

Figure 1: Billionaires Net Worth

### Analysis

Analyze the above graph according to the following criteria.

### Question

Which one of the following questions represents the purpose of this visualization?

- Which one is the richest billionaire?
- What is the rank of the richest billionaires?
- Which is the correlation between billionaires worth and their businesses?
- *What is the change of net worth of the richest billionaires in 2022?*
- What is the trend of net worth of the richest billionaires over several years?

### Data

Is the data quality appropriate? Select true answers only.

- Data is not accurate as the values look too rounded to be real.
- Data is not consistent as different periods of time are considered to measure the net worth.
- *Data is not complete because only 10 billionaires have been considered.*
- Data is updated to the first half of 2022.
- *Data is understandable as the meaning the values is clear (billions of dollars).*
- *Some values are reported without decimal digits while others with one decimal digit.*

- Data is not credible because the source available is not a trusted one.
- Data is complete because several billionaires are considered.
- Data is not understandable because different unit of measures are used.
- *The net worth should have been measured on 1st January 2023, not on 15th December 2022.*

## Visual

### Proportionality

Are the values encoded in a uniformly proportional way?

The values represented in the graph appear to be proportional, given that the y-axis starts from zero and the length of the bars seems consistent with their values. However, the presence of the billionaires' faces covering parts of the bars makes it difficult to visually compare the data, and the fact that the orange bars are wider than the grey bars may be altering the proportions.

### Utility

All the elements in the graph convey useful information?

Some elements in the graph are unnecessary and could be removed. The faces are distracting and do not add any valuable information. Similarly, the comments about some billionaires could also be removed. The logo in the bottom right corner could also be avoided. The numbers near the bars are useful for comparison.

### Clarity

Are the data in the graph clearly identifiable and understandable (properly described)?

Direct labeling is a good way to compare values easily. The billionaires' faces cover the end of the bars, making it hard to compare the scale of the data. The bars are ordered from left to right, but they have some problems. The vertical numbers are hard to read, and the grey bar is partially covered by the orange one. The x-axis and y-axis are clear, but it would be better to add a name to the y-axis. The numbers for December 2022 are thicker than those for January 2022, which may distract readers.

## Design

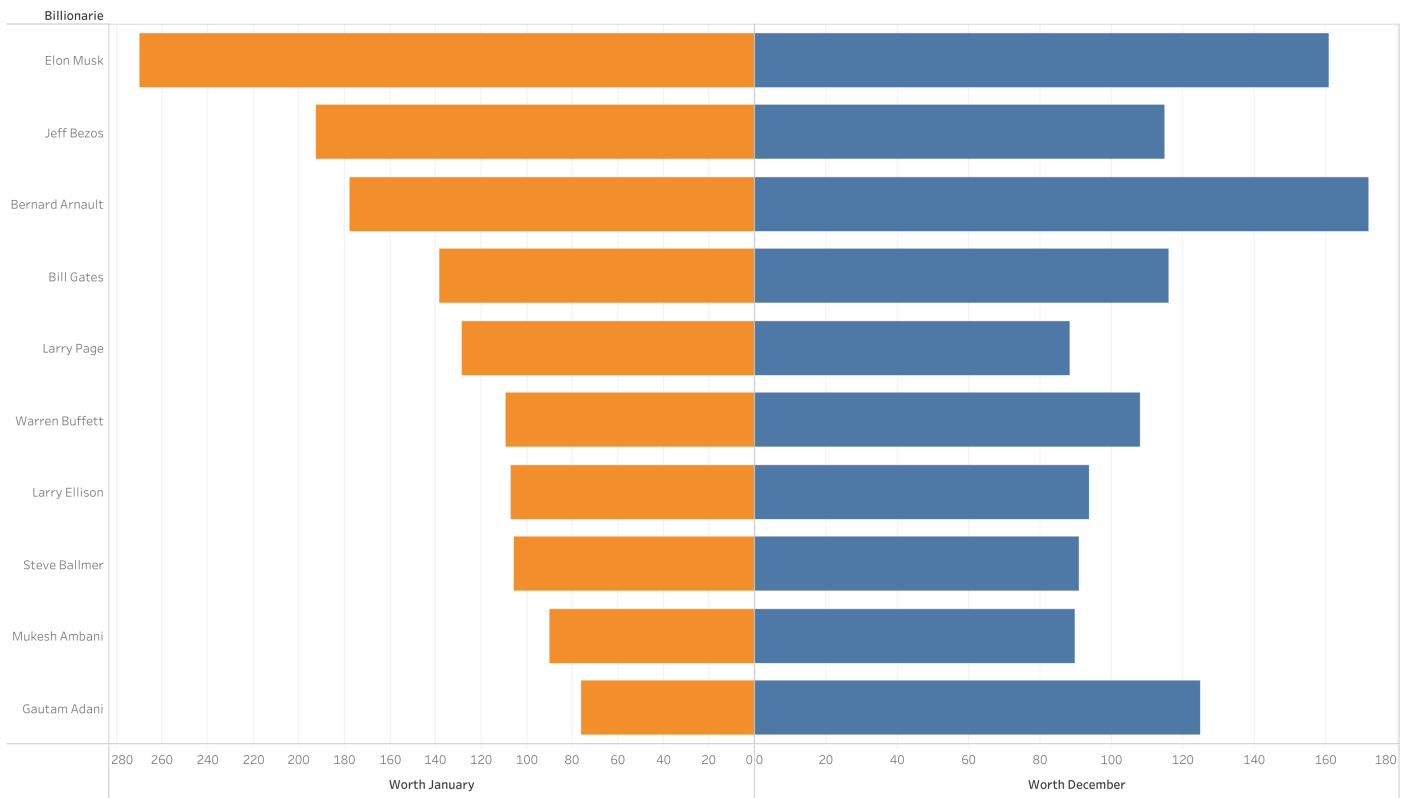
Design the visualization based on the following data structure.

Field	Dim./Measure
WORTH_JANUARY	Measure
WORTH_DECEMBER	Measure
BILLIONARIE	Dimension

## Design schema

Schema	Details
Columns:	SUM(WORTH_JANUARY), SUM(WORTH_DECEMBER)
Rows:	BILLIONAIRE
Graph type:	Bar
Color:	Measure Names
Size:	Default
Label:	Default

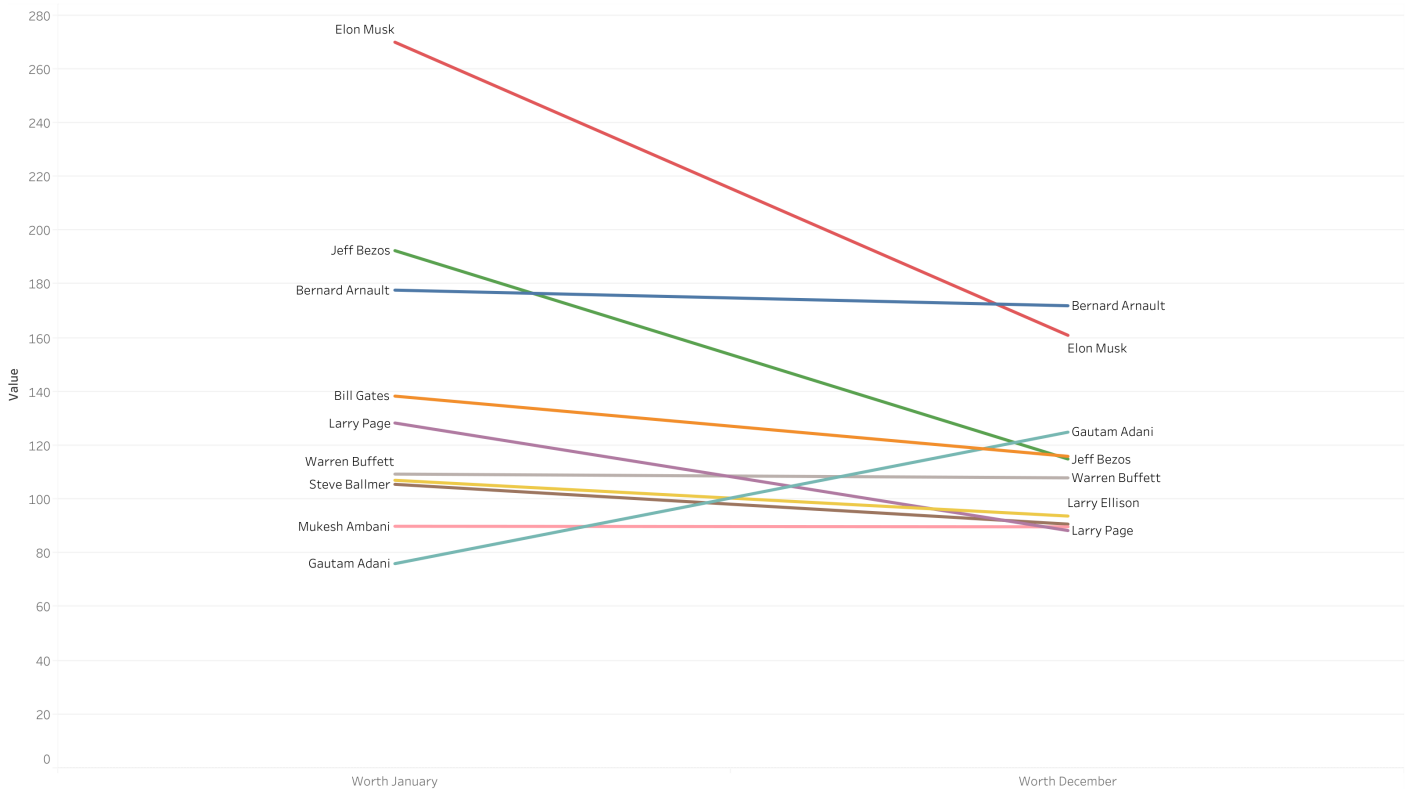
## Sketch of the resulting graph



## Design schema

Schema	Details
Columns:	Measure Names
Rows:	Measure Values
Graph type:	Line
Color:	BILLIONARIE
Size:	Default
Label:	BILLIONARIE

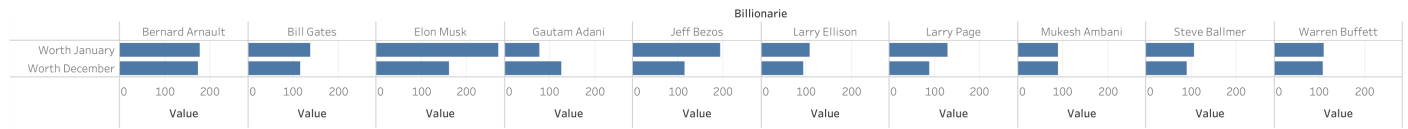
## Sketch of the resulting graph



## Design schema

Schema	Details
Columns:	BILLIONAIRE, Measure Values
Rows:	Measure Names
Graph type:	Bar
Color:	Default
Size:	Default
Label:	Default

## Sketch of the resulting graph



## Theory

Which one of the following sentences related to discretization (or quantization) is true?

- Discretization is a technique that maps ordinal measures into quantitative ones
- Discretization can be applied without creating intervals of values
- Discretization must be used to encode values with a color scale
- *Discretization could be used to encode an ordinal-friendly visual attribute*
- Discretization may increase the precision of the measures