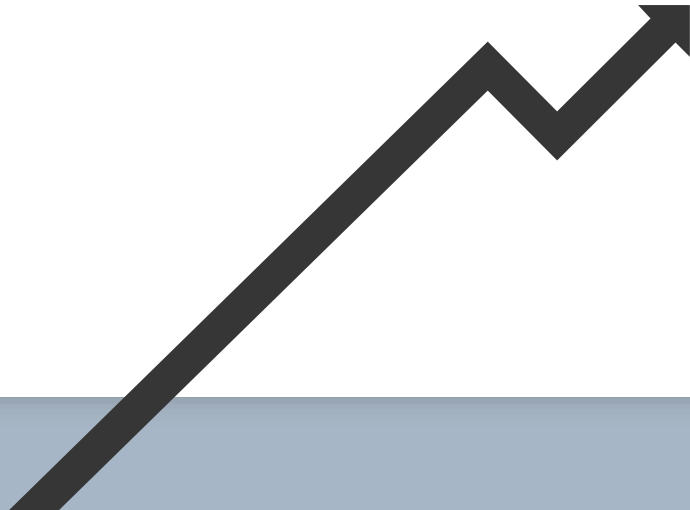




Consumer Price Index



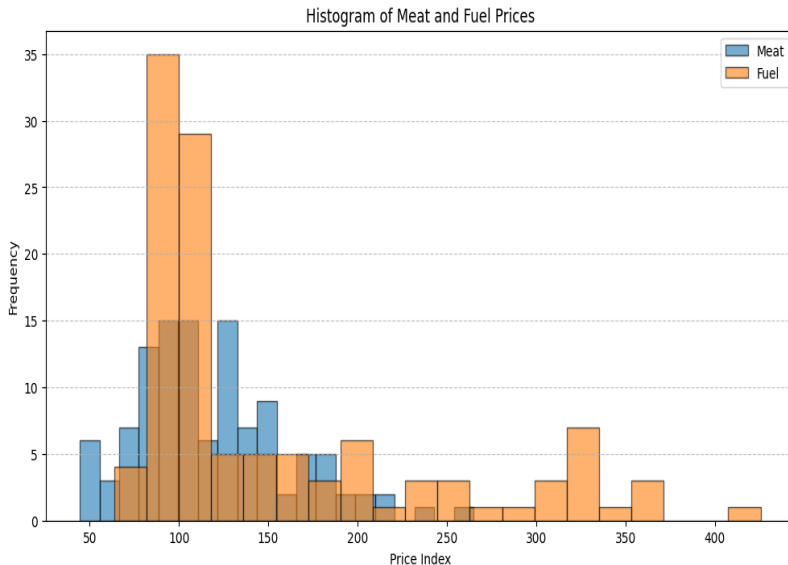


1. Is there a significant difference in the price of meat compared to the cost of fuel?

Sheet 1



Data.Fuel.Average vs. Data.Meat.Average.



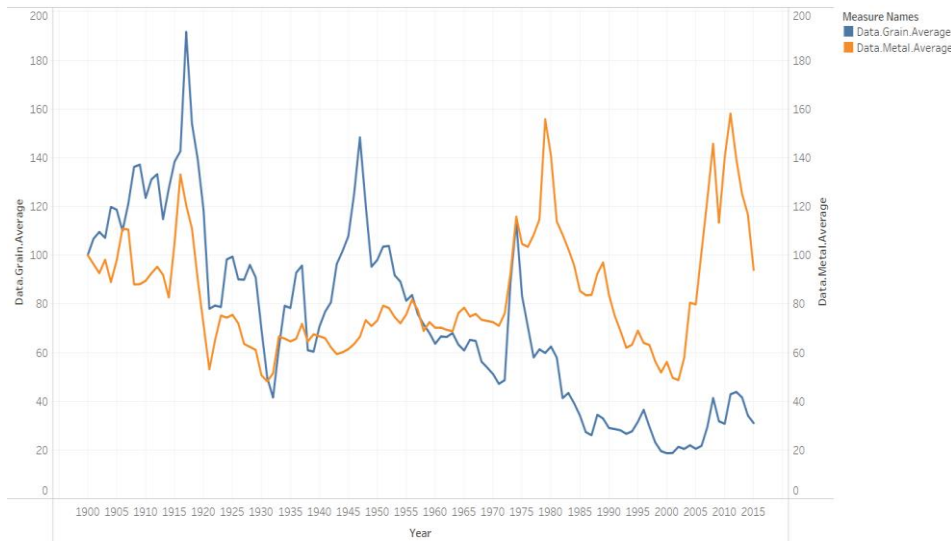
The average fuel price is significantly higher than the average meat price. In general sense, the price dynamics between meat and fuel is understandable. From the plots, we can see that there is a **significant difference** in the price trends and variability between meat and fuel.

Therefore, fuel prices are generally higher and more volatile than meat prices.



2. Are there any observable relationships between the price of grain and the price of metal?

Sheet 2



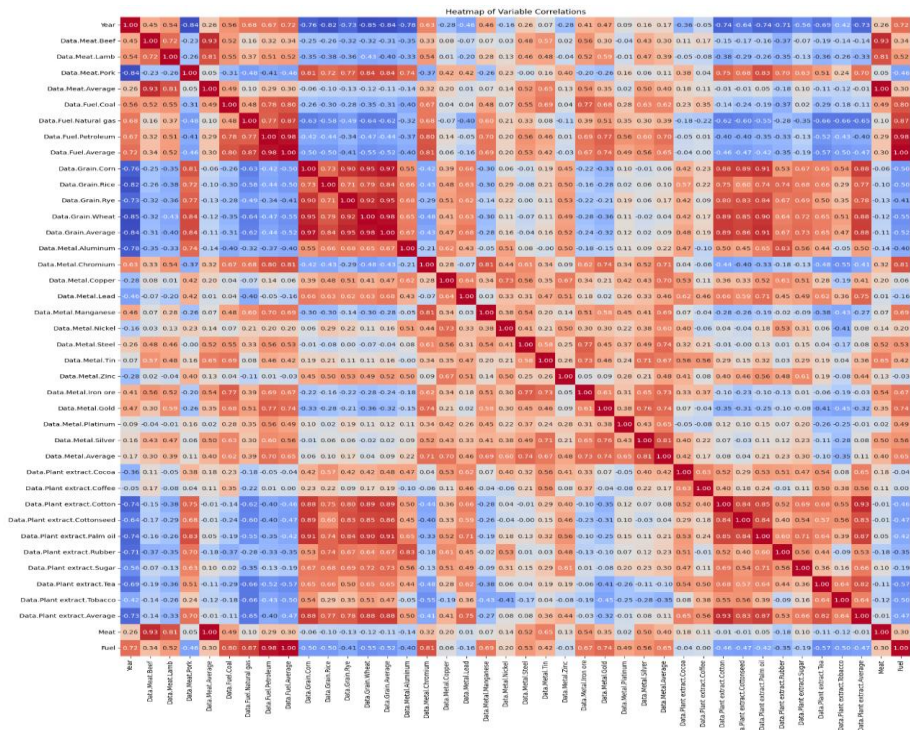
This line plot shows the trends of grain and metal prices over time and highlights their independent volatility patterns and occasional periods of synchronized movements. Grain and metal prices exhibit different volatility.

The prices of grain seem to be relatively stable with smaller fluctuations while metal prices are highly volatile, with significant spikes and drops over time.

In certain time periods (e.g. 1980-2000), both prices appear to increase or decrease together, but they diverge in other periods.



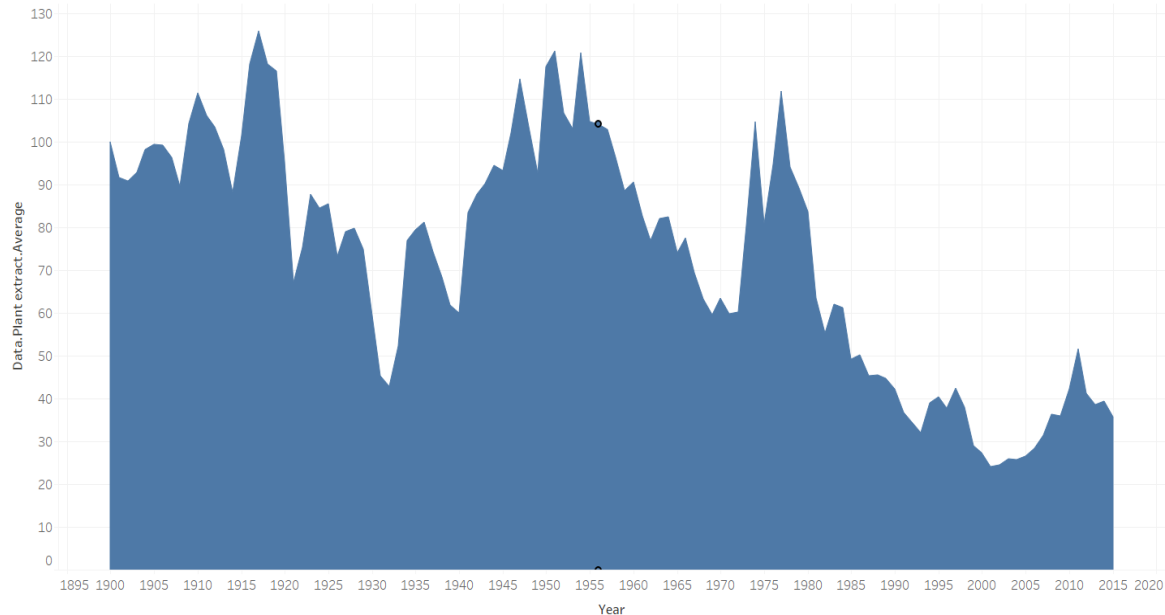
3. What attributes in the dataset are positively correlated to each other? What attributes in the dataset are negatively correlated to each other?





4. Have the prices of plant-based products evolved over time?

Sheet 4



The plot of sum of Data.Plant extract.Average for Year.

We can clearly see that indeed, the prices of plant extracts change every year.

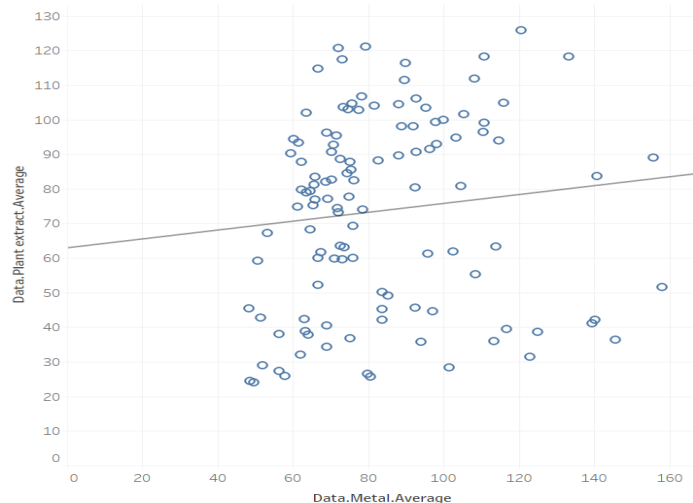
The plot shows high volatility especially from 1900-1980. Significant fluctuations are observed, with peaks around 1915 and 1950s to 1960s.

The price indices exhibit a steady decline from 1980–2000.

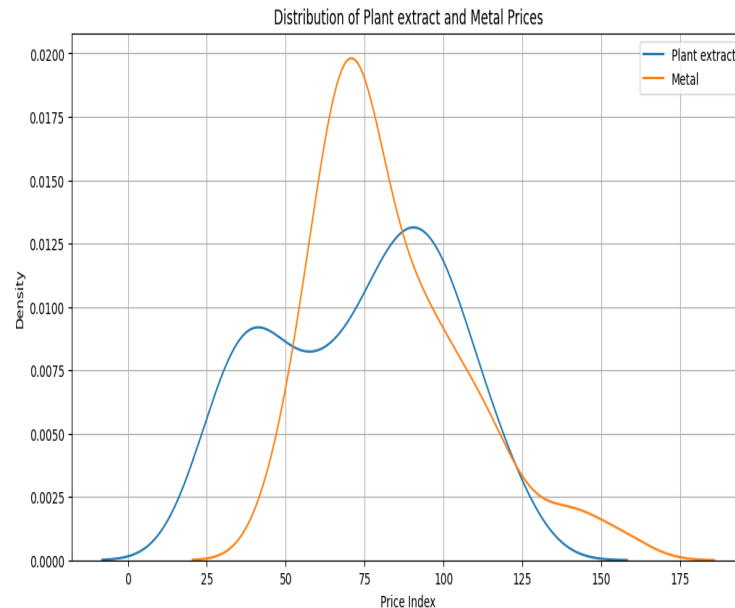


5. What is the variability between the price of plant extract and the price of metal?

Sheet 5



Data.Metal.Average vs. Data.Plant extract.Average.



The scatter plot shows a weak positive trend between the prices of plant extracts and metals. The price distribution for plant extracts is broader, indicating greater variability in price compared to metals. Metal prices have a more concentrated distribution, suggesting more consistent pricing, likely due to stable industrial demand.

< Generative AI Usage



I sent the dataset to ChatGPT(model 4o) to analyze and also provide me with the two other guiding questions.

Prompt 1 with response

Analyze this dataset (with the dataset attached)

Analyze this dataset



The dataset appears to be a historical record of consumer price indices (CPI) for various categories over time. Key details include:

- **Columns:** The dataset includes several categories related to food, fuel, and plant extracts, each with multiple subcategories (e.g., "Data.Meat.Beef," "Data.Fuel.Coal").
- **Years:** Data starts from the year 1900.
- **Values:** The indices seem normalized to 100 for the base year (1900), with subsequent years showing variations.

Suggested Analysis

Here are a few directions for analyzing this dataset:

1. **Trend Analysis:**
 - Explore how different categories have evolved over time.
 - Compare rates of change for specific commodities (e.g., meat vs. fuel).

This is a very good response as the AI model was able to analyze the dataset into details.

Prompt 2 with response

Give me 2 more guiding questions

1. How have the prices of plant-based products (e.g., cocoa, coffee, and cotton) evolved over time, and what factors might explain the trends?

- **Analysis Focus:** Investigate long-term trends for plant-based product prices, identify periods of significant change, and potentially correlate these trends with historical events (e.g., market demand, production, or global crises).
- **Visualization:** Use line plots or area charts to compare the price indices for plant-based products over time.

2. Are there any seasonal patterns or cyclic trends in the dataset?

- **Analysis Focus:** Examine the dataset for evidence of recurring trends (e.g., annual or multi-year cycles) in specific categories like food, fuel, or plant extracts.
- **Visualization:** Use line plots with time series data, overlaying moving averages or seasonal decomposition to highlight patterns.

Also, a good response as I got the motivation for the two guiding questions from it.