beautifulsoup-1

March 24, 2024

[71]:
```
import requests
from bs4 import BeautifulSoup
import pandas as pd

# Step 1: Send a GET request to the URL
url = 'https://www.basketball-reference.com/leagues/NBA_2020_per_game.html'
response = requests.get(url)

# Check if the request was successful
if response.status_code == 200:
    # Step 2: Parse the HTML content
    soup = BeautifulSoup(response.content, 'html.parser')

    # Find the table containing player statistics
    table = soup.find('table', {'id': 'per_game_stats'})

    # Step 3: Extract data and perform data analytics
    if table:
        # Convert the table HTML to a pandas DataFrame
        df = pd.read_html(str(table))[0]

        # Display the first few rows of the DataFrame
        print("First few rows of the DataFrame:")
        print(df.head())

        # Perform data analytics or further processing as needed
        # For example, calculate summary statistics
        summary_stats = df.describe()
        print("\nSummary statistics:")
        print(summary_stats)

        # Save the DataFrame to a CSV file
        df.to_csv('nba_2020_player_stats.csv', index=False)
        print("\nData saved to 'nba_2020_player_stats.csv'")
    else:
        print("Table not found on the webpage.")
else:
```

```
    print("Failed to retrieve the webpage. Status code:", response.status_code)
```

```
First few rows of the DataFrame:
  Rk                     Player Pos Age   Tm   G  GS    MP   FG   FGA  … \
0  1                Steven Adams   C  26  OKC  63  63  26.7  4.5   7.6  …
1  2                 Bam Adebayo  PF  22  MIA  72  72  33.6  6.1  11.0  …
2  3           LaMarcus Aldridge   C  34  SAS  53  53  33.1  7.4  15.0  …
3  4              Kyle Alexander   C  23  MIA   2   0   6.5  0.5   1.0  …
4  5  Nickeil Alexander-Walker  SG  21  NOP  47   1  12.6  2.1   5.7  …

    FT%  ORB  DRB   TRB  AST  STL  BLK  TOV   PF   PTS
0  .582  3.3  6.0   9.3  2.3  0.8  1.1  1.5  1.9  10.9
1  .691  2.4  7.8  10.2  5.1  1.1  1.3  2.8  2.5  15.9
2  .827  1.9  5.5   7.4  2.4  0.7  1.6  1.4  2.4  18.9
3   NaN  1.0  0.5   1.5  0.0  0.0  0.0  0.5  0.5   1.0
4  .676  0.2  1.6   1.8  1.9  0.4  0.2  1.1  1.2   5.7

[5 rows x 30 columns]

Summary statistics:
          Rk  Player  Pos  Age   Tm    G   GS   MP   FG  FGA  …    FT%  ORB  \
count    677     677  677  677  677  677  677  677  677  677  …    644  677
unique   530     530   15   23   32   75   73  277   96  176  …    272   41
top       Rk  Player   SG   24  TOT    G    0   MP  1.3  FGA  …  1.000  0.3
freq      26      26  141   79   60   26  191   26   28   26  …     34   74

         DRB  TRB  AST  STL  BLK  TOV   PF  PTS
count    677  677  677  677  677  677  677  677
unique    87  104   73   23   26   44   42  208
top      DRB  TRB  0.8  0.4  0.1  0.8  1.9  PTS
freq      26   26   34   77  109   49   39   26

[4 rows x 30 columns]

Data saved to 'nba_2020_player_stats.csv'
```

[72]:
```
## loading the dataset
df=pd.read_csv('C:/Users/KSK/Downloads/nba_2020_player_stats.csv')
```

[73]:
```
df.head()
```

[73]:
```
  Rk                     Player Pos Age   Tm   G  GS    MP   FG   FGA  … \
0  1                Steven Adams   C  26  OKC  63  63  26.7  4.5   7.6  …
1  2                 Bam Adebayo  PF  22  MIA  72  72  33.6  6.1  11.0  …
2  3           LaMarcus Aldridge   C  34  SAS  53  53  33.1  7.4  15.0  …
3  4              Kyle Alexander   C  23  MIA   2   0   6.5  0.5   1.0  …
4  5  Nickeil Alexander-Walker  SG  21  NOP  47   1  12.6  2.1   5.7  …
```

```
    FT%  ORB  DRB   TRB  AST  STL  BLK  TOV   PF   PTS
0  .582  3.3  6.0   9.3  2.3  0.8  1.1  1.5  1.9  10.9
1  .691  2.4  7.8  10.2  5.1  1.1  1.3  2.8  2.5  15.9
2  .827  1.9  5.5   7.4  2.4  0.7  1.6  1.4  2.4  18.9
3   NaN  1.0  0.5   1.5  0.0  0.0  0.0  0.5  0.5   1.0
4  .676  0.2  1.6   1.8  1.9  0.4  0.2  1.1  1.2   5.7

[5 rows x 30 columns]
```

[74]:
```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Step 1: Load the dataset
#df = pd.read_csv('nba_2020_player_stats.csv')

# Step 2: Inspect the structure and summary statistics
print("Dataset information:")
print(df.info())
print("\nSummary statistics:")
print(df.describe())
```

```
Dataset information:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 677 entries, 0 to 676
Data columns (total 30 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Rk      677 non-null    object
 1   Player  677 non-null    object
 2   Pos     677 non-null    object
 3   Age     677 non-null    object
 4   Tm      677 non-null    object
 5   G       677 non-null    object
 6   GS      677 non-null    object
 7   MP      677 non-null    object
 8   FG      677 non-null    object
 9   FGA     677 non-null    object
 10  FG%     675 non-null    object
 11  3P      677 non-null    object
 12  3PA     677 non-null    object
 13  3P%     642 non-null    object
 14  2P      677 non-null    object
 15  2PA     677 non-null    object
 16  2P%     671 non-null    object
 17  eFG%    675 non-null    object
```

```
 18  FT      677 non-null    object
 19  FTA     677 non-null    object
 20  FT%     644 non-null    object
 21  ORB     677 non-null    object
 22  DRB     677 non-null    object
 23  TRB     677 non-null    object
 24  AST     677 non-null    object
 25  STL     677 non-null    object
 26  BLK     677 non-null    object
 27  TOV     677 non-null    object
 28  PF      677 non-null    object
 29  PTS     677 non-null    object
dtypes: object(30)
memory usage: 158.8+ KB
None

Summary statistics:
          Rk  Player  Pos  Age   Tm    G   GS   MP   FG  FGA  …    FT%  ORB  \
count    677     677  677  677  677  677  677  677  677  677  …    644  677
unique   530     530   15   23   32   75   73  277   96  176  …    272   41
top       Rk  Player   SG   24  TOT    G    0   MP  1.3  FGA  …  1.000  0.3
freq      26      26  141   79   60   26  191   26   28   26  …     34   74

         DRB  TRB  AST  STL  BLK  TOV   PF  PTS
count    677  677  677  677  677  677  677  677
unique    87  104   73   23   26   44   42  208
top      DRB  TRB  0.8  0.4  0.1  0.8  1.9  PTS
freq      26   26   34   77  109   49   39   26

[4 rows x 30 columns]
```

[75]:
```
# Step 3: Handle missing or inconsistent data
# Check for missing values
print("\nMissing values:")
print(df.isnull().sum())
```

```
Missing values:
Rk        0
Player    0
Pos       0
Age       0
Tm        0
G         0
GS        0
MP        0
FG        0
FGA       0
```

```
FG%        2
3P         0
3PA        0
3P%       35
2P         0
2PA        0
2P%        6
eFG%       2
FT         0
FTA        0
FT%       33
ORB        0
DRB        0
TRB        0
AST        0
STL        0
BLK        0
TOV        0
PF         0
PTS        0
dtype: int64
```

[76]:
```
df.dtypes
```

[76]:
```
Rk        object
Player    object
Pos       object
Age       object
Tm        object
G         object
GS        object
MP        object
FG        object
FGA       object
FG%       object
3P        object
3PA       object
3P%       object
2P        object
2PA       object
2P%       object
eFG%      object
FT        object
FTA       object
FT%       object
ORB       object
DRB       object
```

```
TRB       object
AST       object
STL       object
BLK       object
TOV       object
PF        object
PTS       object
dtype: object
```

[77]:
```
# Step 1: Convert non-numeric values to NaN
df_numeric = df.apply(pd.to_numeric, errors='coerce')
```

[78]:
```
df_numeric.head()
```

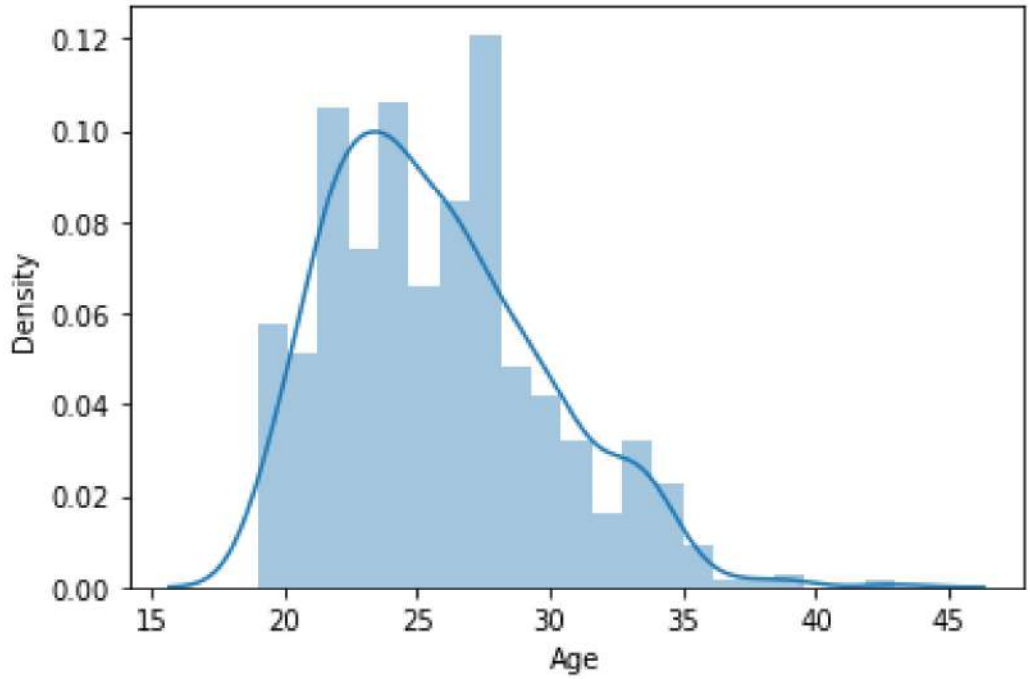
[78]:

	Rk	Player	Pos	Age	Tm	G	GS	MP	FG	FGA	…	FT%	ORB	\
0	1.0	NaN	NaN	26.0	NaN	63.0	63.0	26.7	4.5	7.6	…	0.582	3.3	
1	2.0	NaN	NaN	22.0	NaN	72.0	72.0	33.6	6.1	11.0	…	0.691	2.4	
2	3.0	NaN	NaN	34.0	NaN	53.0	53.0	33.1	7.4	15.0	…	0.827	1.9	
3	4.0	NaN	NaN	23.0	NaN	2.0	0.0	6.5	0.5	1.0	…	NaN	1.0	
4	5.0	NaN	NaN	21.0	NaN	47.0	1.0	12.6	2.1	5.7	…	0.676	0.2	

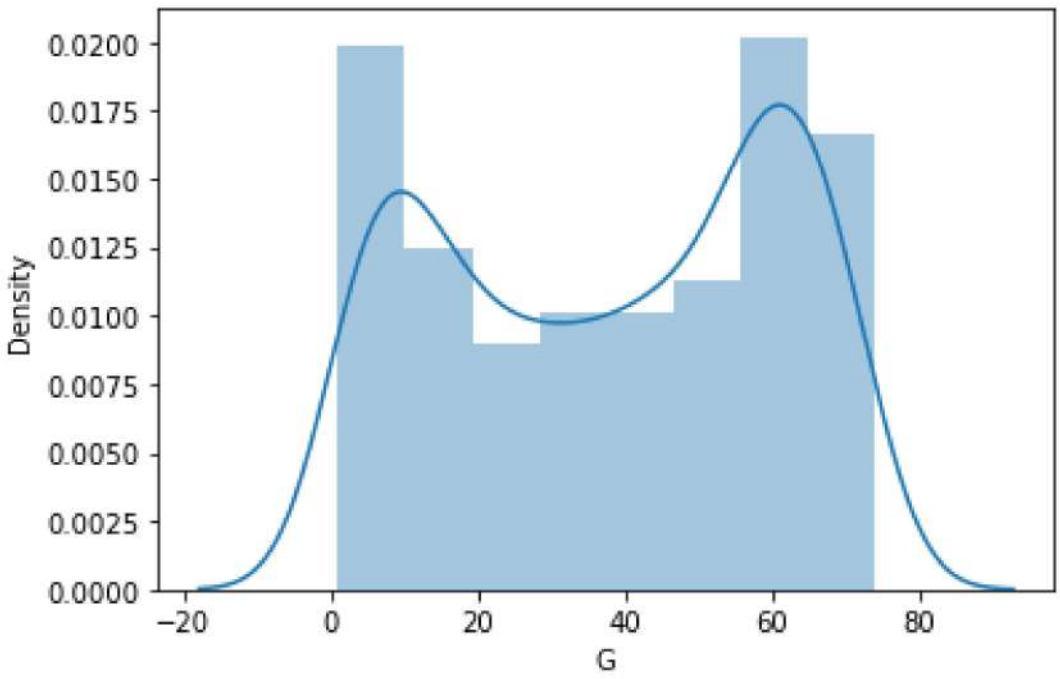
	DRB	TRB	AST	STL	BLK	TOV	PF	PTS
0	6.0	9.3	2.3	0.8	1.1	1.5	1.9	10.9
1	7.8	10.2	5.1	1.1	1.3	2.8	2.5	15.9
2	5.5	7.4	2.4	0.7	1.6	1.4	2.4	18.9
3	0.5	1.5	0.0	0.0	0.0	0.5	0.5	1.0
4	1.6	1.8	1.9	0.4	0.2	1.1	1.2	5.7

[5 rows x 30 columns]

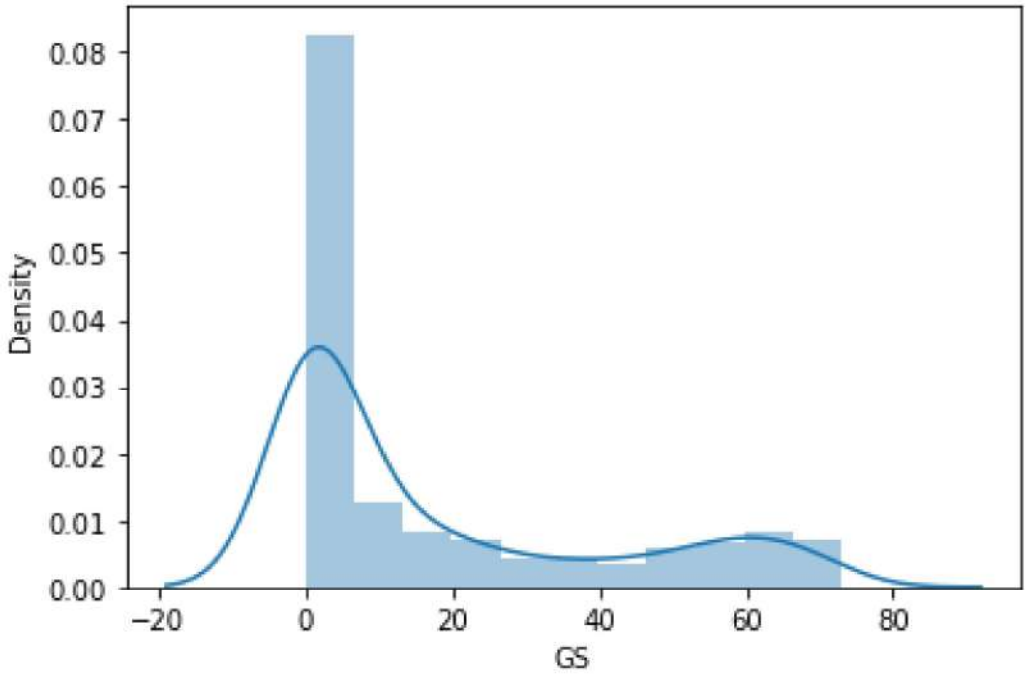
[80]:
```
import warnings
warnings.filterwarnings('ignore')
sns.distplot(df_numeric['Age'])
plt.show()
```



[81]:
```
import warnings
warnings.filterwarnings('ignore')
sns.distplot(df_numeric['G'])
plt.show()
```



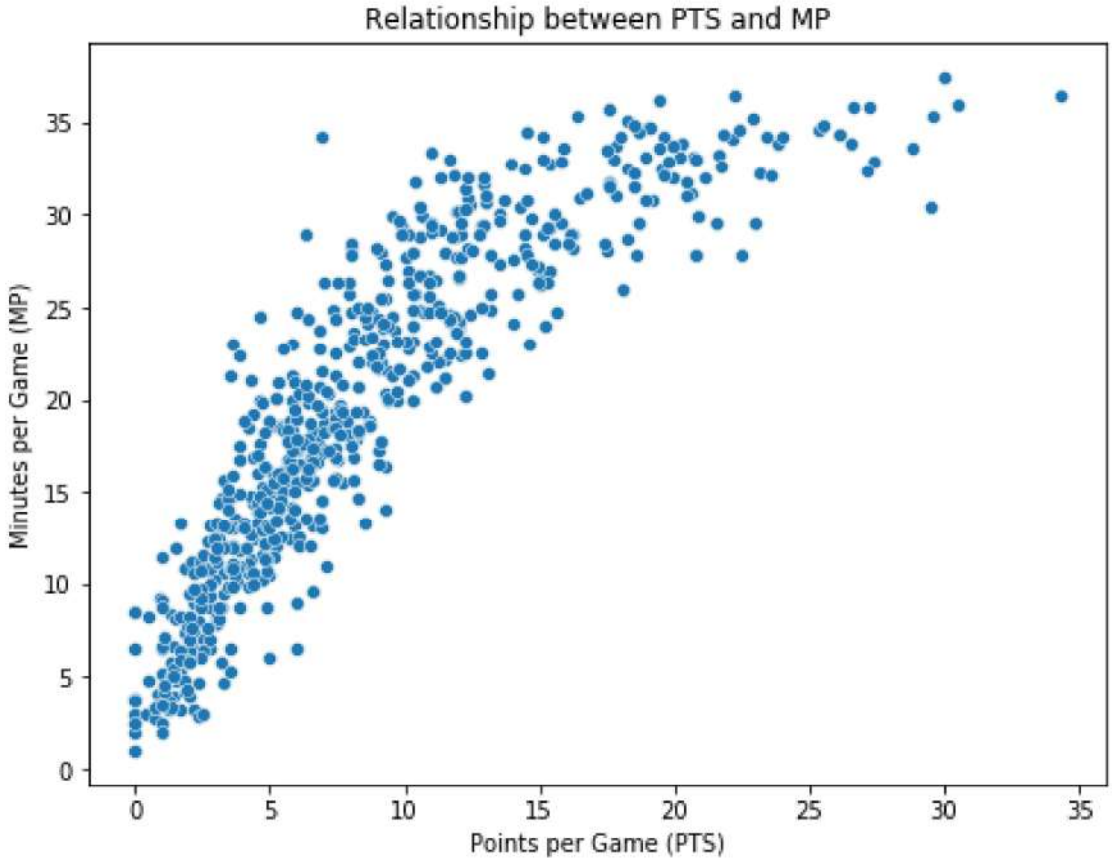
[82]:
```
import warnings
warnings.filterwarnings('ignore')
sns.distplot(df_numeric['GS'])
plt.show()
```



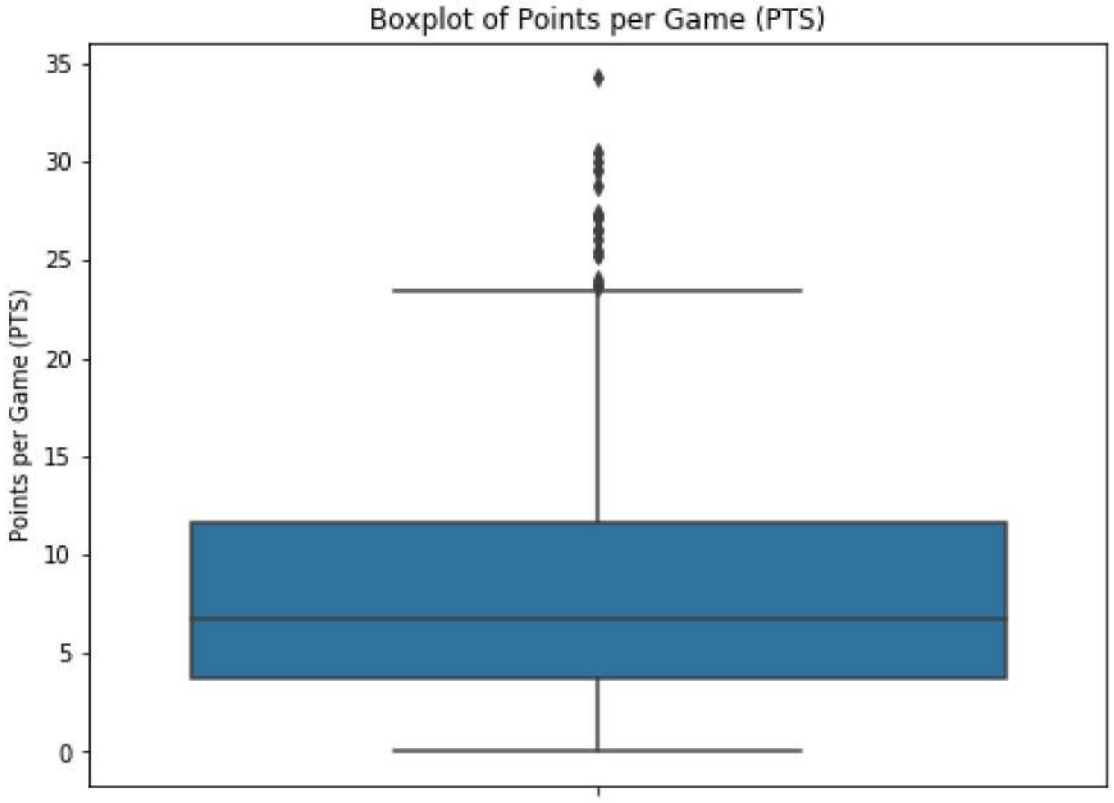
[83]:
```
# Step 5: Analyze categorical variables
# Unique values in categorical variables
print("\nUnique values in categorical variables:")
for column in df_numeric.select_dtypes(include='object'):
    print(f"{column}: {df_numeric[column].unique()}")
```

```
Unique values in categorical variables:
```

[84]:
```
# Step 6: Visualize relationships between variables
# Example: Scatter plot between points per game (PTS) and minutes per game (MP)
plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_numeric, x='PTS', y='MP')
plt.title('Relationship between PTS and MP')
plt.xlabel('Points per Game (PTS)')
plt.ylabel('Minutes per Game (MP)')
plt.show()
```



[85]:
```
# Step 7: Identify outliers or anomalies
# Example: Boxplot for points per game (PTS)
plt.figure(figsize=(8, 6))
sns.boxplot(data=df_numeric, y='PTS')
plt.title('Boxplot of Points per Game (PTS)')
plt.ylabel('Points per Game (PTS)')
plt.show()
```



[86]:
```
# Step 8: Derive additional features if necessary
# Example: Calculate field goal percentage (FG%)
df_numeric['FG%'] = df_numeric['FG'] / df_numeric['FGA']
```

[87]:
```
# Step 9: Draw conclusions and insights from the analysis
# Example: Analyze correlation between numerical variables
correlation_matrix = df_numeric.corr()
plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', fmt=".2f")
plt.title('Correlation Matrix')
plt.show()
```