

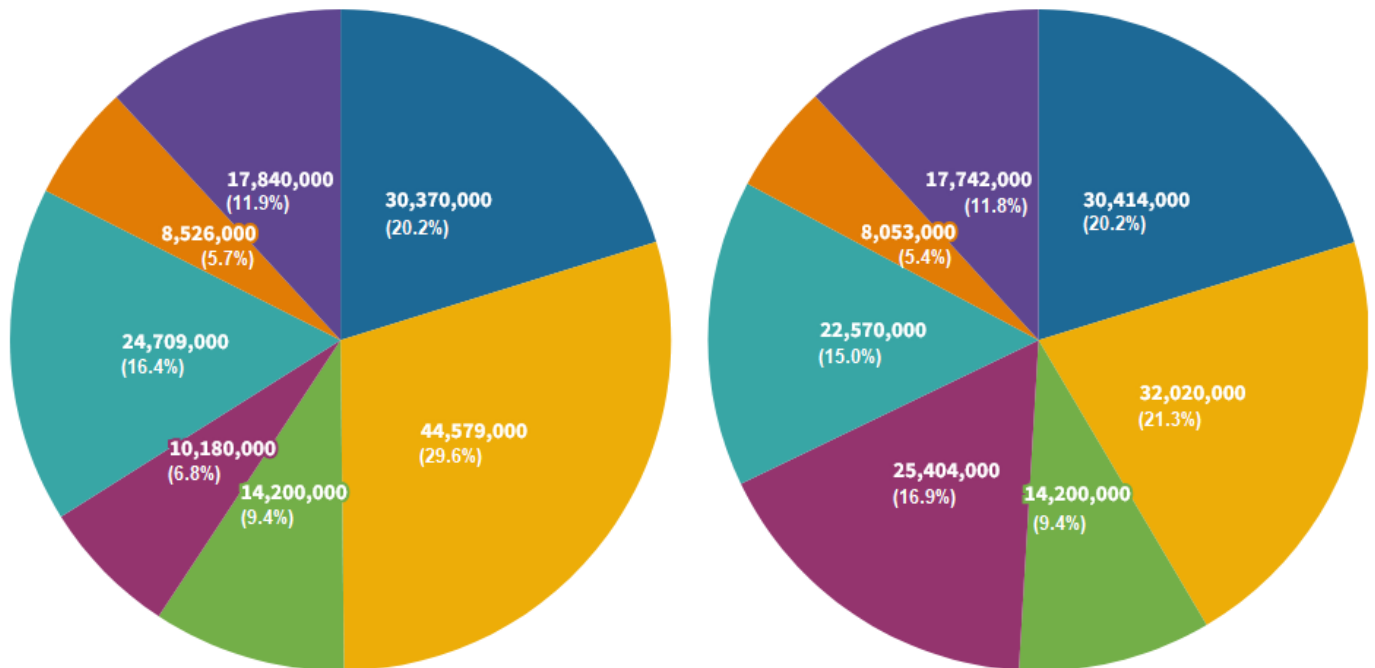
## The Size of Continents: Physical vs Political

Political size here is defined as the countries originating in the continent including their overseas possessions. All numbers are in square kilometers.

Africa Asia Antarctica Europe North America Oceania South America

Physical Size

"Political" Size



Source: Square kilometer sizes from National Geographic's Atlas of the World, 11th Edition

Figure 1: The Size of Continents: Physical vs Political

### Analysis

Analyze the above graph illustrating the physical and political size of continents.

**Question: Is there one (or more) question addressed by the visualization?**

The question is quite clear: what is the comparison between the physical and the political size of continents? Which continents have countries with overseas possessions?

**Data: Is the data quality appropriate?**

Accuracy: data are in square kilometers and they represent the size of continents. The values are reasonable and they appear accurate.

Completeness: data are complete, as all continents are reported (even Antarctica).

Consistency: data are consistent, as they are obtained by summing the area of the countries per continent. The political size is obtained by considering the continent of the "main" country and not the physical continent.

Currency: data seem reasonably updated, but no year is reported.

Credibility: the source is reported and it is a very trusted book by National Geographic.

Understandability: the meaning of the data is very clear, it is the size of continents in square kilometers.

Precision: precision up to the thousands is appropriate for the task. There is no need to write the last three zeros.

**Visual Proportionality: Are the values encoded in a uniformly proportional way?**

The values are encoded in a proportional way and the percentages sum up to 100%. However, a pie chart is not appropriate because the comparison of areas (or angles) causes a perceptual proportionality problem due to Stevens's law.

**Visual Utility: All the elements in the graph convey useful information?**

All the elements available in the graph are useful. It is possible to argue that the percentages could be removed as they can be computed from the data.

**Visual Clarity: Are the data in the graph clearly identifiable and understandable (properly described)?**

In general the meaning of the data in the graph is clear. The usage of many colors results in a "rainbow" chart. The use of direct labeling would have been more appropriate.

**Design**

Design the visualization based on the following data structure.

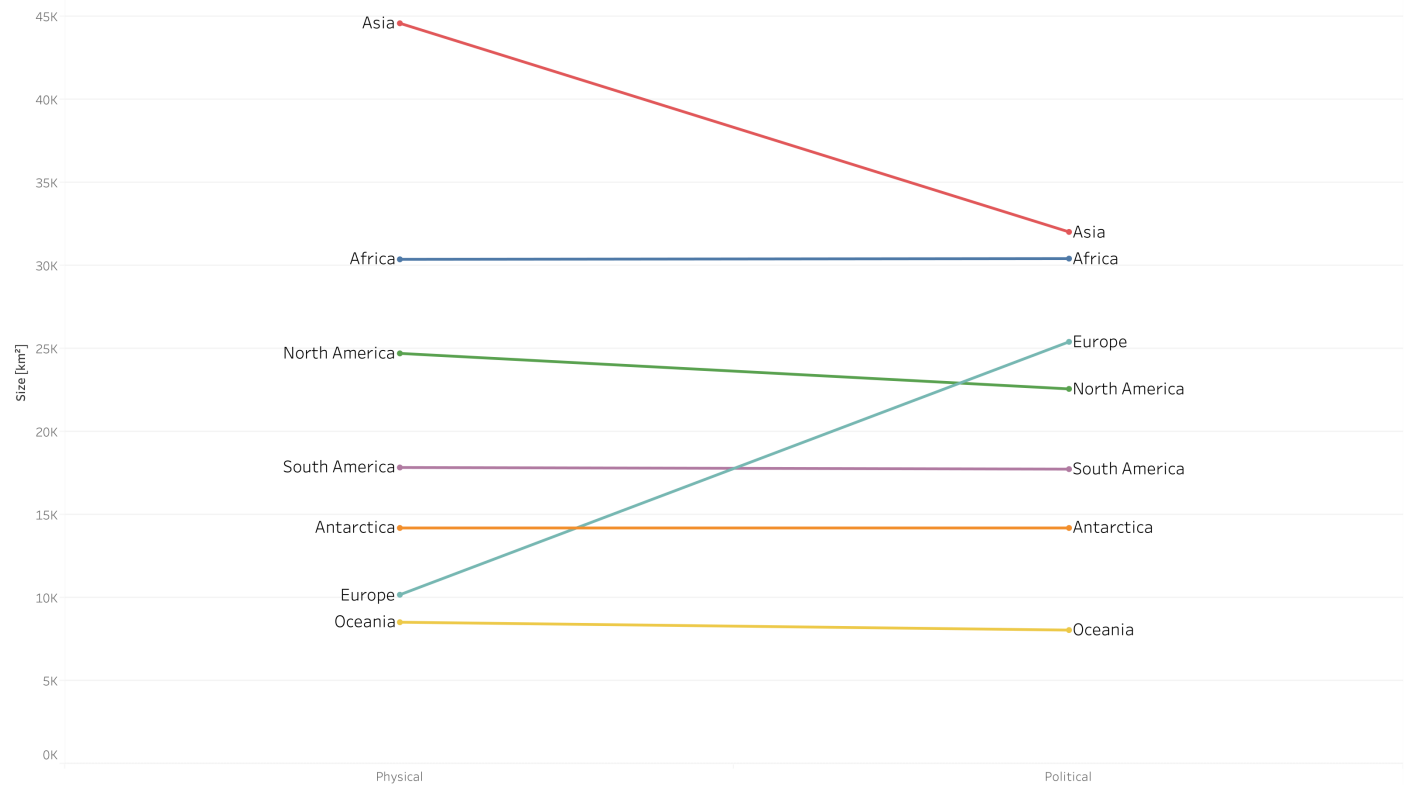
Field	Dim./Measure	Description
CONTINENT	Dimension	The name of the continent
PHYSICAL	Measure	The physical size in square kilometers
POLITICAL	Measure	The "political" size in square kilometers

## Design schema

Schema	Details
Columns:	Measure Names
Rows:	Measure Values [SUM(Physical), SUM(Political)]
Graph type:	Line
Color:	Continent
Size:	Default
Label:	ATTR(Continent)

## Sketch of the resulting graph

Slope chart

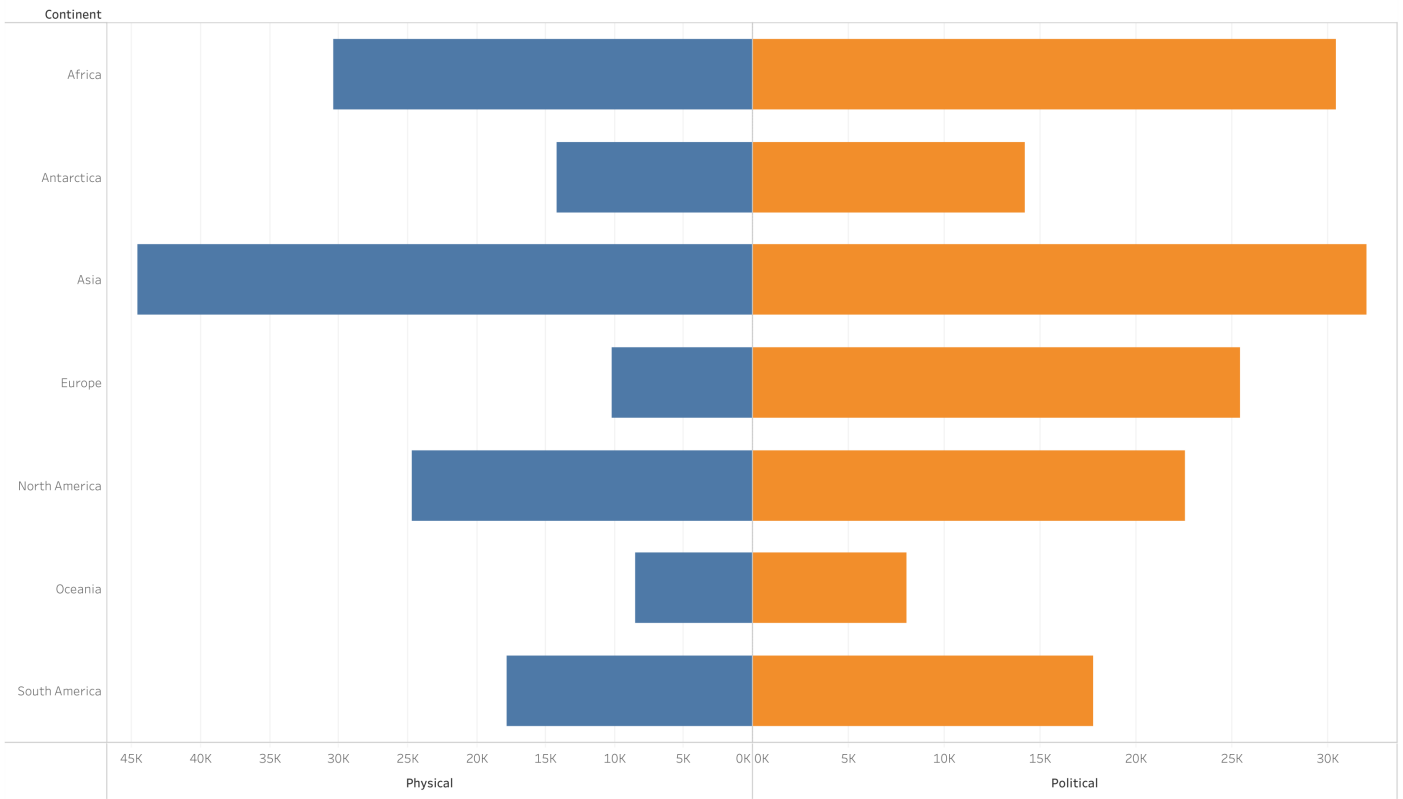


## Design schema

Schema	Details
Columns:	SUM(PHYSICAL), SUM(POLITICAL)
Rows:	CONTINENT
Graph type:	Bar
Color:	Measure Names
Size:	Default
Label:	Default

## Sketch of the resulting graph

Diverging bar chart

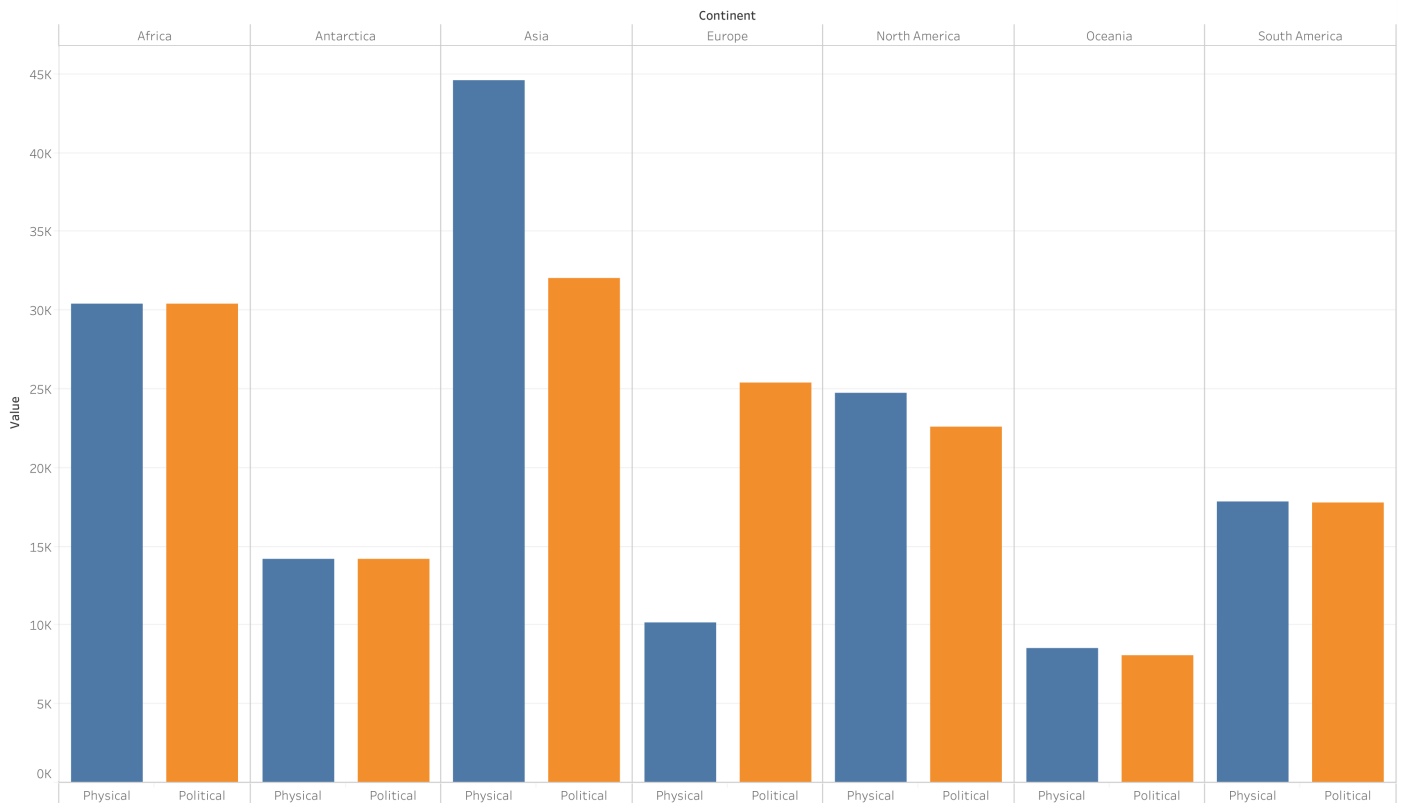


## Design schema

Schema	Details
Columns:	CONTINENT, Measure Names
Rows:	Measure Values [SUM(PHYSICAL), SUM(POLITICAL)]
Graph type:	Bar
Color:	Measure Names
Size:	Default
Label:	Default

## Sketch of the resulting graph

Vertical bar chart



## Design schema

Schema	Details
Columns:	SUM(PHYSICAL)
Rows:	SUM(POLITICAL)
Graph type:	Shape
Color:	Default
Size:	Default
Label:	CONTINENT

## Sketch of the resulting graph

Scatter plot



## Theory

Which of the following answers is **NOT** a solution to the overplotting problem?

- Use of small shapes
- *Use of multiple shapes*
- Use of outlined shapes
- Use of transparent shapes
- Use of jittering