02_minutes_vs_scoring

December 18, 2025

1 Q2: Relationship Between Minutes Played and Scoring Output

This notebook investigates how minutes played influence scoring performance.

We aim to understand:

- Does scoring increase linearly with minutes?
- Is there a point of diminishing returns?
- Are some players unusually efficient per minute?

[2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

df = pd.read_csv("data/player_game_stats_clean.csv")
df.head()
```

[2]:

	Player	Tm	Opp	Res	MP	FG	FGA	FG%	3P	3PA	…	TOV	PF	\
0	Jayson Tatum	BOS	NYK	W	30.30	14	18	0.778	8	11	…	1	1	
1	Anthony Davis	LAL	MIN	W	37.58	11	23	0.478	1	3	…	1	1	
2	Derrick White	BOS	NYK	W	26.63	8	13	0.615	6	10	…	0	1	
3	Jrue Holiday	BOS	NYK	W	30.52	7	9	0.778	4	6	…	0	2	
4	Miles McBride	NYK	BOS	L	25.85	8	10	0.800	4	5	…	1	1	

	PTS	GmSc	Data	Win	GameKey	PTS_per_min	\
0	37	38.1	2024-10-22	1	2024-10-22_BOS_vs_NYK	1.221122	
1	36	34.0	2024-10-22	1	2024-10-22_LAL_vs_MIN	0.957956	
2	24	22.4	2024-10-22	1	2024-10-22_BOS_vs_NYK	0.901239	
3	18	19.5	2024-10-22	1	2024-10-22_BOS_vs_NYK	0.589777	
4	22	17.8	2024-10-22	0	2024-10-22_NYK_vs_BOS	0.851064	

	TRB_per_min	AST_per_min
0	0.132013	0.330033
1	0.425758	0.106440
2	0.112655	0.150207
3	0.131062	0.131062
4	0.000000	0.077369

```
[5 rows x 30 columns]
```

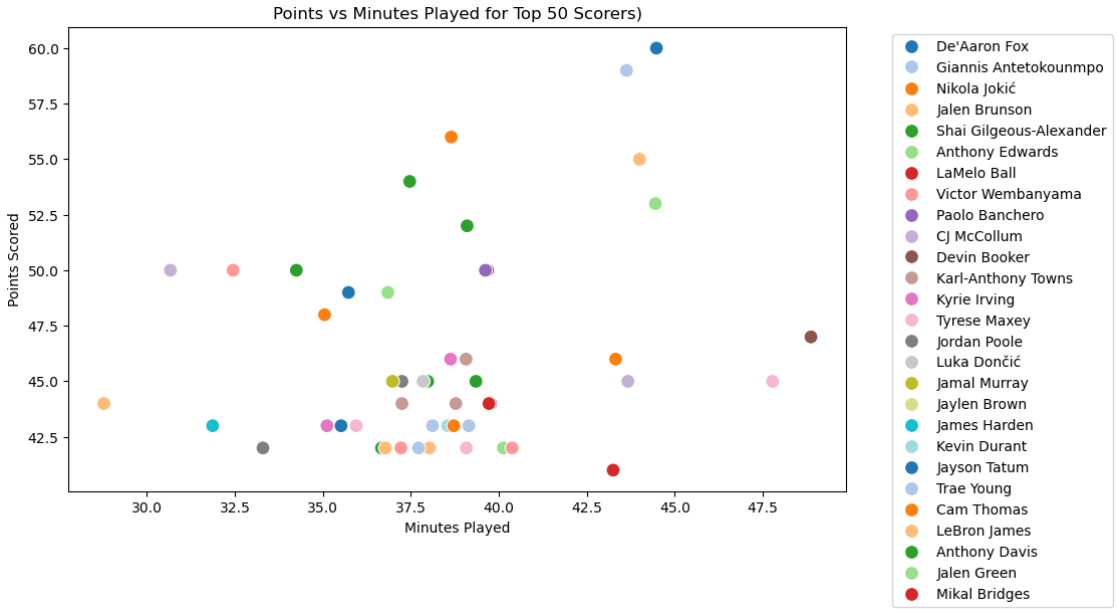
Converted Minutes Played column (MP) to float, calculated the points per minute for each player and organized the list with the top 10 players with the most PPM.

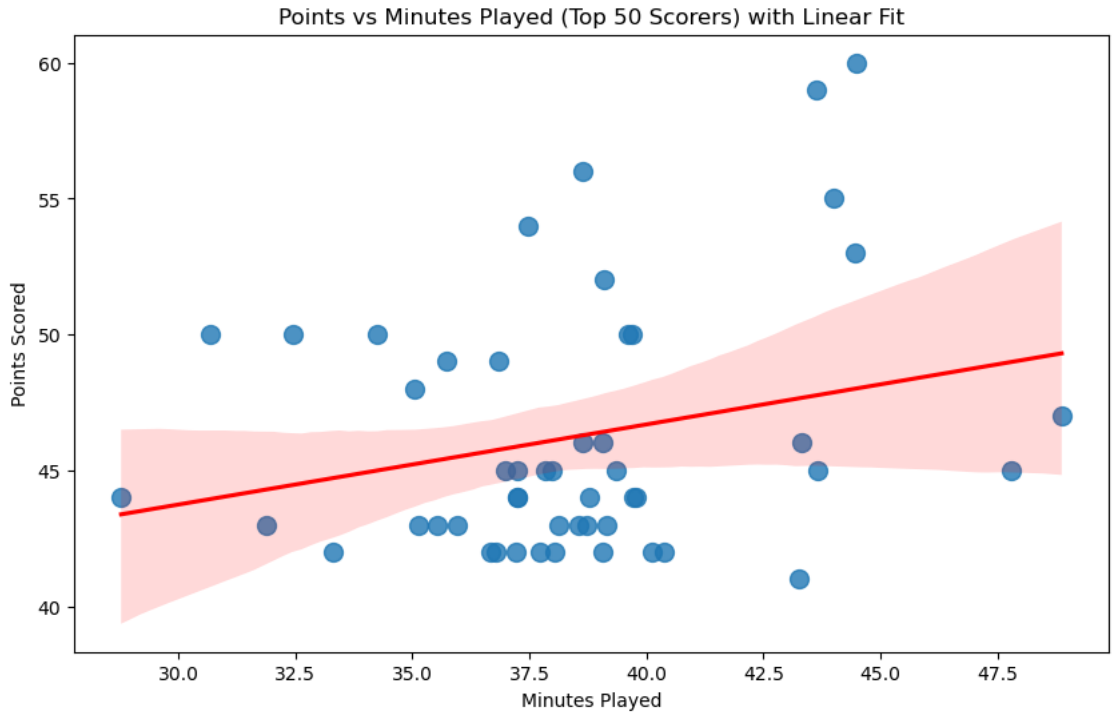
[3]:
```
# Change data type to float
df['MP'] = df['MP'].astype(float)
df['MP']

# Calculate Points Per Minute
df['PPM'] = df['PTS'] / df['MP']
df['PPM']

ppm_list = df[['Player', 'PPM']]

ppm_list_sorted = ppm_list.sort_values(by='PPM', ascending=False)
print(ppm_list_sorted.head(10))

# Printed the top 50 players with highest PPM
top50 = df.sort_values(by='PTS', ascending=False).head(50)
```

```
                  Player       PPM
5132      Chris Livingston  4.000000
7671               JT Thor  3.030303
11561     Brandon Williams  2.797203
10584        Maxwell Lewis  2.777778
10905  Patrick Baldwin Jr.  2.678571
4063          Chris Duarte  2.597403
6347        Jazian Gortman  2.564103
11670        Chris Boucher  2.518892
12259            Matt Ryan  2.515723
4055             KJ Martin  2.459016
```

[6]:
```
# Plot Showing Points Scored vs. Minutes Played
plt.figure(figsize=(10,6))
sns.scatterplot(data=top50, x='MP', y='PTS', hue='Player', palette='tab20',␣
 ↪s=100)
plt.title('Points vs Minutes Played for Top 50 Scorers)')
plt.xlabel('Minutes Played')
plt.ylabel('Points Scored')
plt.legend(bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()

# Printed plot with the top 50 scorers against a linear model
plt.figure(figsize=(10,6))
sns.regplot(data=top50, x='MP', y='PTS', scatter_kws={'s':100},␣
 ↪line_kws={'color':'red'})
```

```
plt.title('Points vs Minutes Played (Top 50 Scorers) with Linear Fit')
plt.xlabel('Minutes Played')
plt.ylabel('Points Scored')
plt.show()
```





Calculate the Correlation Coefficient to see if there is a relationship between MP and PTS.

[5]:
```
# Calculated correlation between minutes played and points scored
corr = df['MP'].corr(df['PTS'])
print(f'Pearson correlation between Minutes and Points: {corr:.2f}')
```

```
Pearson correlation between Minutes and Points: 0.74
```

The correlation between minutes played and points scored is minimal at only 0.74. Therefore, there is not necessarile a high impact between the two.

[ ]:
```

```