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Group #8

AIT 664-DL2

Data Preparation and Exploratory Data Analysis

Basic Statistics:

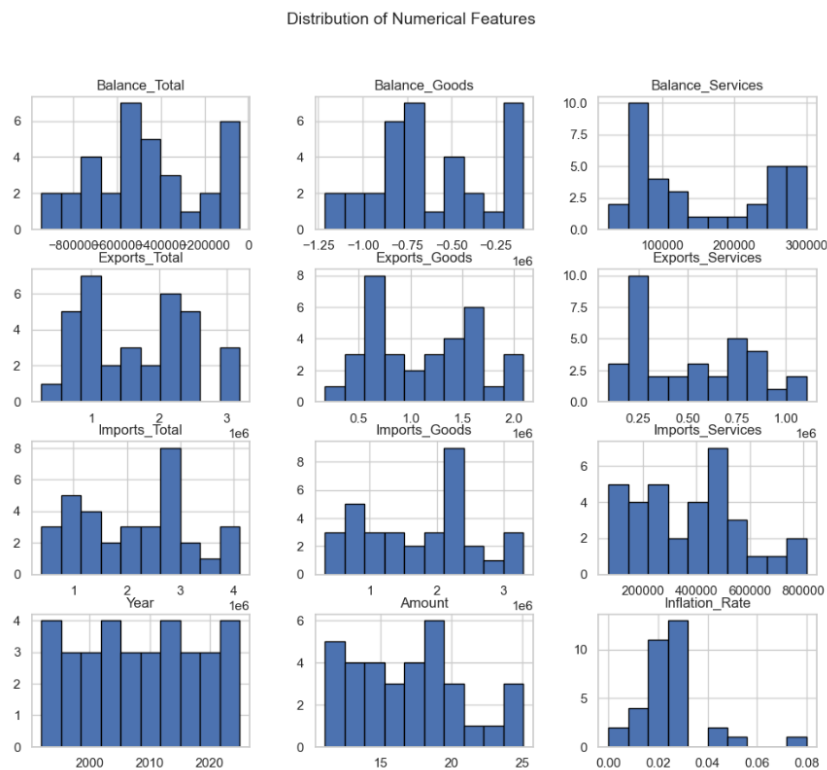
- The dataset contains 33 observations after cleaning (one for each year).
- The average Balance Total is -468,083, indicating a trade deficit.
- The average Exports Total is 1.67 million, while Imports Total is 2.14 million, reinforcing the deficit.
- The Inflation Rate ranges from 0% to 8%, with a mean of 2.53%.

Missing Values:

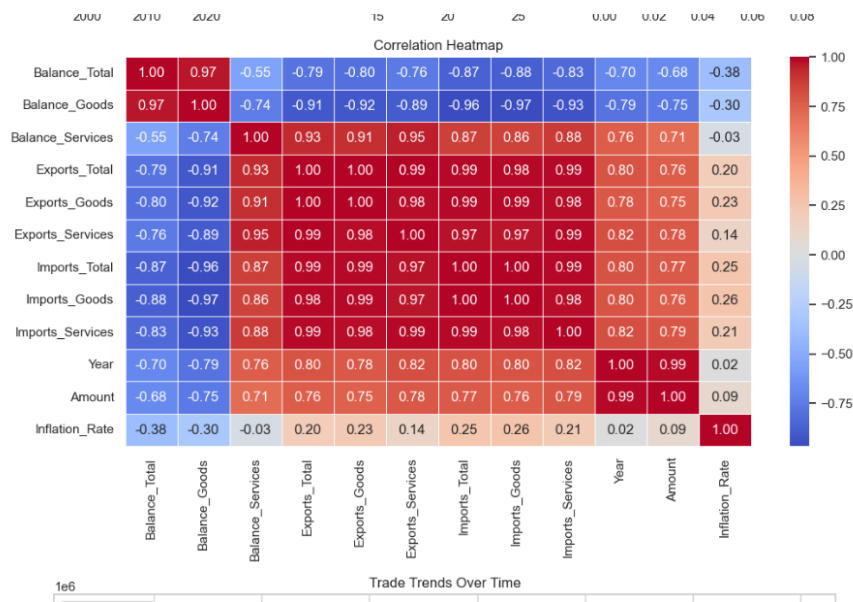
- I couldn't identify any missing values that remained after cleaning.

Visualization:

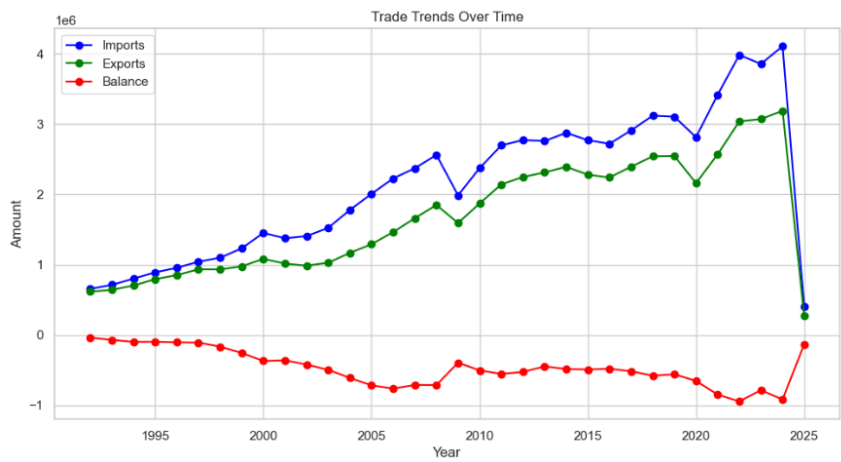
Histograms:



Heatmap:



Scatterplot:



Distributions:

- The histograms show that most of the imports, exports, and trade balance have a right-skewed distribution.
- Inflation Rate and Amount are more normally distributed.

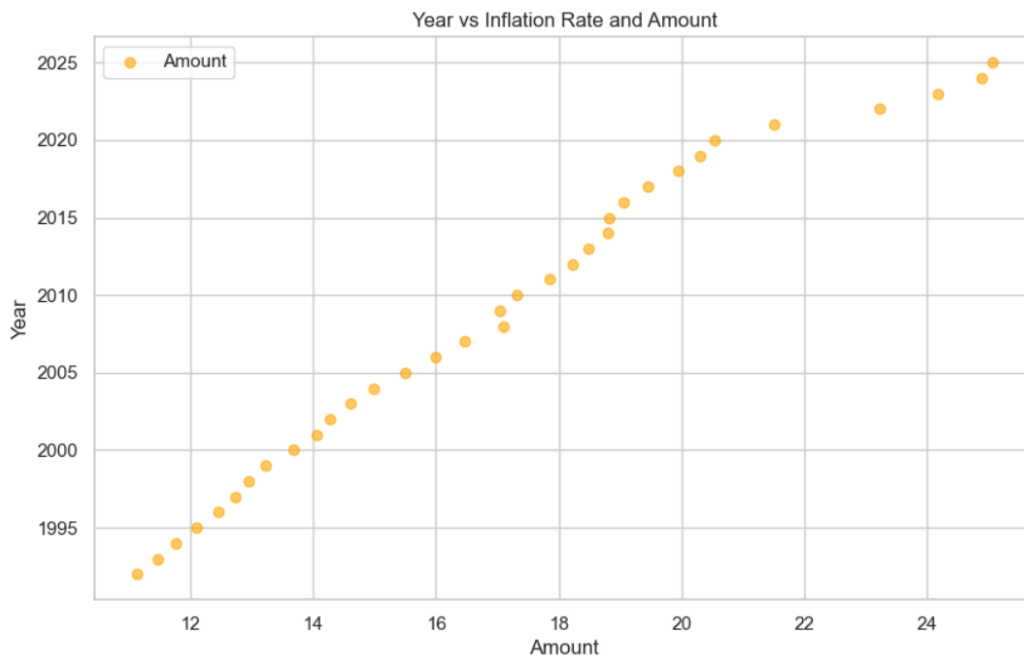
Correlation Analysis:

- Exports and Imports are highly correlated, which is expected and unsurprising.
- Inflation Rate does not appear to have a strong correlation with trade balances

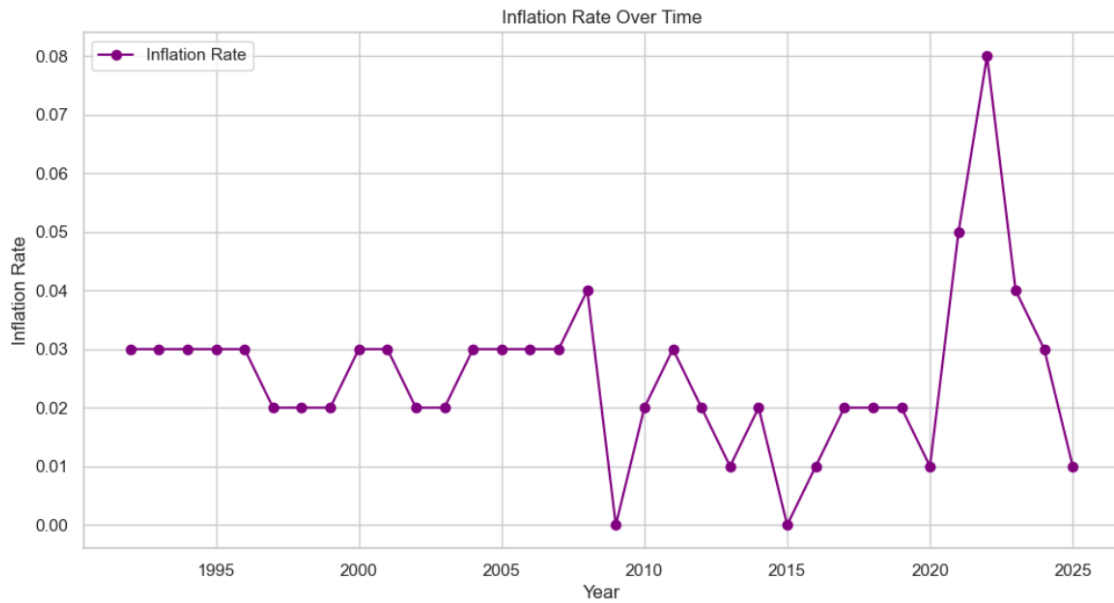
Trend Over Time:

- Imports and Exports have generally increased over time.
- Trade Balance remains negative, indicating a trade deficit over a long period of time.

Inflation Amount Scatterplot:



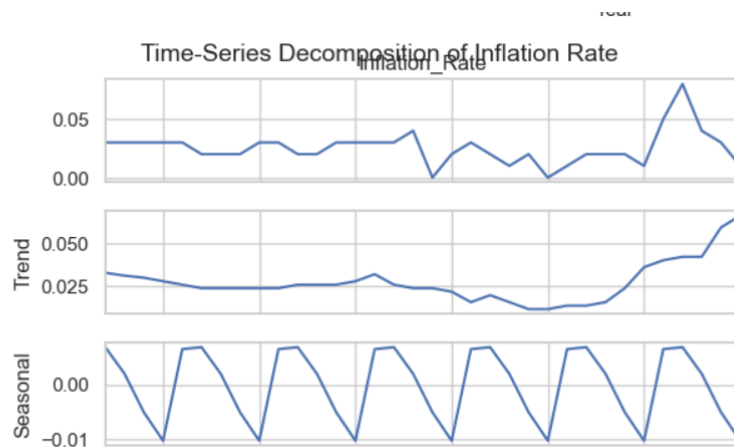
Inflation Rate Scatterplot:



Trend Analysis:

- The inflation rate has fluctuated over the years but generally remains between 0% and 8%.
- No clear upward or downward long-term trend is observed except for the COVID pandemic period around 2020-2023.

Decomposition Graphs:



Seasonal Decomposition:

- The trend component shows a smoother upward movement over time.
- The seasonal component suggests regular periodic fluctuations.

References

Inflation Dataset:

Webster, I. (2019). *\$1 in 1800 → 2019 | Inflation Calculator*. Officialdata.org.
<https://www.officialdata.org/us/inflation/1800?amount=1>

Imports, Exports and Trade Balances Dataset:

Division, U. C. B. F. T. (n.d.). *Foreign Trade: Data*. Www.census.gov.
<https://www.census.gov/foreign-trade/statistics/historical/index.html>