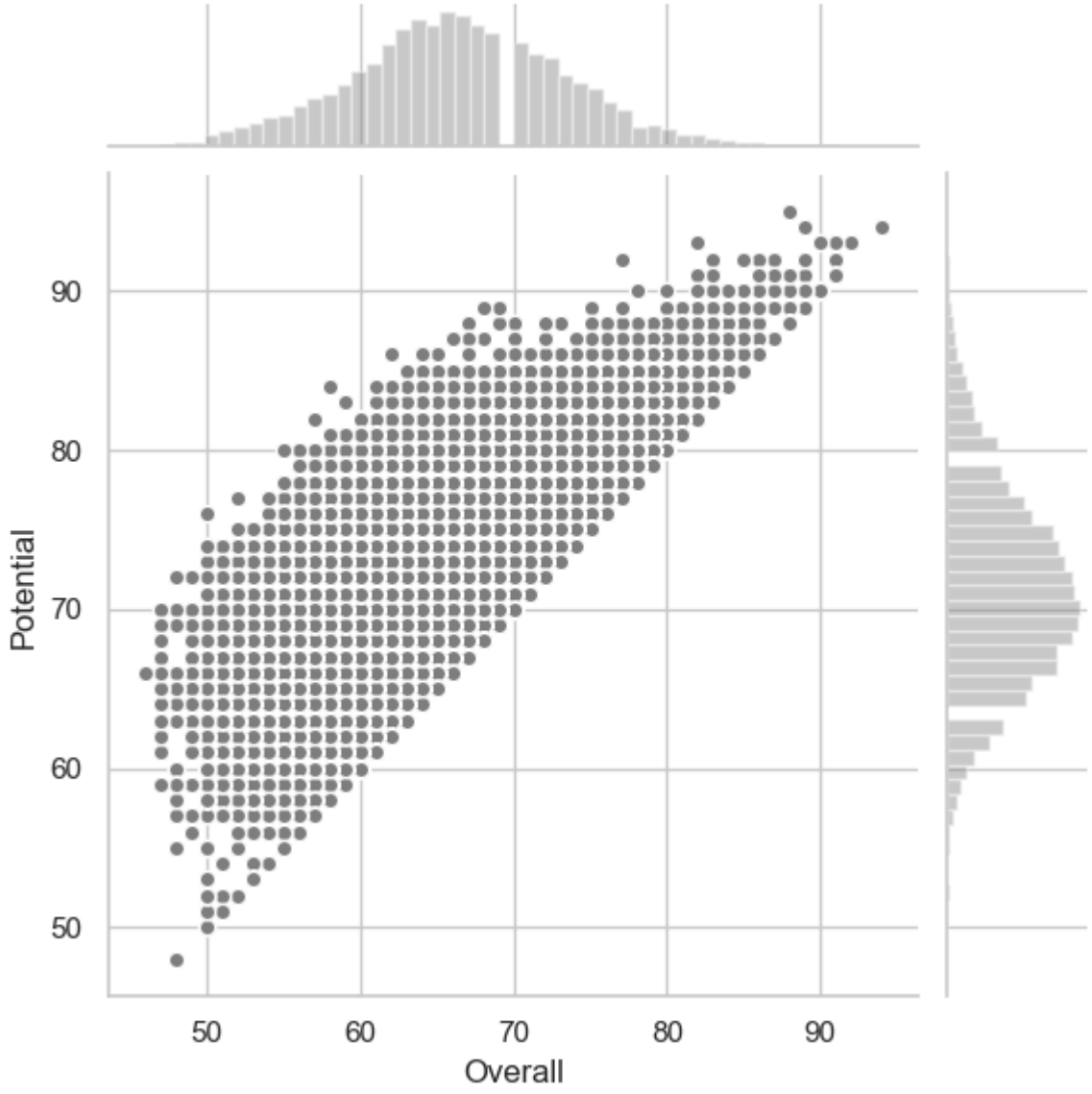
In [200…

```
g=sns.JointGrid(x='Overall',y='Potential',data=fifa19)
g=g.plot(sns.regplot,sns.distplot)
```



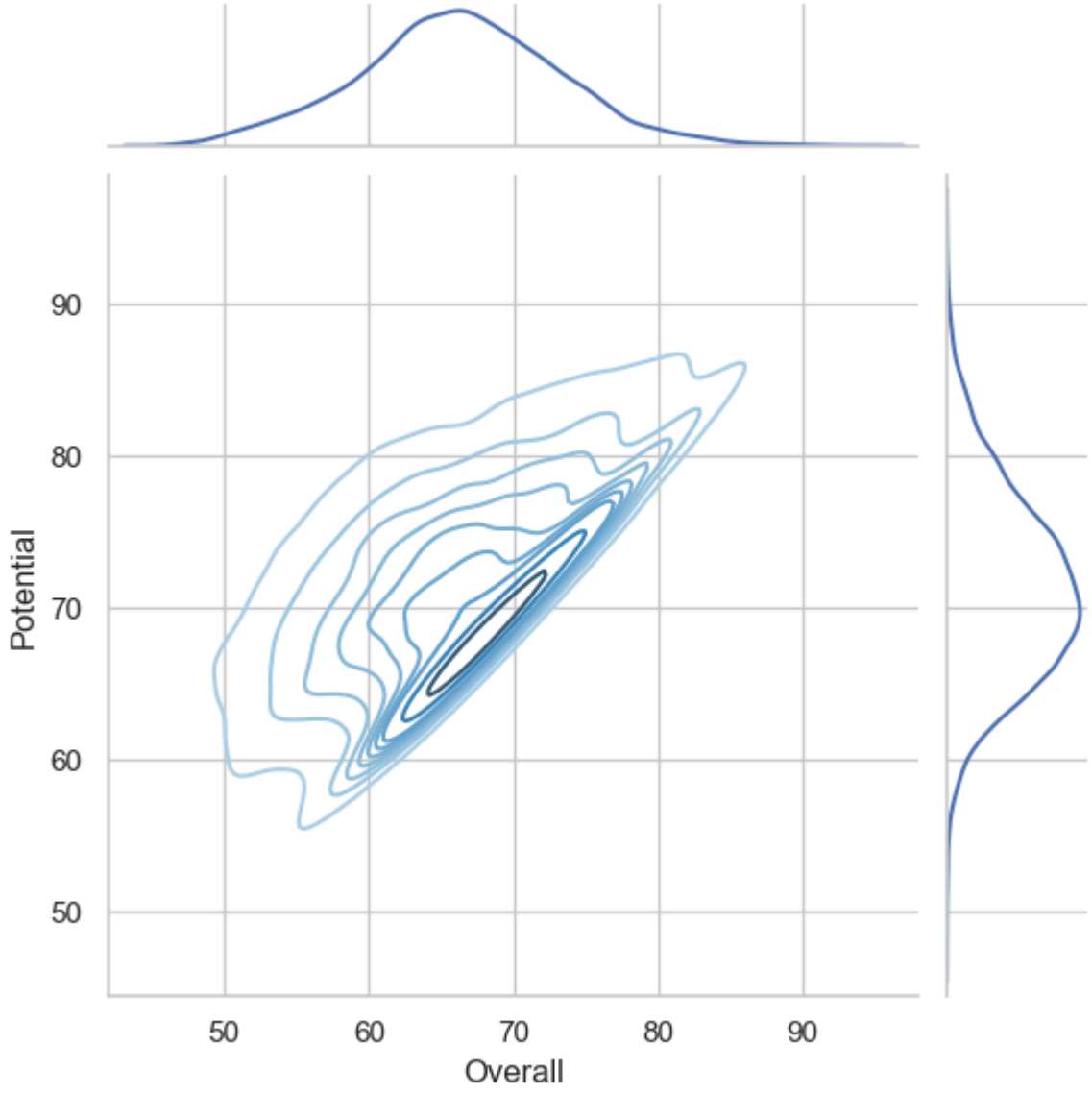
In [202…
```
import matplotlib.pyplot as plt
```

In [206…
```
g=sns.JointGrid(x='Overall',y='Potential',data=fifa19)
g=g.plot_joint(plt.scatter,color='.5',edgecolor='white')
g=g.plot_marginals(sns.distplot,kde=False,color='.5')
```



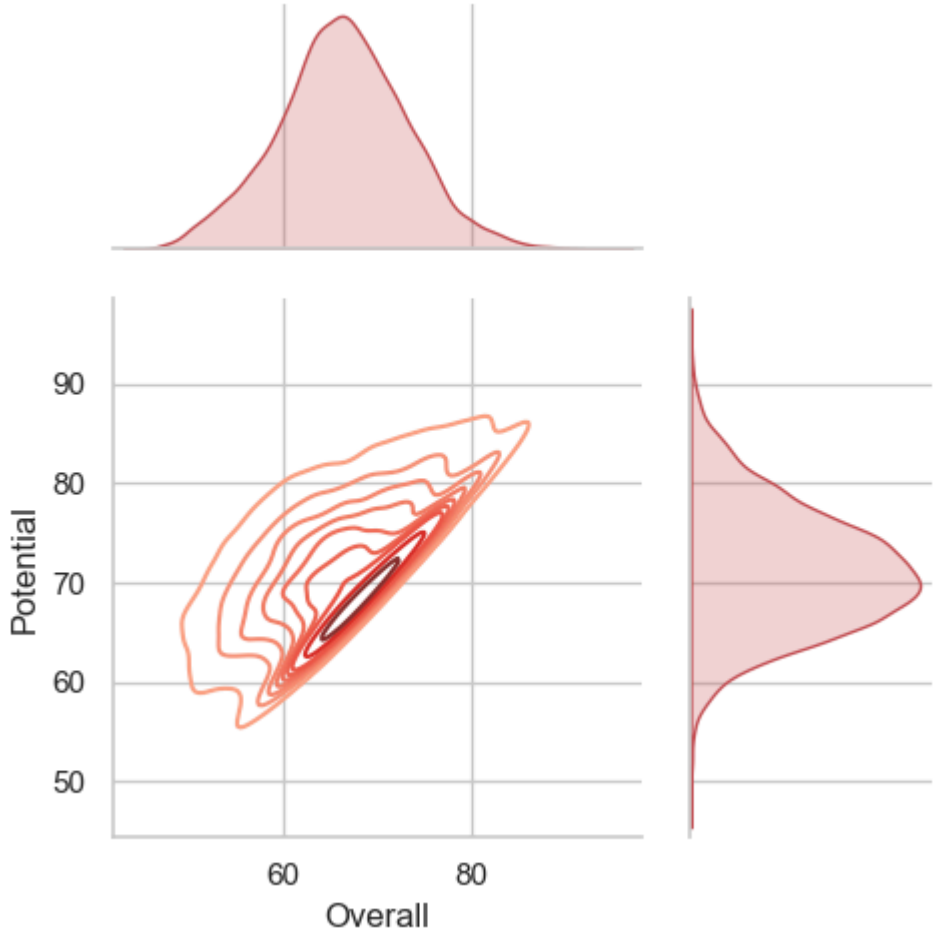
In [208…

```
g=sns.JointGrid(x='Overall',y='Potential',data=fifa19)
g=g.plot_joint(sns.kdeplot,cmap='Blues_d')
g=g.plot_marginals(sns.kdeplot,shade=False)
```



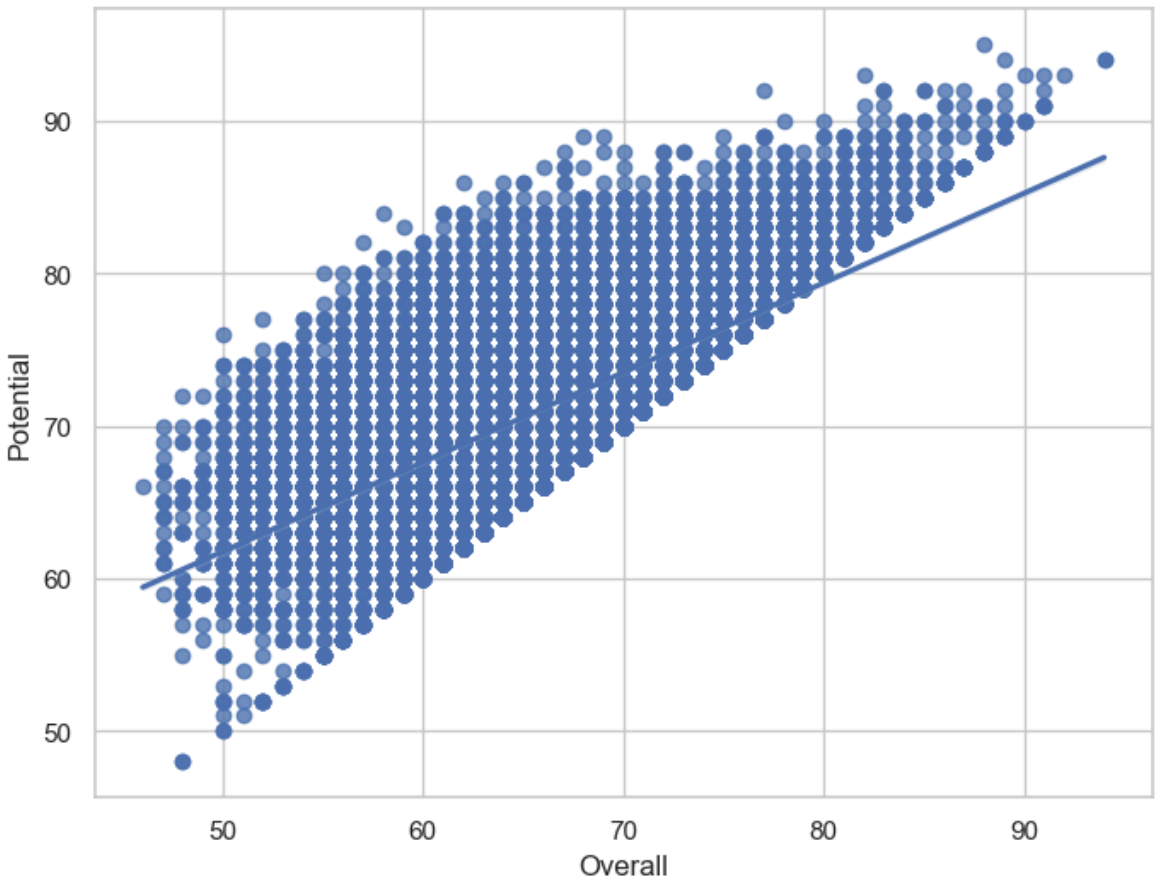
In [211…

```
g=sns.JointGrid(x='Overall',y='Potential',data=fifa19,height=5,ratio=2)
g=g.plot_joint(sns.kdeplot,cmap='Reds_d')
g=g.plot_marginals(sns.kdeplot,color='r',shade=True)
```



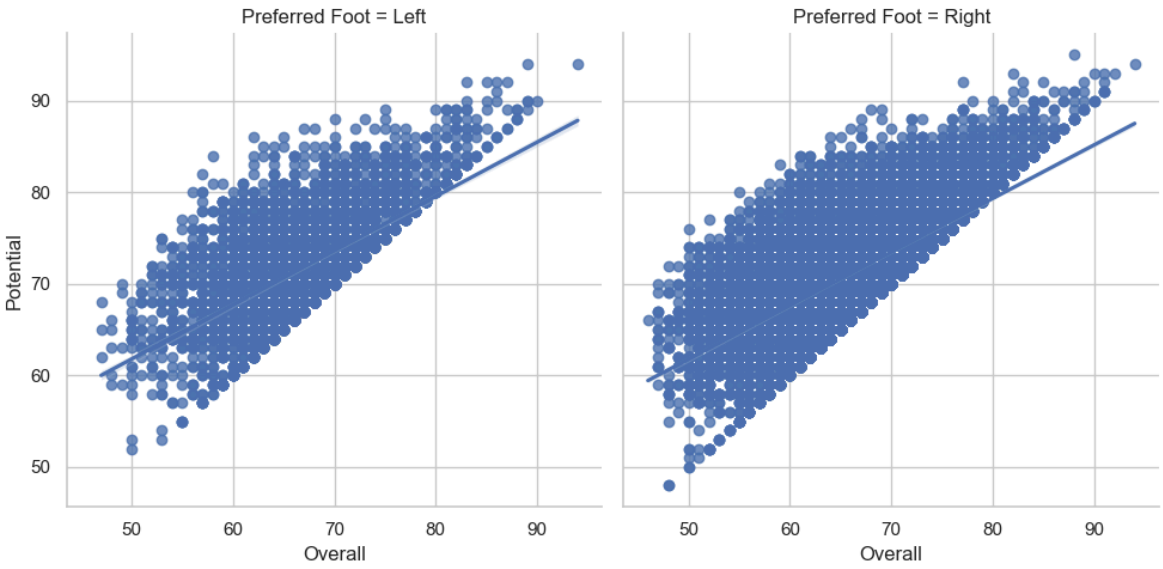
In [213…

```
f,ax=plt.subplots(figsize=(8,6))
ax=sns.regplot(x='Overall', y='Potential',data=fifa19)
```



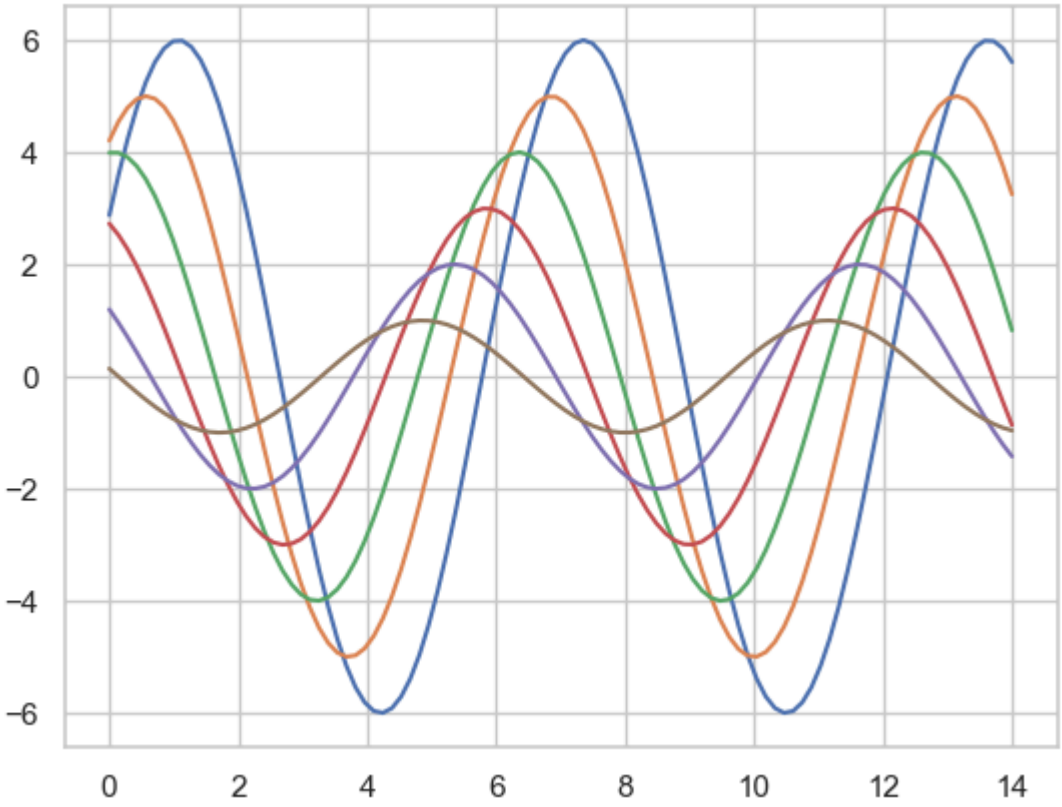
In [215…
```
sns.lmplot(x='Overall', y='Potential',col='Preferred Foot',data=fifa19,col_wrap=
```

Out[215…
```
<seaborn.axisgrid.FacetGrid at 0x16e407e1b50>
```

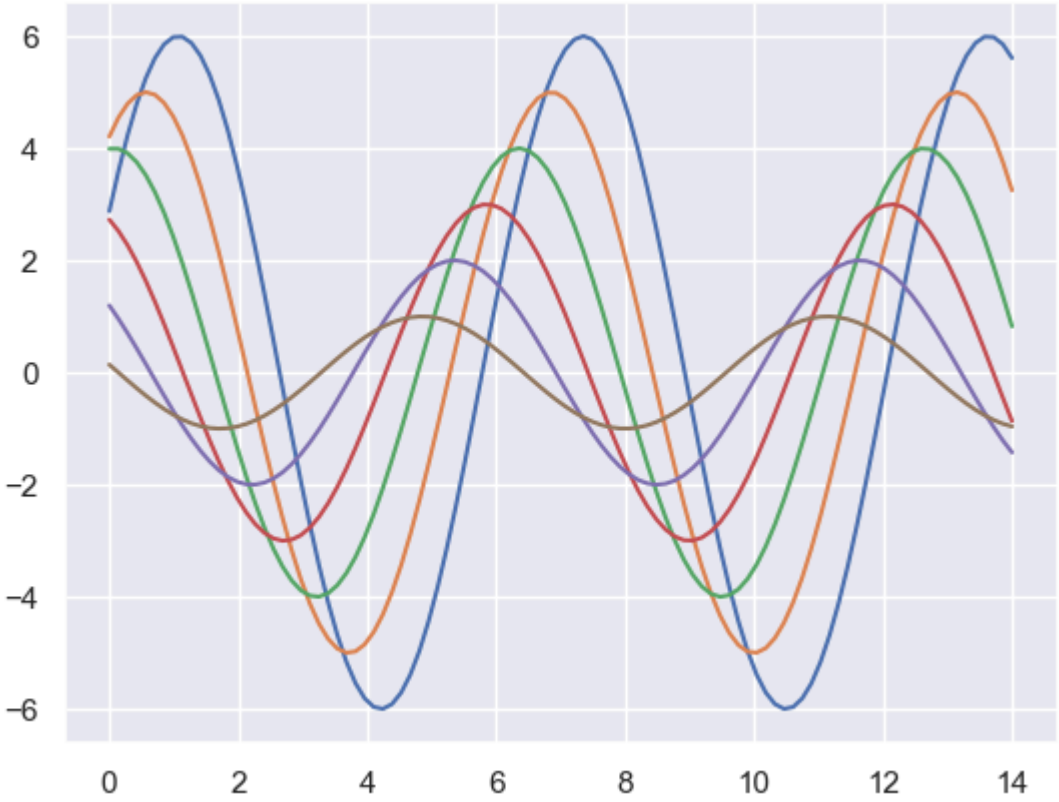


In [217…
```
def sinplot(flip=1):
    x=np.linspace(0,14,100)
    for i in range(1,7):
        plt.plot(x,np.sin(x + i* .5) * (7 - i)* flip)
```

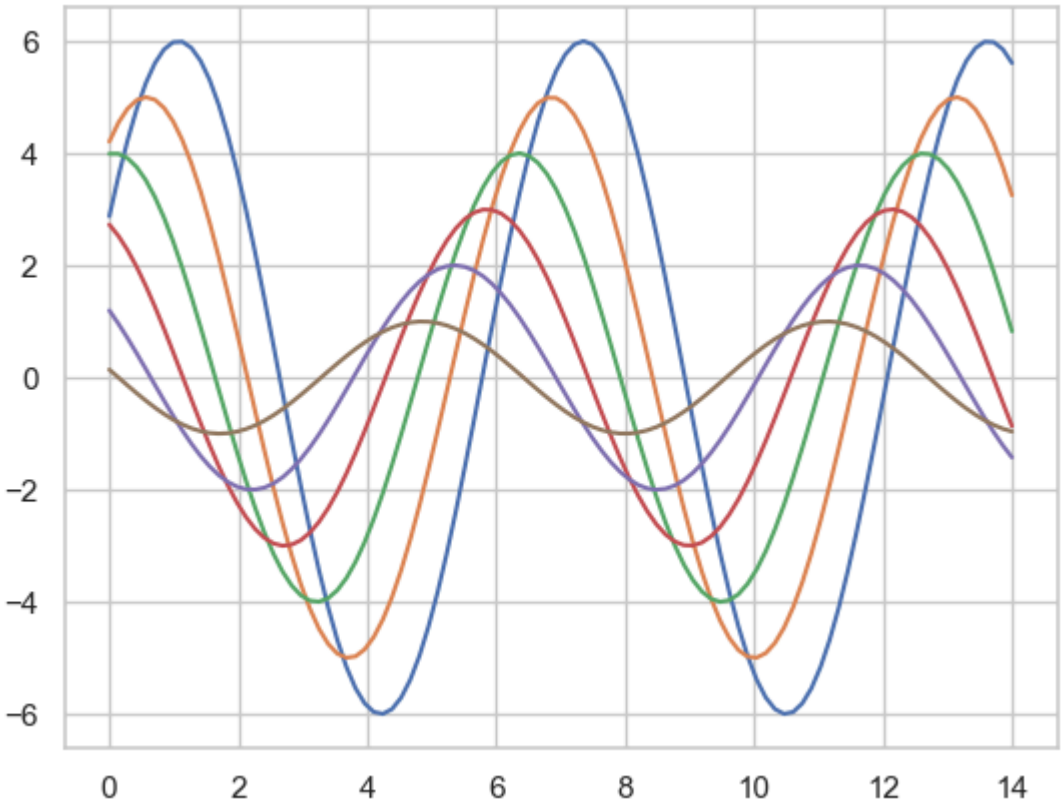
In [219…
```
sinplot()
```



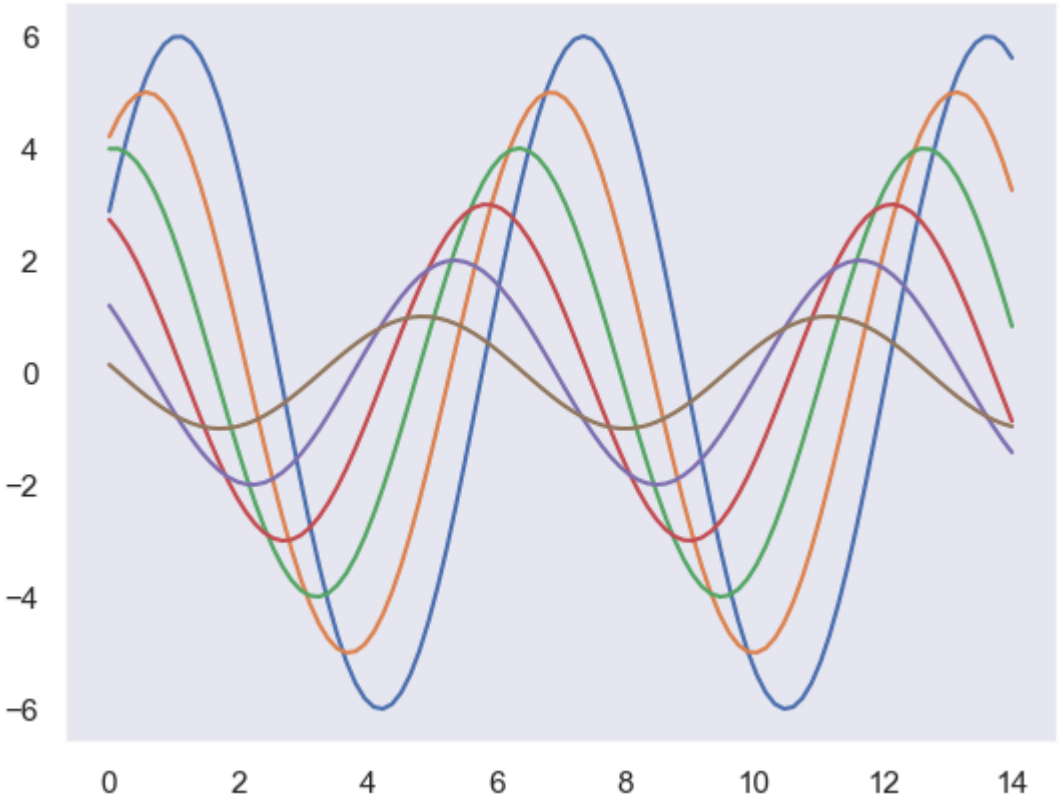
In [221…
```
sns.set()
sinplot()
```



In [223…
```
sns.set_style('whitegrid')
sinplot()
```

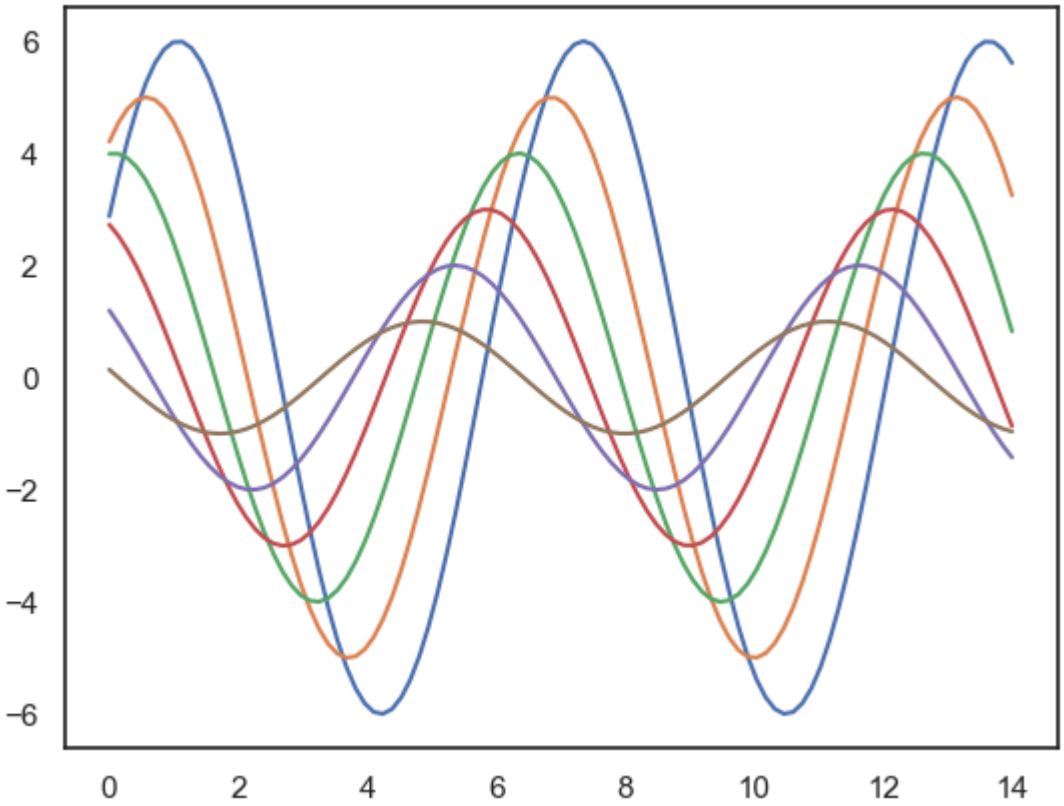


In [225…
```
sns.set_style('dark')
sinplot()
```



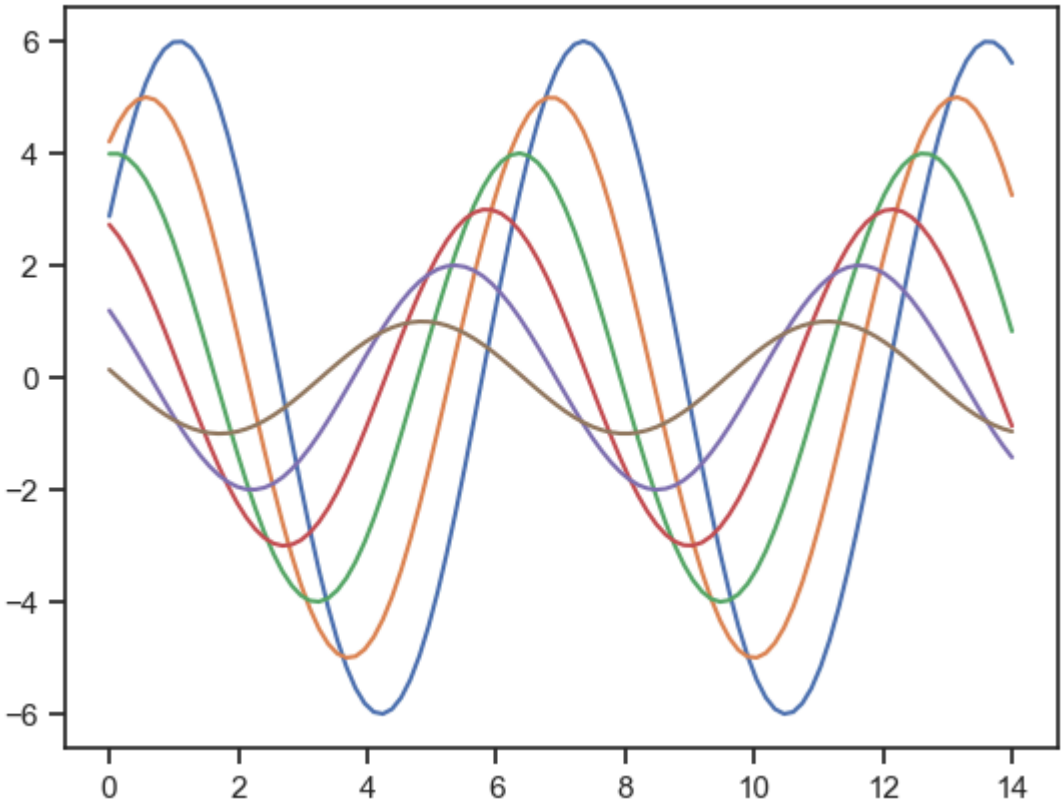
In [227…

```
sns.set_style('white')
sinplot()
```



In [229…

```
sns.set_style('ticks')
sinplot()
```


6
4
2
0
−2
−4
−6
0
2
4
6
8
10
12
14