

GDP and Population: Which is a Greater Predictor of Olympic Success

Calixto Calangi
Thoai Phan
Ivan Guo
Brian Ponce

Research Question

- Between a country's population and how much of their GDP is allocated to sports, is there a relationship to how well their respective athletes do in medal placements (gold, silver, bronze) at the Olympics?
- Essentially, as a result of either a country's population or GDP/expenditure towards sports, do either have a significant factor in predicting/relating to athletes' medal placements at the Olympics?

Hypothesis

- Our hypothesis is that more allocation of government spending/expenditure towards sports should lead to better performance and medal placements at the Olympics.
- On the other hand, population is not a significant contributor, as resources (training) and produced goods (equipment) that are needed to be successful is more important for athletes' performance.

Datasets

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- 1) Athlete events in Olympic history → year, event, medal, season, country
- 2) GDP across the world → various countries' GDP from 1960 to 2022
- 3) Population, 10000 BCE to 2021 → country, year, population

Task:

- Categorizing countries into groups based on GDP and population

	Country	Year	Population
197	Afghanistan	1960	8622473
198	Afghanistan	1961	8790140
199	Afghanistan	1962	8969055
200	Afghanistan	1963	9157463
201	Afghanistan	1964	9355510
...
58247	Zimbabwe	2017	14751101
58248	Zimbabwe	2018	15052191
58249	Zimbabwe	2019	15354606
58250	Zimbabwe	2020	15669663
58251	Zimbabwe	2021	15993525

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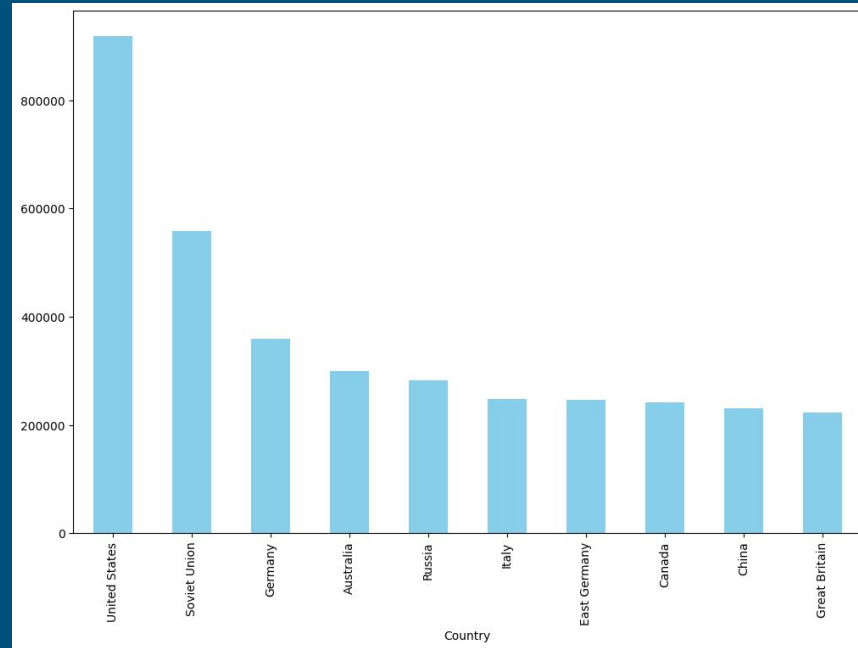
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	Country	Year	Value
0	Afghanistan	1960	5.377778e+08
1	Afghanistan	1961	5.488889e+08
2	Afghanistan	1962	5.466667e+08
3	Afghanistan	1963	7.511112e+08
4	Afghanistan	1964	8.000000e+08
...
11502	Zimbabwe	2012	1.424249e+10
11503	Zimbabwe	2013	1.545177e+10
11504	Zimbabwe	2014	1.589105e+10
11505	Zimbabwe	2015	1.630467e+10
11506	Zimbabwe	2016	1.661996e+10

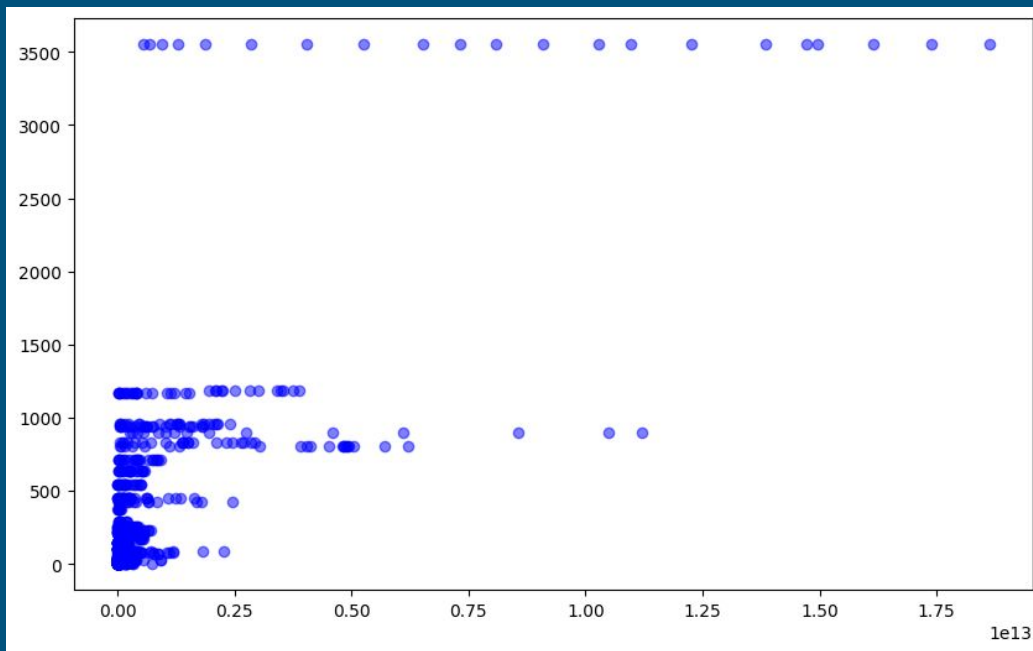
	Country	Year	Medal	GDP	Population	GDP_Category	Population_Category
0	Afghanistan	2008	1	1.019053e+10	26427204.0	Low	Medium
1	Afghanistan	2012	1	2.053654e+10	30466484.0	Low	Medium
2	Algeria	1984	2	5.369828e+10	21393532.0	Medium	Medium
3	Algeria	1992	2	4.800330e+10	26748302.0	Medium	Medium
4	Algeria	1996	3	4.694150e+10	28984640.0	Medium	Medium
...
1317	Zambia	1984	1	2.739444e+09	6488077.0	Low	Low
1318	Zambia	1996	1	3.597221e+09	8902025.0	Low	Medium
1319	Zimbabwe	1980	15	6.678868e+09	7049931.0	Low	Low
1320	Zimbabwe	2004	3	5.805598e+09	12160885.0	Low	Medium
1321	Zimbabwe	2008	4	4.415703e+09	12550353.0	Low	Medium

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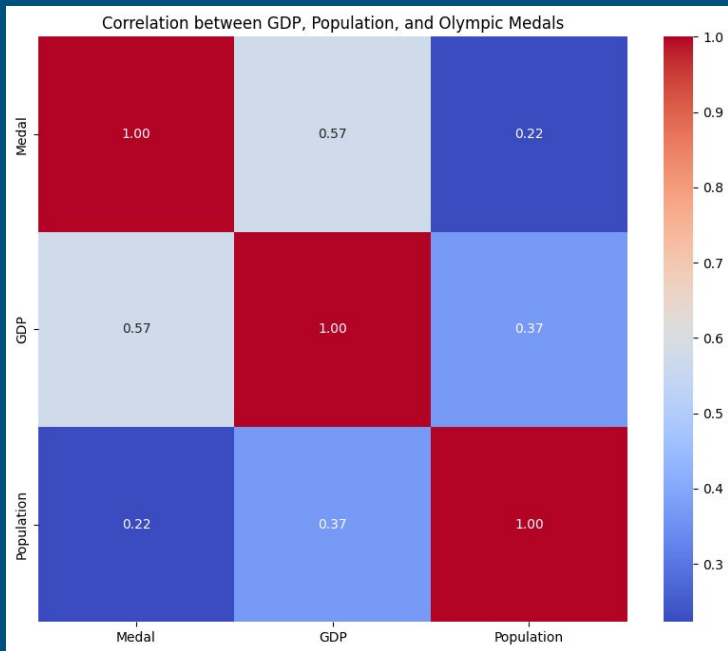
Results: Olympic Performance and Population



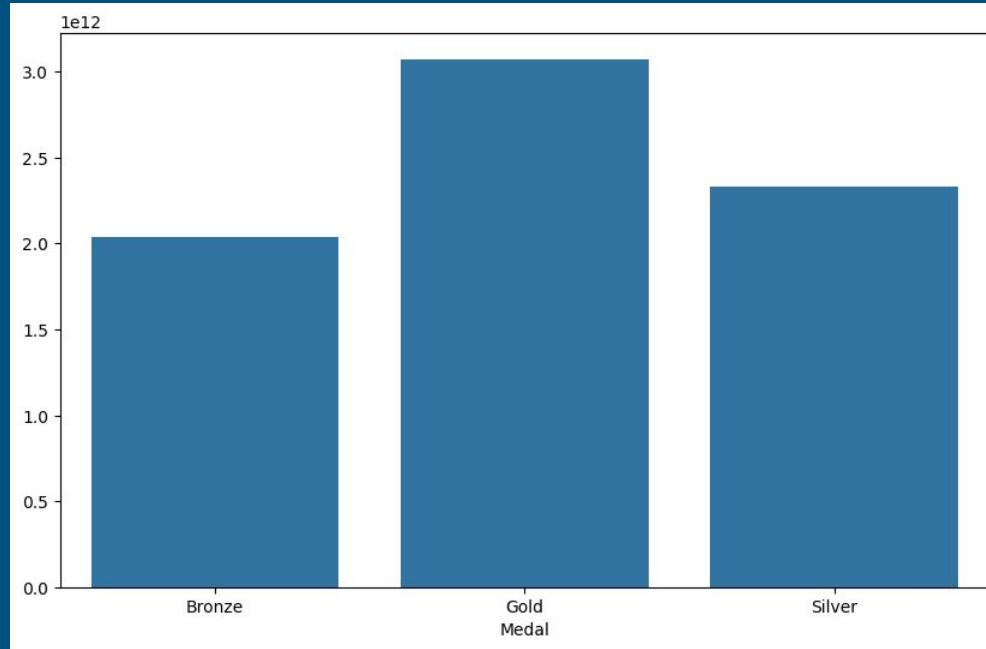
Results: Correlation Scatter Plot Between GDP and Medal Counts of Respective Countries



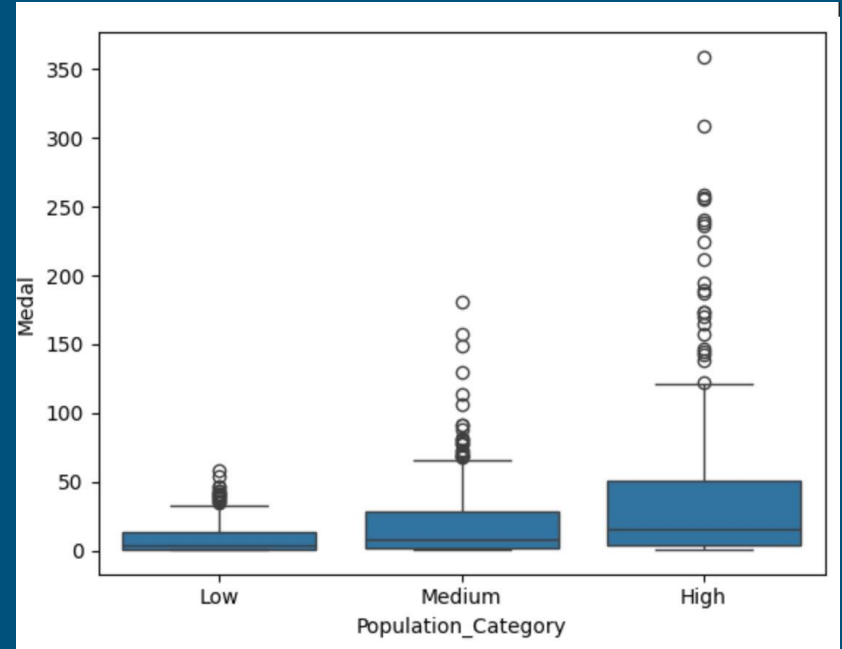
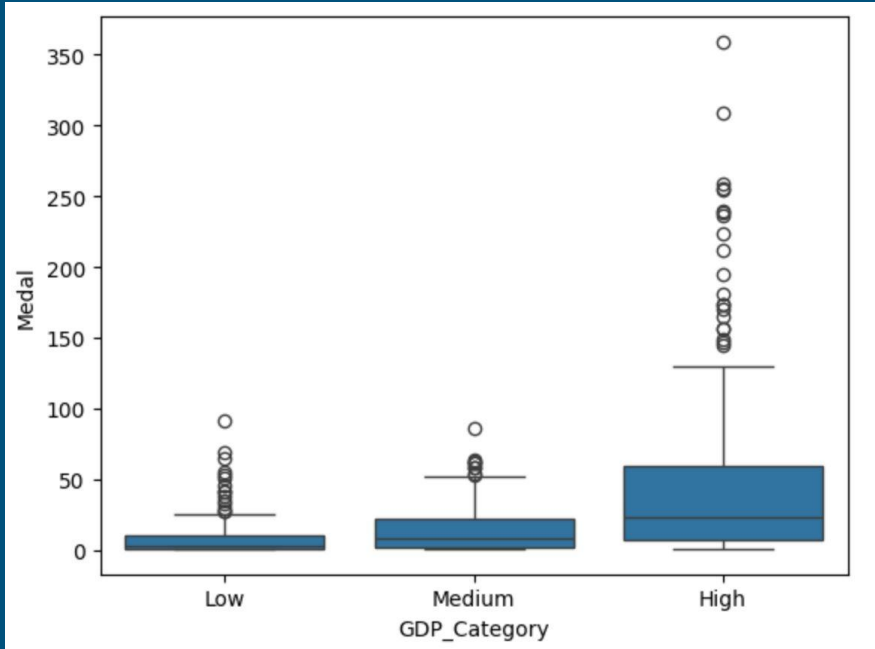
Results: Correlation Between GDP, Population, and Medals



Results: Bar Plot of Average GDP by Medal Type



Results: Comparison between GDP and Population



Conclusion

- The data appears to support our original hypothesis that GDP is a better indicator of Olympic success rather than population
- GDP had a stronger relationship with Olympic success whilst population had a moderate to strong relationship
 - Though, across the board, they are both in themselves good indicators of Olympic success
 - Of course, there are some caveats with our conclusion.

Limitations to our Studies

- We only investigated GDP and population. There could be confounding variables in our project.
- Factors such as economic policies of the country, level of industrialization, and players' experience in sports can present us with different perspectives, rather than just looking at GDP and population.
- In terms of potential research, our suggestion is to investigate these other variables that can reveal hidden underlying reasons for the way that countries' perform in the annual Olympics.



Thank you for watching!

