Visual Analysis of Preferred Foot in European Soccer Leagues

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1 Visual Analysis of Preferred Foot in European Soccer Leagues

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Using the European Soccer Database from Kaggle, I am going to determine if there is any correlation (positive, negative, neutral) between foot preference and other foot skills.

In [1]:
```
# Package imports
%matplotlib inline
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
# Load Player_Attributes as df
cnx = sqlite3.connect('../Week 5/Week-5-Exercises-2/database.sqlite')
df = pd.read_sql_query("SELECT * FROM Player_Attributes", cnx)
```

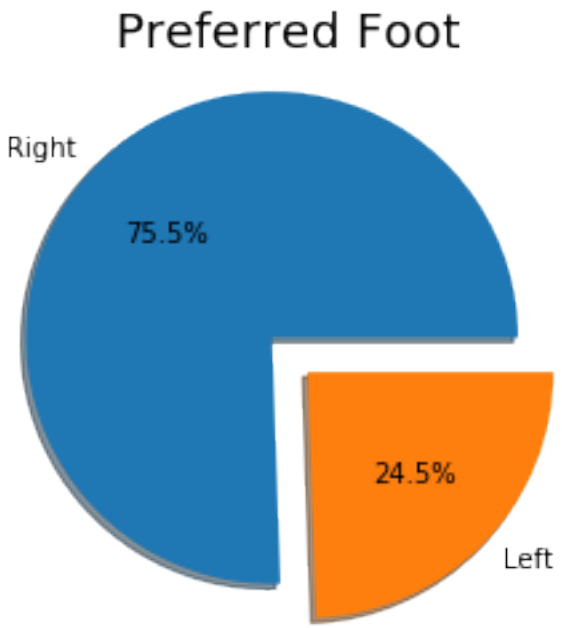
In [3]:
```
# Count NaN, drop NaN values
print('NaN values -before- dropping:')
print(df.isnull().sum().sum())
df.dropna(inplace = True)
print('\nNaN values -after- dropping:')
print(df.isnull().sum().sum())
```

```
NaN values -before- dropping:
47301

NaN values -after- dropping:
0
```

In [4]:
```
# Count how many prefer left/right
preferred_foot = df['preferred_foot'].value_counts()
print('Preferred foot:\n' + preferred_foot.to_string())
```

```
Preferred foot:
right    136247
left      44107
```

In [5]:
```
# Display preferred foot as pie chart
fig1, ax1 = plt.subplots()
ax1.pie(preferred_foot,
        labels = ['Right', 'Left'],
        autopct = '%1.1f%%',
        explode = [0.1, 0.1],
        shadow = True)
ax1.axis('equal')
plt.title('Preferred Foot',
          fontdict = {'fontsize' : 18})
plt.show()
```



In [6]:
```
# Turn preferred foot into integer for analysis
print('Foot preference -before- changing to integer:')
print(df['preferred_foot'].head().to_string())

df.loc[df['preferred_foot'] == 'right', 'preferred_foot'] = 0
df.loc[df['preferred_foot'] == 'left', 'preferred_foot'] = 1

print('\nFoot preference -after- changing to integer:')
print(df['preferred_foot'].head().to_string())
```

```
Foot preference -before- changing to integer:
0    right
1    right
```

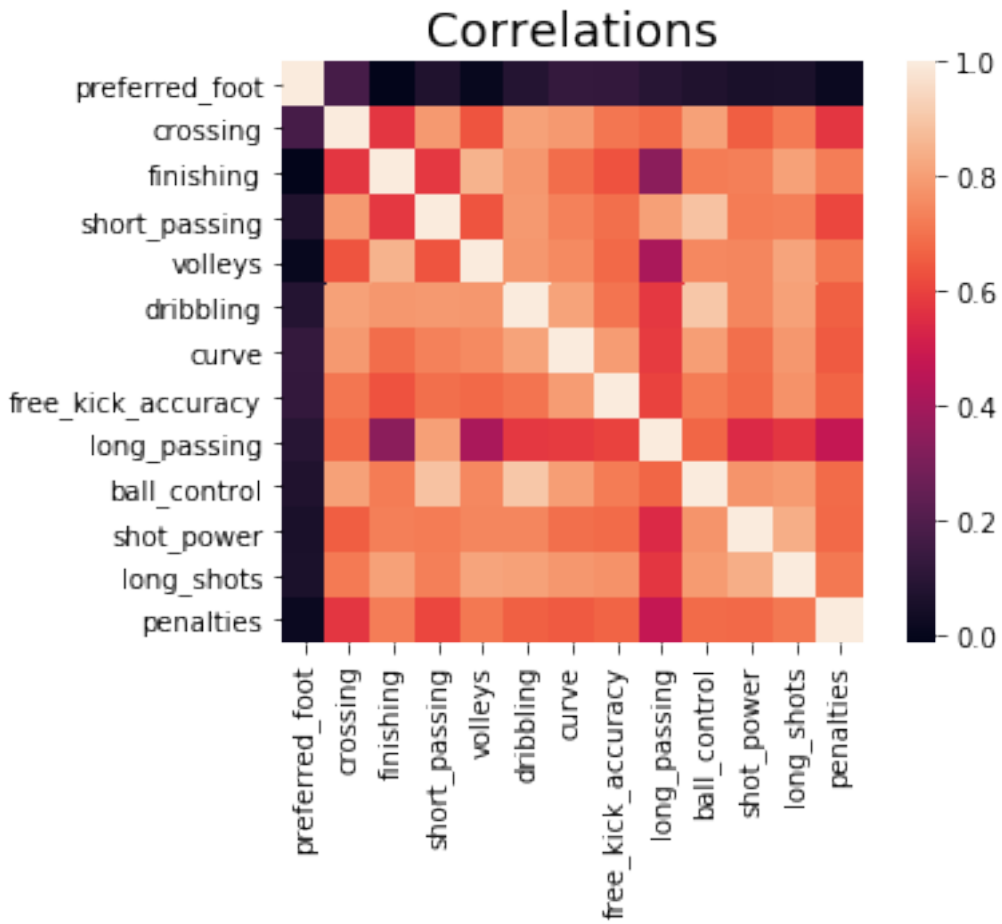
```
2    right
3    right
4    right

Foot preference -after- changing to integer:
0    0
1    0
2    0
3    0
4    0
```

```
In [7]: # Pull out foot-related skills
        foot_skills = df[['preferred_foot',
                          'crossing',
                          'finishing',
                          'short_passing',
                          'volleys',
                          'dribbling',
                          'curve',
                          'free_kick_accuracy',
                          'long_passing',
                          'ball_control',
                          'shot_power',
                          'long_shots',
                          'penalties']]

In [8]: # Compute and show correlations
        correlations = foot_skills.corr()
        print(correlations)
```

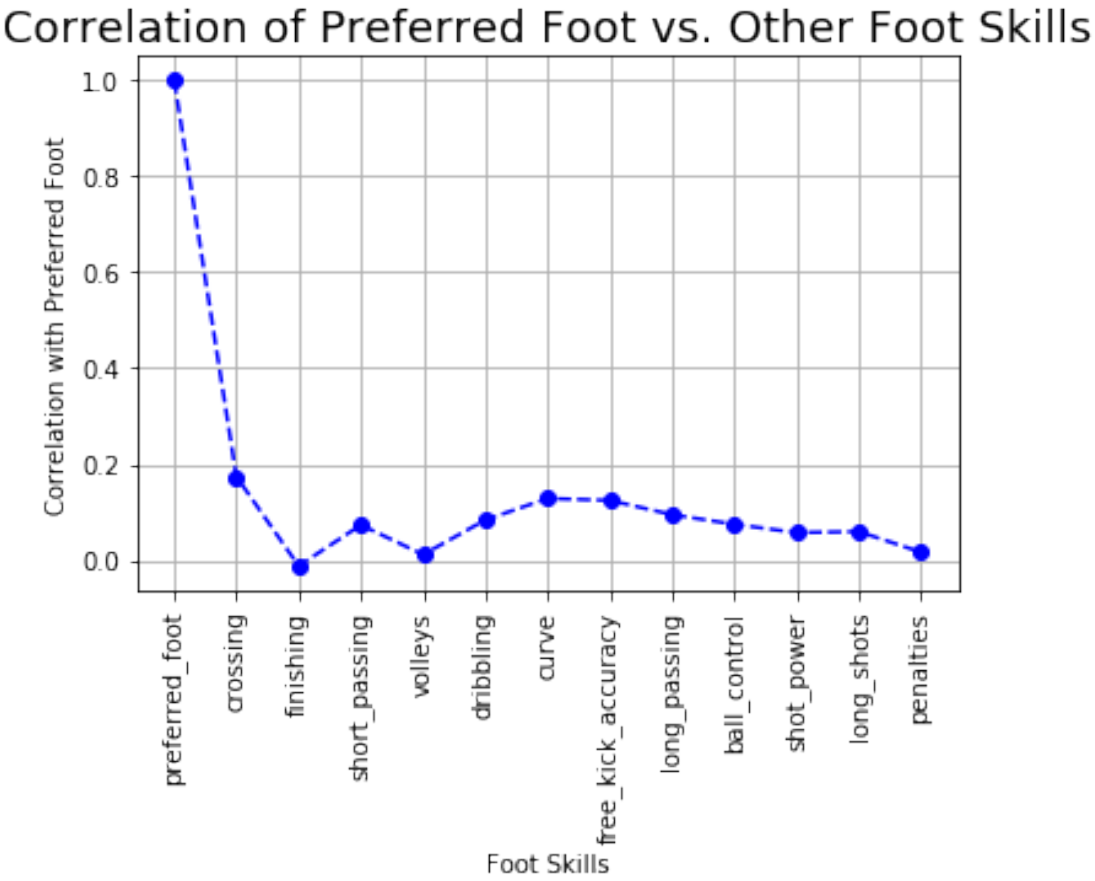
```
                   preferred_foot  crossing  finishing  short_passing  \
preferred_foot           1.000000  0.174033  -0.012004       0.073302
crossing                 0.174033  1.000000   0.576896       0.790323
finishing               -0.012004  0.576896   1.000000       0.580245
short_passing            0.073302  0.790323   0.580245       1.000000
volleys                  0.011572  0.637527   0.851482       0.639995
dribbling                0.083831  0.809747   0.784988       0.788935
curve                    0.128510  0.788924   0.691082       0.731948
free_kick_accuracy       0.124475  0.708763   0.633274       0.693490
long_passing             0.094717  0.685649   0.341121       0.803073
ball_control             0.074678  0.807721   0.720694       0.890622
shot_power               0.057309  0.656740   0.727835       0.722320
long_shots               0.059462  0.716515   0.806895       0.729741
penalties                0.016476  0.574208   0.726234       0.612511

                    volleys  dribbling     curve  free_kick_accuracy  \
preferred_foot     0.011572   0.083831  0.128510            0.124475
```

```
crossing            0.637527   0.809747  0.788924           0.708763
finishing           0.851482   0.784988  0.691082           0.633274
short_passing       0.639995   0.788935  0.731948           0.693490
volleys             1.000000   0.784247  0.752410           0.682909
dribbling           0.784247   1.000000  0.810353           0.707322
curve               0.752410   0.810353  1.000000           0.797842
free_kick_accuracy  0.682909   0.707322  0.797842           1.000000
long_passing        0.414520   0.579201  0.586313           0.603286
ball_control        0.749459   0.901730  0.798598           0.720674
shot_power          0.746622   0.744960  0.694945           0.684191
long_shots          0.814894   0.807175  0.783732           0.773887
penalties           0.713116   0.663420  0.649737           0.669018

                    long_passing  ball_control  shot_power  long_shots  \
preferred_foot          0.094717      0.074678    0.057309    0.059462
crossing                0.685649      0.807721    0.656740    0.716515
finishing               0.341121      0.720694    0.727835    0.806895
short_passing           0.803073      0.890622    0.722320    0.729741
volleys                 0.414520      0.749459    0.746622    0.814894
dribbling               0.579201      0.901730    0.744960    0.807175
curve                   0.586313      0.798598    0.694945    0.783732
free_kick_accuracy      0.603286      0.720674    0.684191    0.773887
long_passing            1.000000      0.675525    0.542244    0.576376
ball_control            0.675525      1.000000    0.774856    0.793219
shot_power              0.542244      0.774856    1.000000    0.838254
long_shots              0.576376      0.793219    0.838254    1.000000
penalties               0.476750      0.684410    0.680887    0.714596

                    penalties
preferred_foot       0.016476
crossing             0.574208
finishing            0.726234
short_passing        0.612511
volleys              0.713116
dribbling            0.663420
curve                0.649737
free_kick_accuracy   0.669018
long_passing         0.476750
ball_control         0.684410
shot_power           0.680887
long_shots           0.714596
penalties            1.000000
```

```
In [9]: # Plot correlations
        ax2 = sns.heatmap(correlations, square = True)
        plt.title('Correlations', fontdict = {'fontsize' : 18})
        plt.show()
```



In [10]:
```
# Plot correlations with preferred foot
fig3, ax3 = plt.subplots()
ax3.plot(correlations['preferred_foot'], 'bo--')
plt.grid(True)
plt.xlabel('Foot Skills')
plt.ylabel('Correlation with Preferred Foot')
plt.xticks(rotation = 90)
plt.title('Correlation of Preferred Foot vs. Other Foot Skills',
          fontdict = {'fontsize' : 18})
plt.show()
```


Correlation of Preferred Foot vs. Other Foot Skills
Correlation with Preferred Foot
1.0
0.8
0.6
0.4
0.2
0.0
preferred_foot
crossing
finishing
short_passing
volleys
dribbling
curve
free_kick_accuracy
long_passing
ball_control
shot_power
long_shots
penalties
Foot Skills