Data Collection and Preprocessing Phase

Date	15 March 2024
Team ID	740012
Project Title	**Predicting IMF-Based Exchange Rates: Leveraging Economic Indicators for Accurate Regression Modeling**
Maximum Marks	6 Marks

Data Exploration and Preprocessing Report

Dataset variables will be statistically analyzed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modeling, and forming a strong foundation for insights and predictions.

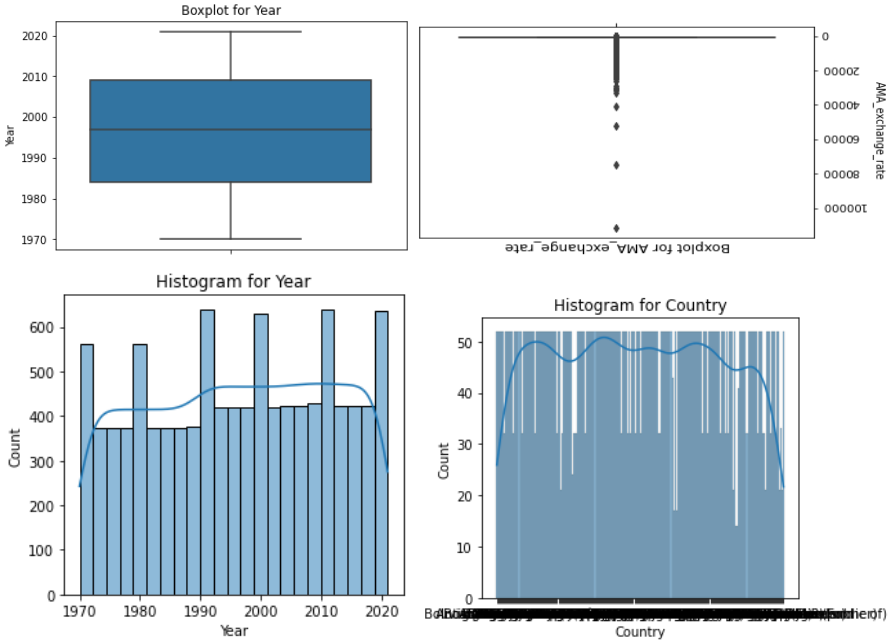
Section: Data Overview

Dimension:
614 rows × 13 columns

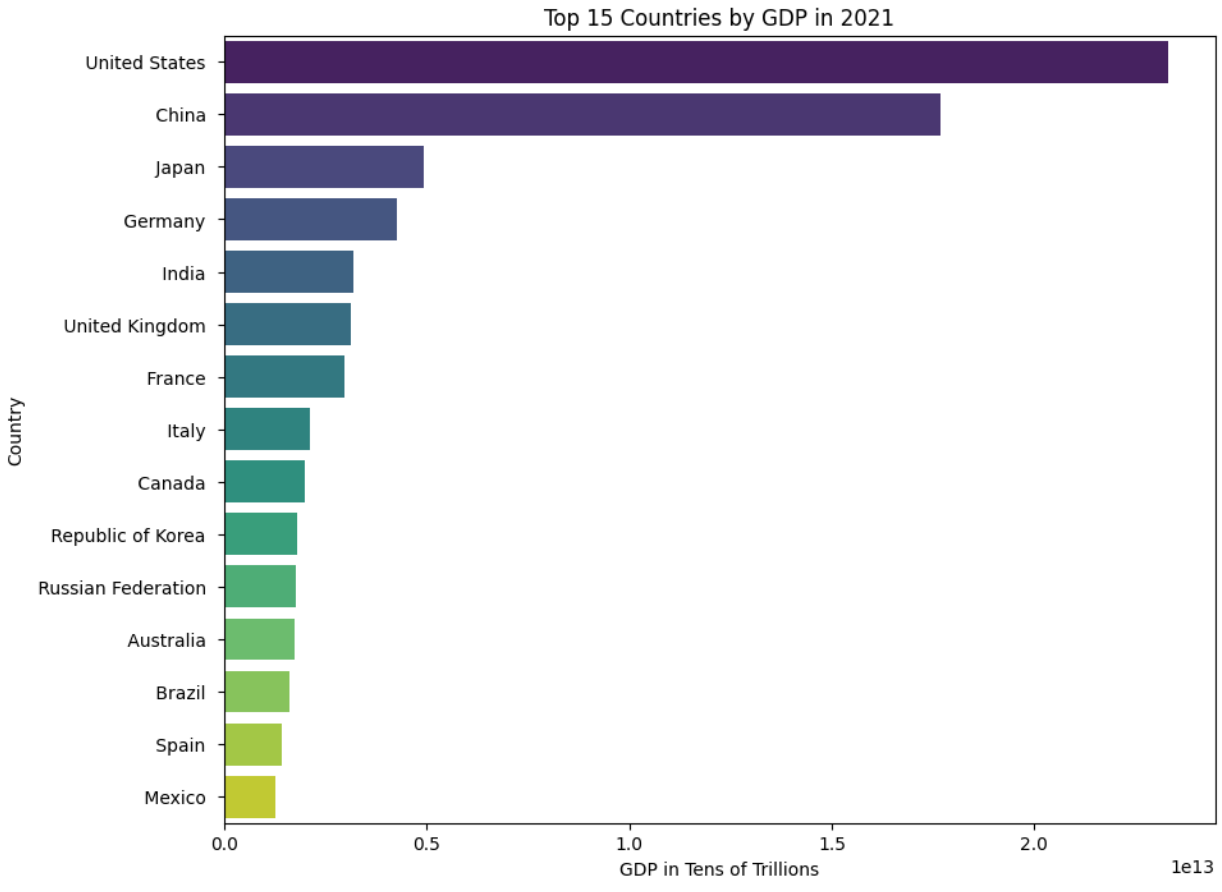
Descriptive statistics:

	Year	AMA_exchange_rate	IMF_exchange_rate	Population	Per capita GNI	(ISIC A-B)	Changes_i
count	10512.000000	1.051200e+04	1.051200e+04	1.051200e+04	10512.000000	1.051200e+04	
mean	1996.262747	3.573959e+02	3.419846e+02	2.851523e+07	8965.564593	7.793212e+09	
std	14.900361	2.291128e+03	1.941857e+03	1.141296e+08	17070.205895	4.011060e+10	
min	1970.000000	4.300000e-14	4.300000e-14	4.359000e+03	34.000000	2.813900e+04	-
25%	1984.000000	1.000000e+00	1.000000e+00	6.330615e+05	730.000000	1.336557e+08	
50%	1997.000000	2.812895e+00	2.761315e+00	5.051556e+06	2316.500000	9.569466e+08	
75%	2009.000000	5.134316e+01	4.806684e+01	1.678862e+07	8965.750000	4.213059e+09	
max	2021.000000	1.116366e+05	4.200000e+04	1.425893e+09	234317.000000	1.350000e+12	

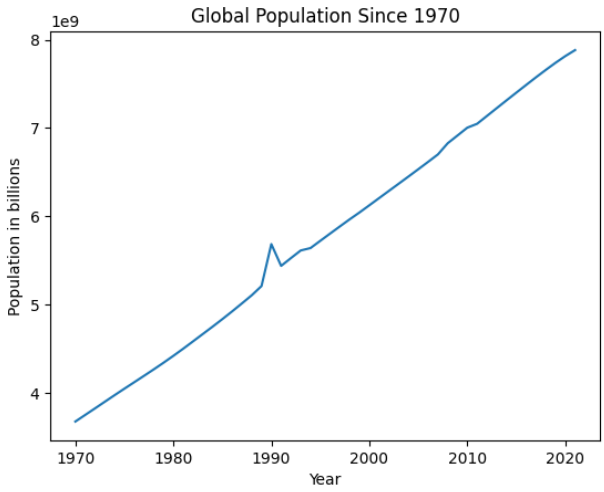
Section: Univariate Analysis



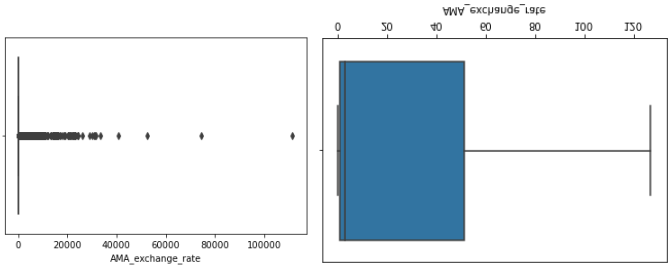
Bivariate Analysis



Multivariate Analysis



Outliers and Anomalies



Data Preprocessing Code Screenshots

Loading Data

Loading the dataset

```
data=pd.read_csv("Global Economy Indicators.csv")
```

```
data
```

	CountryID	Country	Year	AMA exchange rate	IMF based exchange rate	Population	Currency	Per capita GNI	Agriculture, hunting, forestry, fishing (ISIC A-B)	Changes in inventories
0	4	Afghanistan	1970	0.044998	0.044998	10752971	Afghani	164	8.699174e+08	NaN
1	4	Afghanistan	1971	0.044998	0.044998	11015857	Afghani	168	9.108281e+08	NaN
2	4	Afghanistan	1972	0.044998	0.044998	11286753	Afghani	149	8.279453e+08	NaN
3	4	Afghanistan	1973	0.044998	0.044998	11575305	Afghani	150	8.554869e+08	NaN

Handling Missing Data	# Handling missing values 14]: `data.isnull().sum()` 14]: Country 0 Year 0 AMA_exchange_rate 0 IMF_exchange_rate 0 Population 0 Currency 0 Per capita GNI 0 (ISIC A-B) 121 Changes_in_inventories 1841 (ISIC F) 0 Exports 21 Final_expenditure 0 Govt_expenditure 52 GCF 52 GFCF 52 HCE 52 Imports 42 (ISIC D) 43

Data Transformation	]:
	`data['(ISIC A-B)']=data['(ISIC A-B)'].fillna(data['(ISIC A-B)'].mean())`
	`data['Changes_in_inventories']=data['Changes_in_inventories'].fillna(data['Changes_in_inventories'].mean())`
	`data['Exports']=data['Exports'].fillna(data['Exports'].mean())`
	`data['Govt_expenditure']=data['Govt_expenditure'].fillna(data['Govt_expenditure'].mean())`
	`data['GCF']=data['GCF'].fillna(data['GCF'].mean())`
	`data['GFCF']=data['GFCF'].fillna(data['GFCF'].mean())`
	`data['HCE']=data['HCE'].fillna(data['HCE'].mean())`
	`data[ 'Imports']=data[ 'Imports'].fillna(data[ 'Imports'].mean())`
	`data['(ISIC D)']=data['(ISIC D)'].fillna(data[ '(ISIC D)'].mean())`
	`data[ '(ISIC I)']=data['(ISIC I)'].fillna(data[ '(ISIC I)'].mean())`
	`data[ '(ISIC G-H)']=data[ '(ISIC G-H)'].fillna(data[ '(ISIC G-H)'].mean())`

Feature Engineering	Attached the codes in final submission
Save Processed Data	