Data Analytics: A Deep Dive into CO2 Emissions Dataset

OLATUNJI Damilare Emmanuel
Innocent Twagirimana
Jules Maurice Mulisa
Abdallah Bitunguranye

AGENDA


Introduction & Problem Statement
EDA: Top (5) Questions
Key Insights
Summary
Conclusion

Introduction

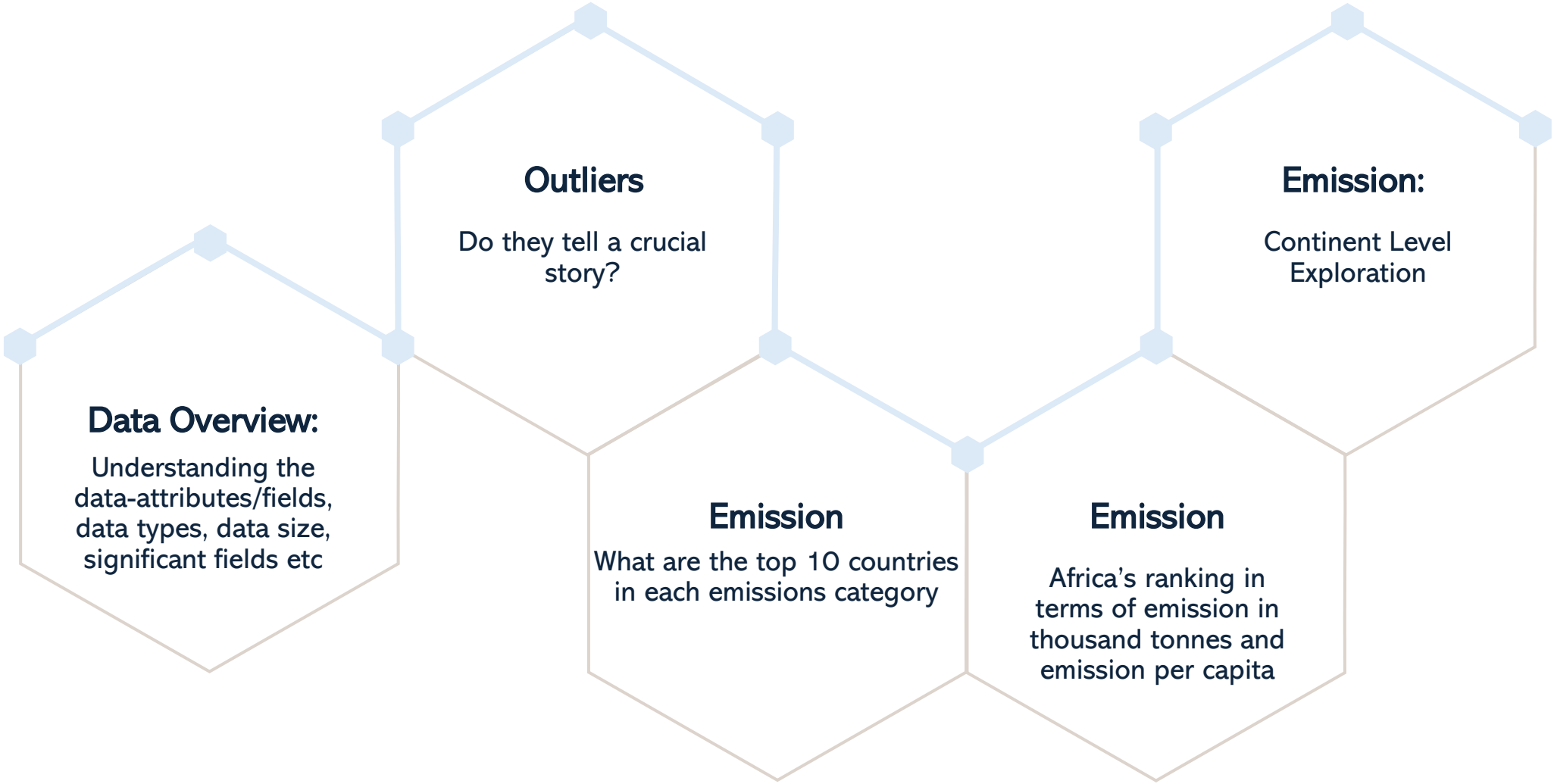
- Over the past four decades, the global economy has experienced more than a twofold increase, marking a remarkable achievement [1].
- This surge has, in turn, closely influenced the levels of CO2 emissions [2] as underlying activities from these factors include burning of oil, coals, petrol and many others [3].
- Therefore, the exploration of the intricate relationship between economic progress and CO_2 emissions, the identification of top continents significantly contributing to global warming, and the recognition of key contributing countries within these continents have spurred an investigation into the United Nations dataset.

https://depositphotos.com/photos/co2-emissions.html

Methodology

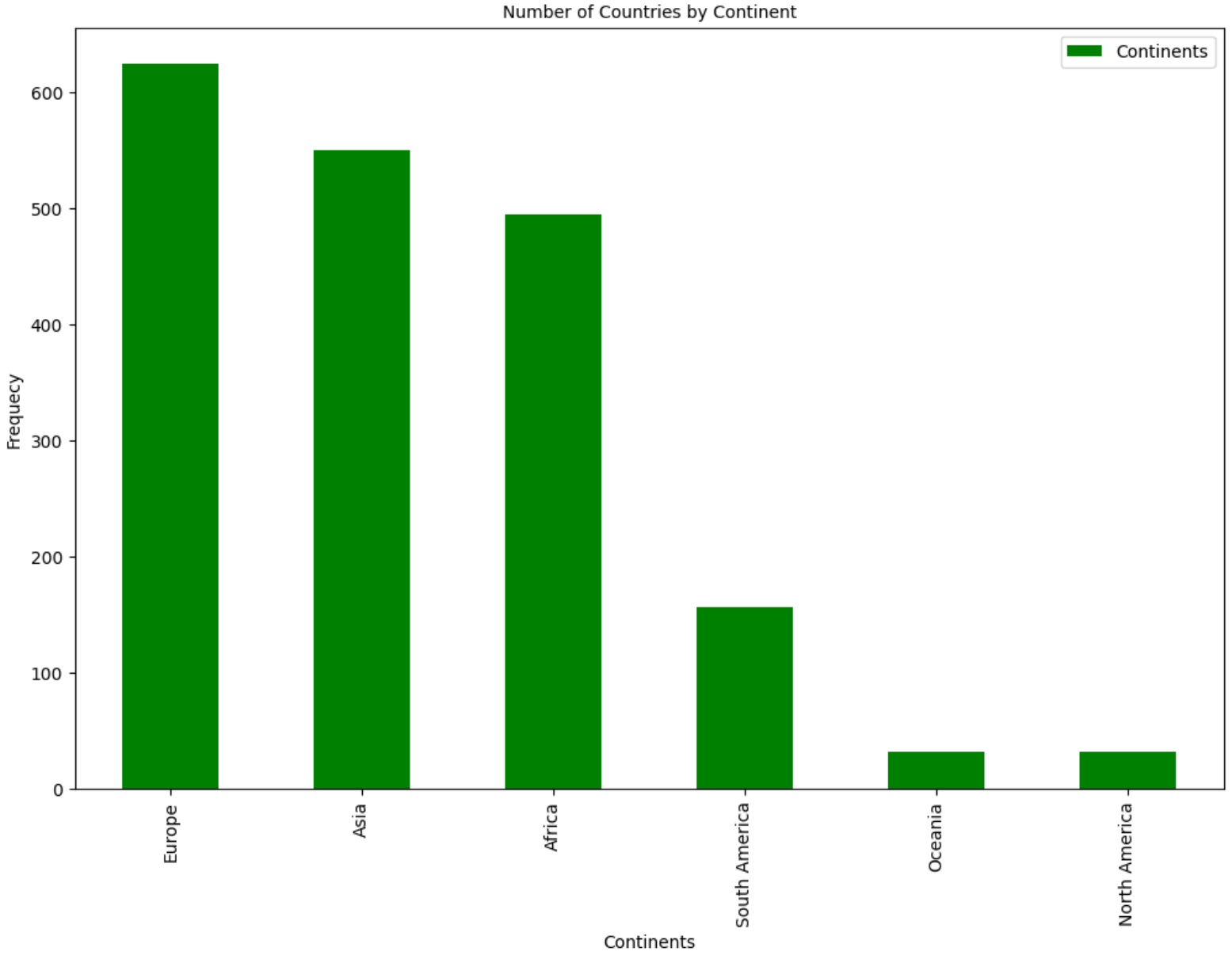
- The methodology adopted in utilizing the UN dataset involved a systematic and structured approach. Here are the key undertaken steps:

EDA: Top (5) Questions



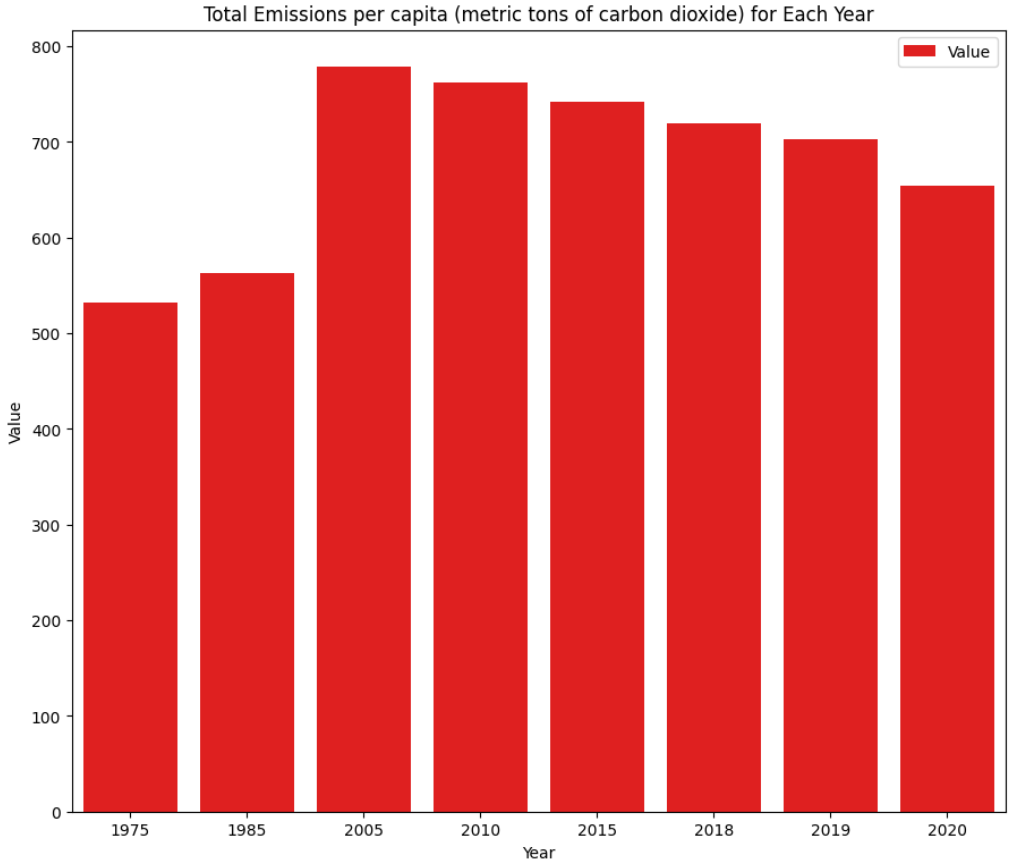
Keys trends, patterns, and relationships from the data

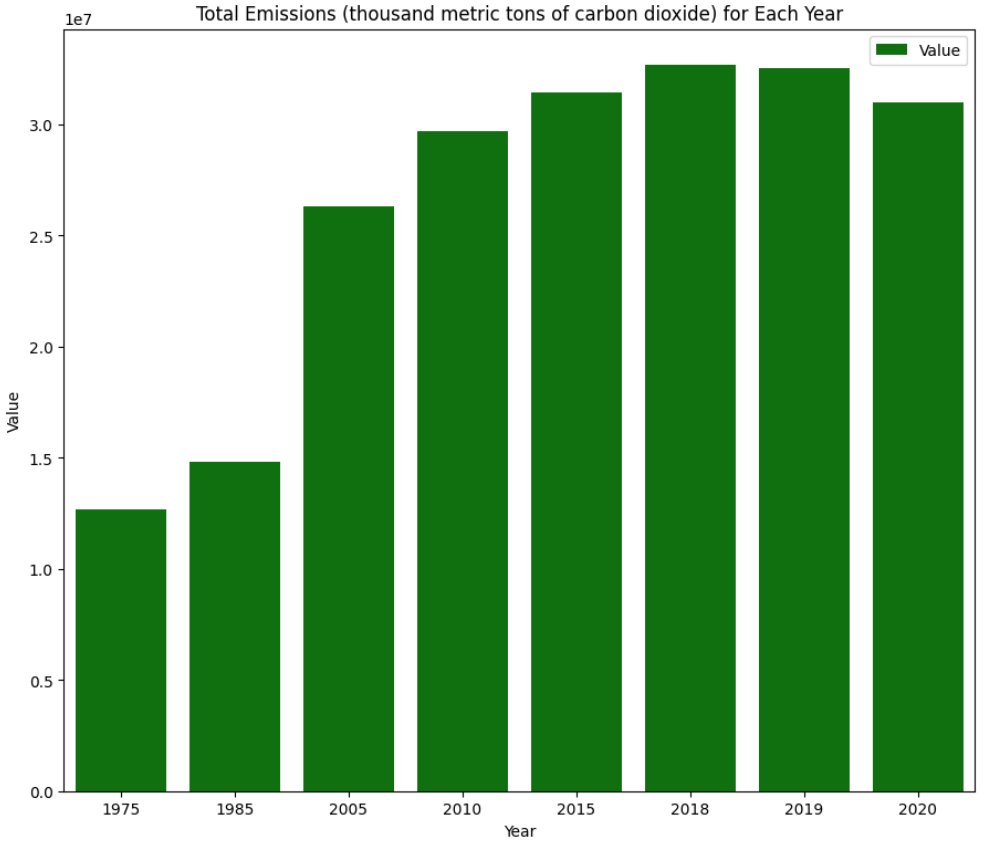
The dataset primarily comprises countries from Europe (a larger percentage) compared to other regions. Conversely, Oceania and North America are represented by relatively fewer countries..



Keys trends, patterns, and relationships from the data

Total emissions made between 1975 to 2020



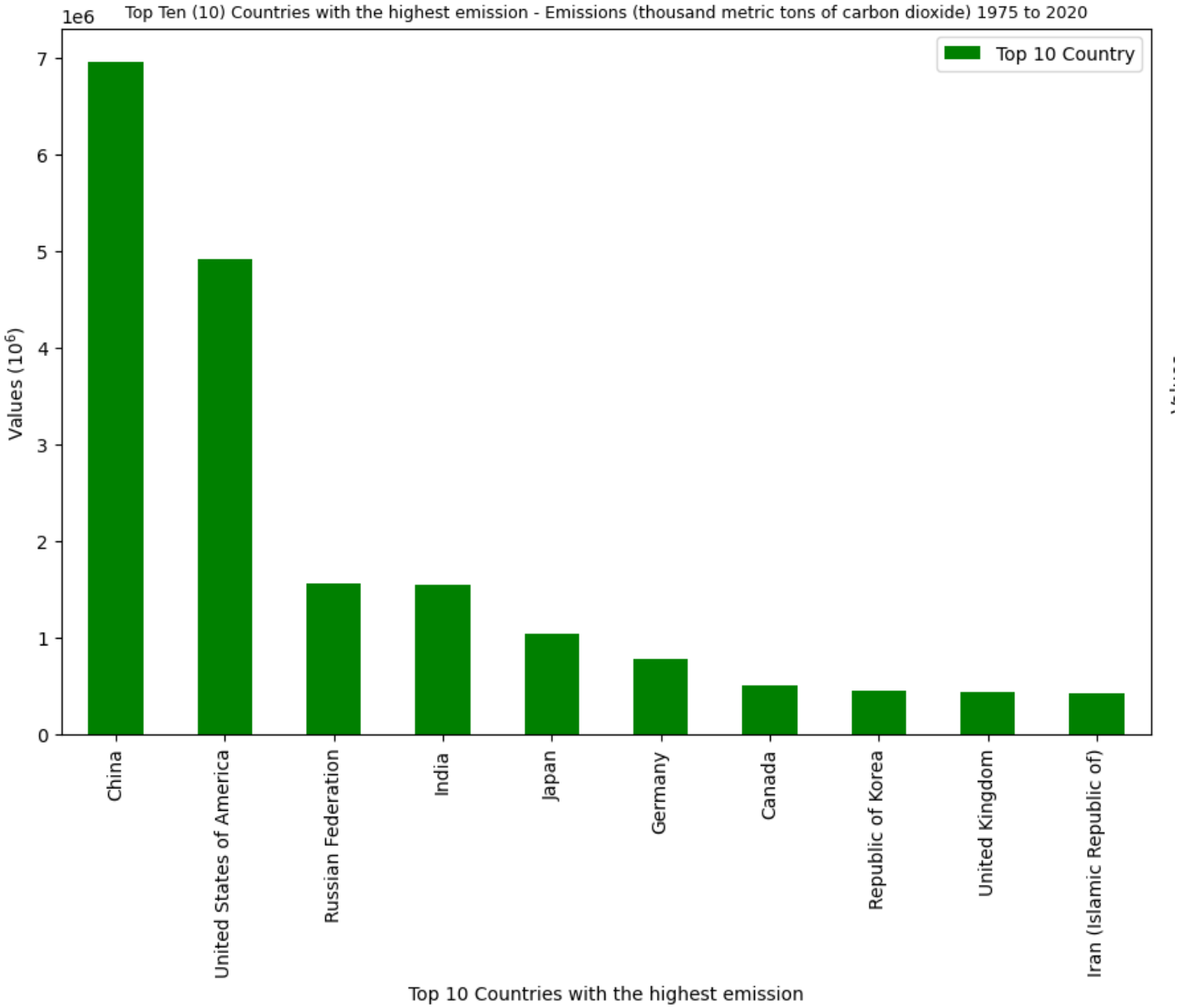


Upward trajectory observed up until 2005. Subsequently, from 2005 there was decrease in emission. This declining trend suggests a concerted effort time frame to reduce emission.

The total emissions measured in metric tons of carbon dioxide, showcased a consistent upward trend from 1975 to 2018

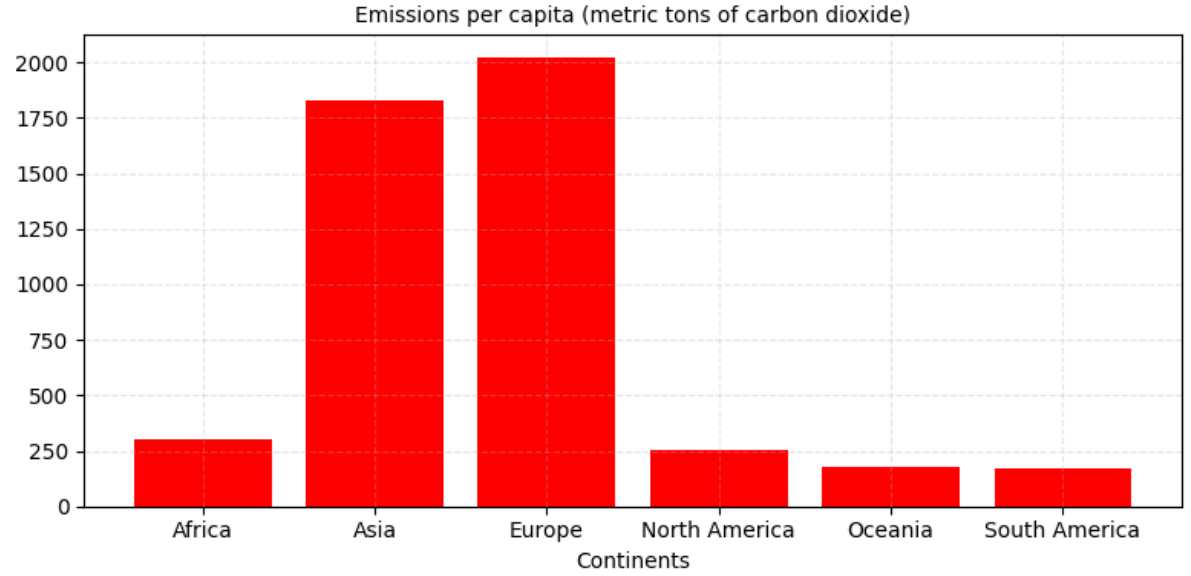
Keys trends, patterns, and relationships from the data

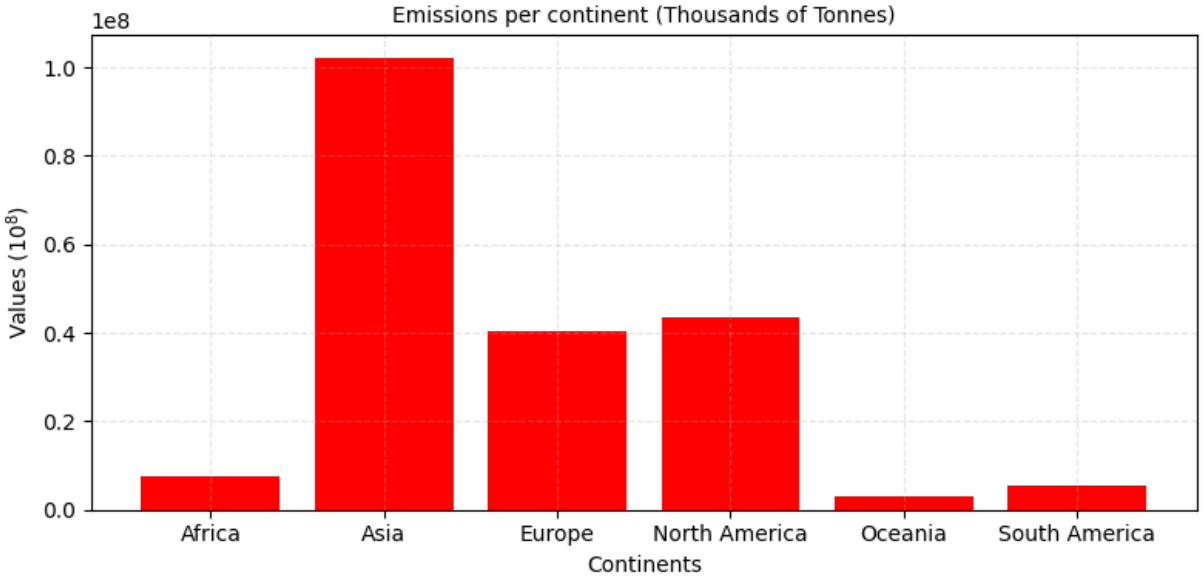
Top ten (10) countries with the highest emission



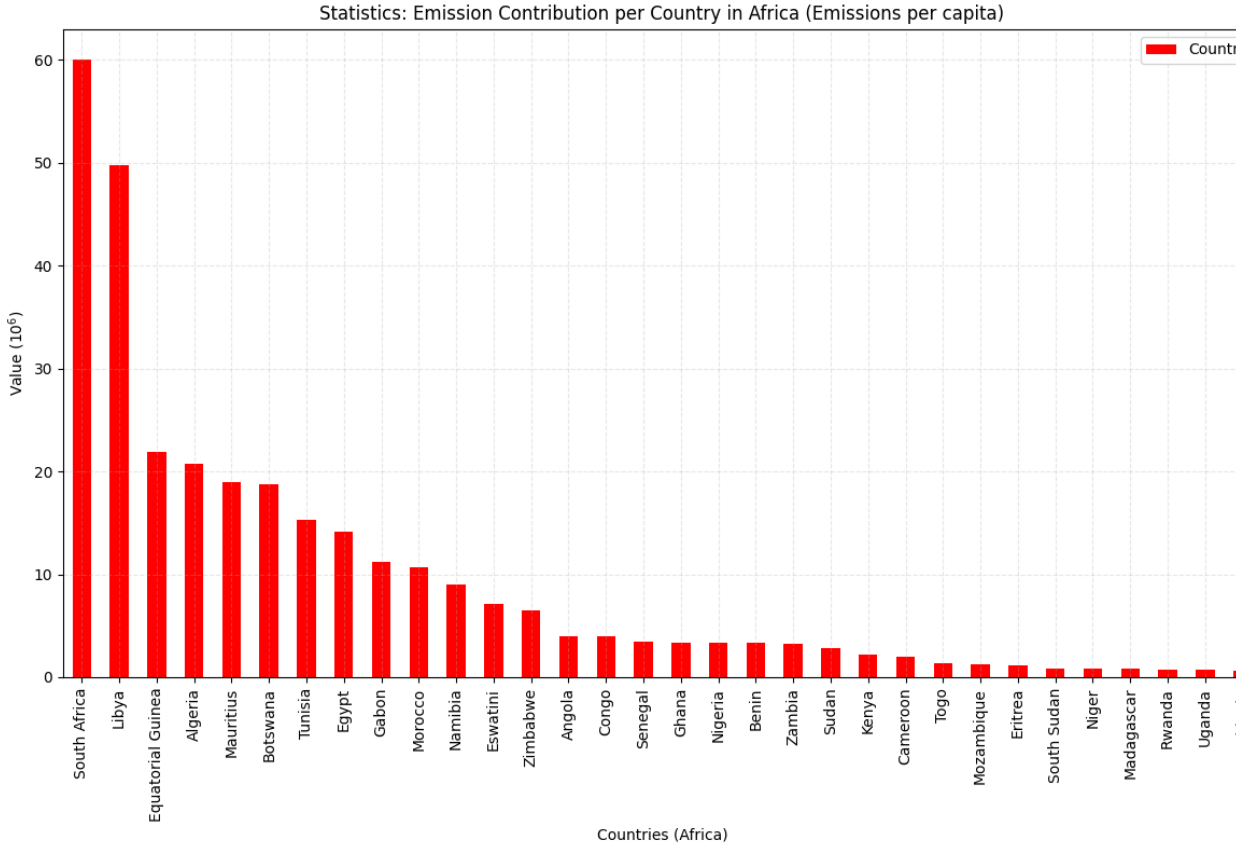
Keys trends, patterns, and relationships from the data

Continent Based Comparison Emission per capita (Metric Tons of Carbon Dioxide)

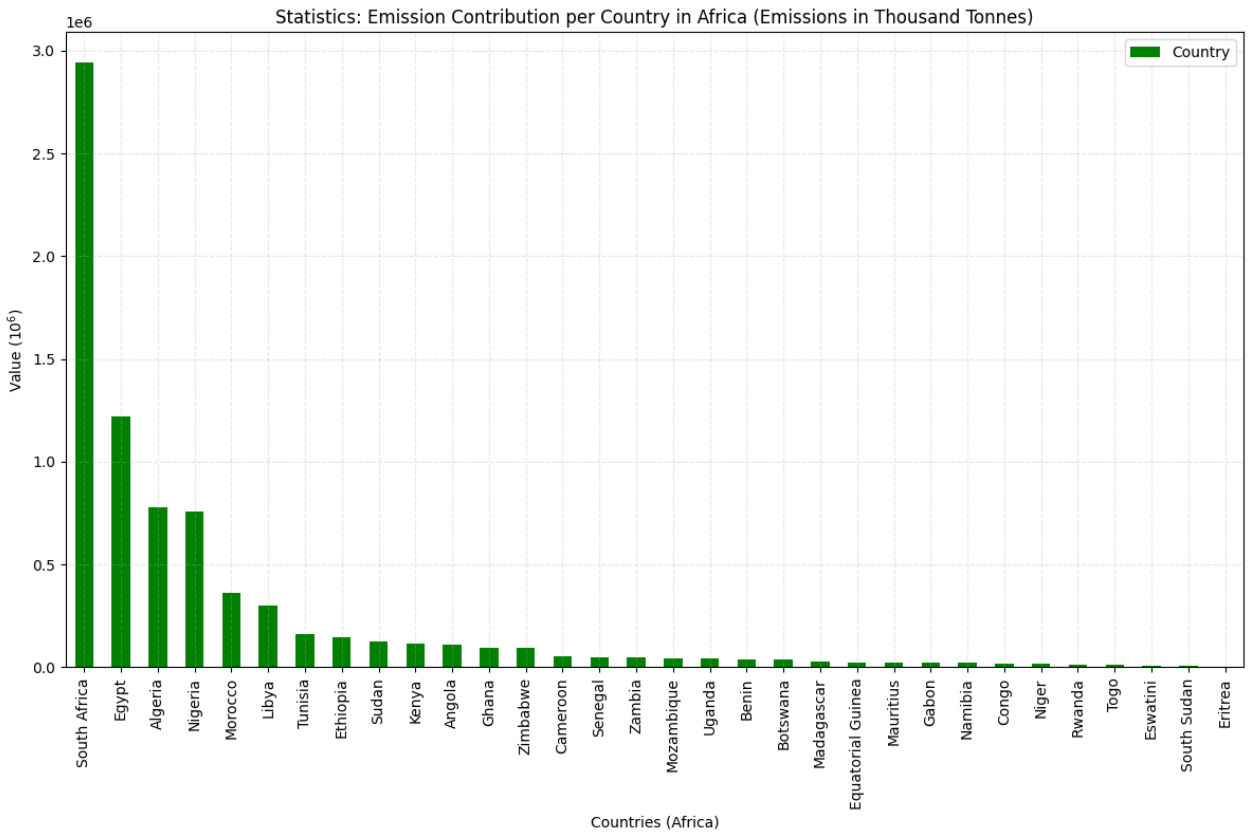




Keys trends, patterns, and relationships from the data



Ranking in Africa: Country-Based Comparison (Emissions per capita)



Ranking in Africa: Country-Based Comparison (Thousand metric tons)

Summary of key insights related to the five (5) questions in a) above.

- **Overview:** The comprehensive dataset provided by the United Nations, encompassing data from 1970 to 2020 for 149 countries and their respective CO2 emission contributions.
- The emission record is into two categories:
  - Emissions (thousand metric tons of carbon dioxide) and
  - Emissions per capita (metric tons of carbon dioxide)

- In Africa, South Africa is notably the largest contributor to CO2 emissions.

- With more than 102 million metric tons of CO2 emissions, Asia leads the continent-based comparison. This enormous number illustrates how Asia distinguishes out due to its quick urbanization, industrialization, and population expansion. [4]

- The presence of 168 outliers in the emissions dataset suggests a considerable number of data points that exhibit noteworthy deviations from the general trend.

Conclusion

- Exploring the UN CO2 dataset has yielded valuable insights into the complex interplay among socioeconomic factors, geographical regions, and CO2 emissions.

- Crafting well-informed policies, promoting sustainable practices, and bolstering global initiatives against climate change can help reduce CO2 emissions.

https://www.linkedin.com/pulse/application-co2-refrigeration-system-food-industry

Reference

[1] P. Knox, J. Agnew, and L. McCarthy, "The Geography of the World Economy," 6th ed. Routledge, 2014. doi: 10.4324/9780203775189.

[2] P. K. Adom, W. Bekoe, F. Amuakwa-Mensah, J. T. Mensah, and E. Botchway, "Carbon dioxide emissions, economic growth, industrial structure, and technical efficiency: Empirical evidence from Ghana, Senegal, and Morocco on the causal dynamics," Energy, vol. 47, no. 1, pp. 314-325, 2012.

[3] University of California Regents, “Burning of Fossil Fuels,” Understanding Global Change, 2022. https://ugc.berkeley.edu/background-content/burning-of-fossil-fuels/

[4] “Global energy-related CO2 emissions by region 2022,” Statista. https://statista.com/statistics/205966/world-carbon-dioxide-emissions-by-region/ (accessed Nov. 17, 2023).

Thank You