

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

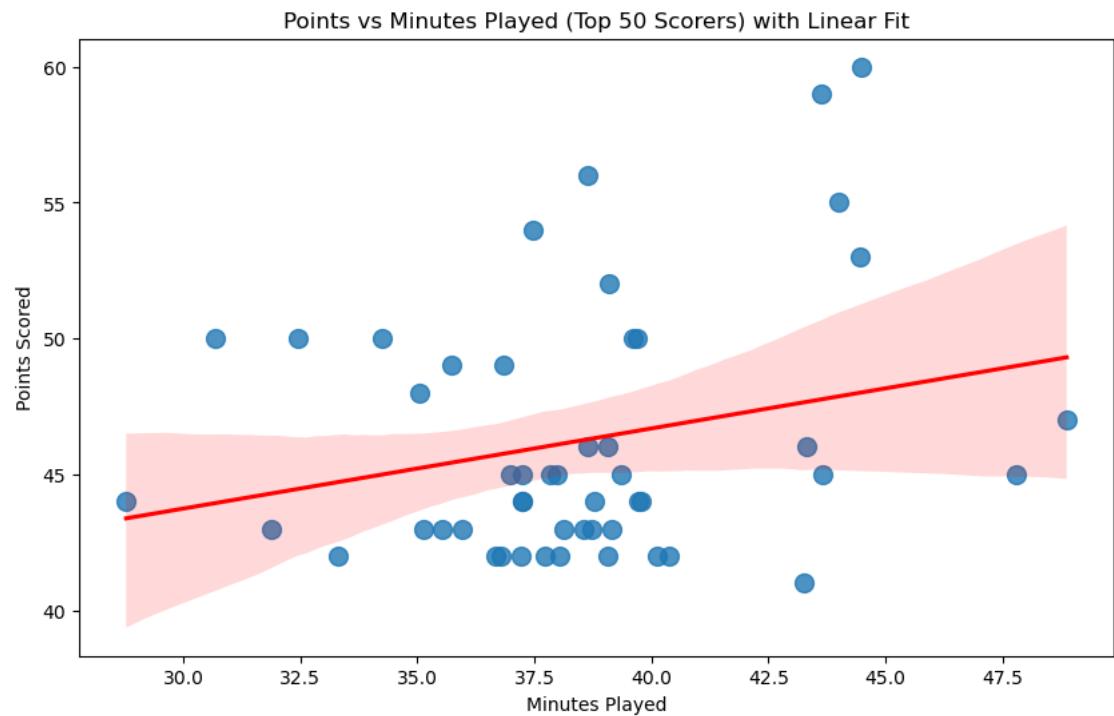
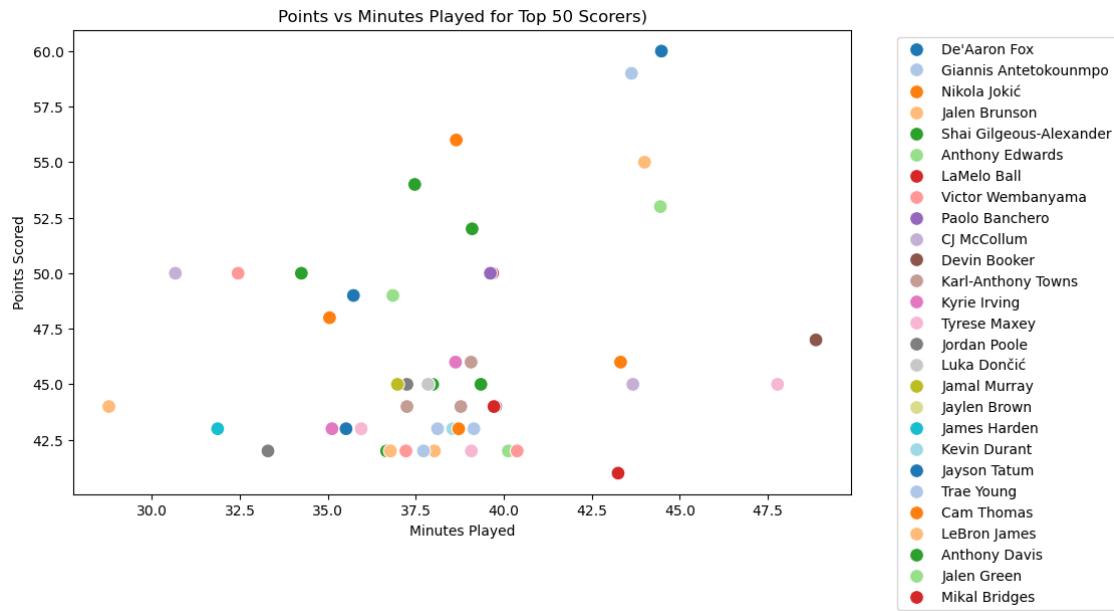
```
[6]: # Plot Showing Points Scored vs. Minutes Played
plt.figure(figsize=(10,6))
sns.scatterplot(data=top50, x='MP', y='PTS', hue='Player', palette='tab20', s=100)
plt.title('Points vs Minutes Played for Top 50 Scorers')
plt.xlabel('Minutes Played')
plt.ylabel('Points Scored')
plt.legend(bbox_to_anchor=(1.05, 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 necessarily a high impact between the two.

```
[ ]:
```