SOYBEAN OIL PRODUCTION IN ASIAN COUNTRIES

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INTRODUCTION

- Soybean oil is a vegetable oil extracted from the seeds of the soybean.

- As a drying oil, processed soybean oil is also used as a base for printing inks (soy ink) and oil paints.

INTRODUCTION

HISTORY

Chinese records dating prior to 2000 BCE mention use of cultivated soybeans to produce edible soy oil.

Ancient Chinese literature reveals that soybeans were extensively cultivated and highly valued as a use for the soybean oil production process before written records were kept.

INTRODUCTION

To produce soybean oil, the soybeans are cracked, adjusted for moisture content, heated to between 60 and 88 °C (140–190 °F), rolled into flakes, and solvent-extracted with hexanes.

PRODUCTION

- The oil is then refined, blended for different applications, and sometimes hydrogenated.
- Soybean oils, both liquid and partially hydrogenated are sold as "vegetable oil" or are ingredients in a wide variety of processed foods. Most of the remaining residue (soybean meal) is used as animal feed.

APPLICATIONS

FOOD

Soybean oil is mostly used for **frying** and **baking**. It is also used as a condiment for salads.

DRYING OILS

As a **drying oil**, processed soybean oil is used as a base for printing inks (soy ink) and soybean oil is also used in oil paints.

MEDICAL USES

Soybean oil is indicated for parenteral nutrition as a source of calories and essential fatty acids like **Omega-3**.

OBJECTIVE

- **To find the basic statistics of Soybean production, in Asian Countries from 1980-2021.**
- **To Forecast Soybean oil Production for 2022-2025 in Asian Countries.**
- **To Find Major soybean oil-producing Countries in Asian countries.**

Methodology

1.Data of Asian Countries - India, South Korea, Japan, China, Malaysia for soybean oil Production data from 1980-2021

2.Source of the data: https://www.indexmundi.com/

3.R Programming (R Studio)

4.Descriptive Statistics

5.Time series Plot - Histogram

6.I have Forecasted Production for years 2022-2025 using linear Regression

7.At last I have found which country contributes how much in soybean oil production and Which country is major producer of soybean oil - using Bar plot in R.

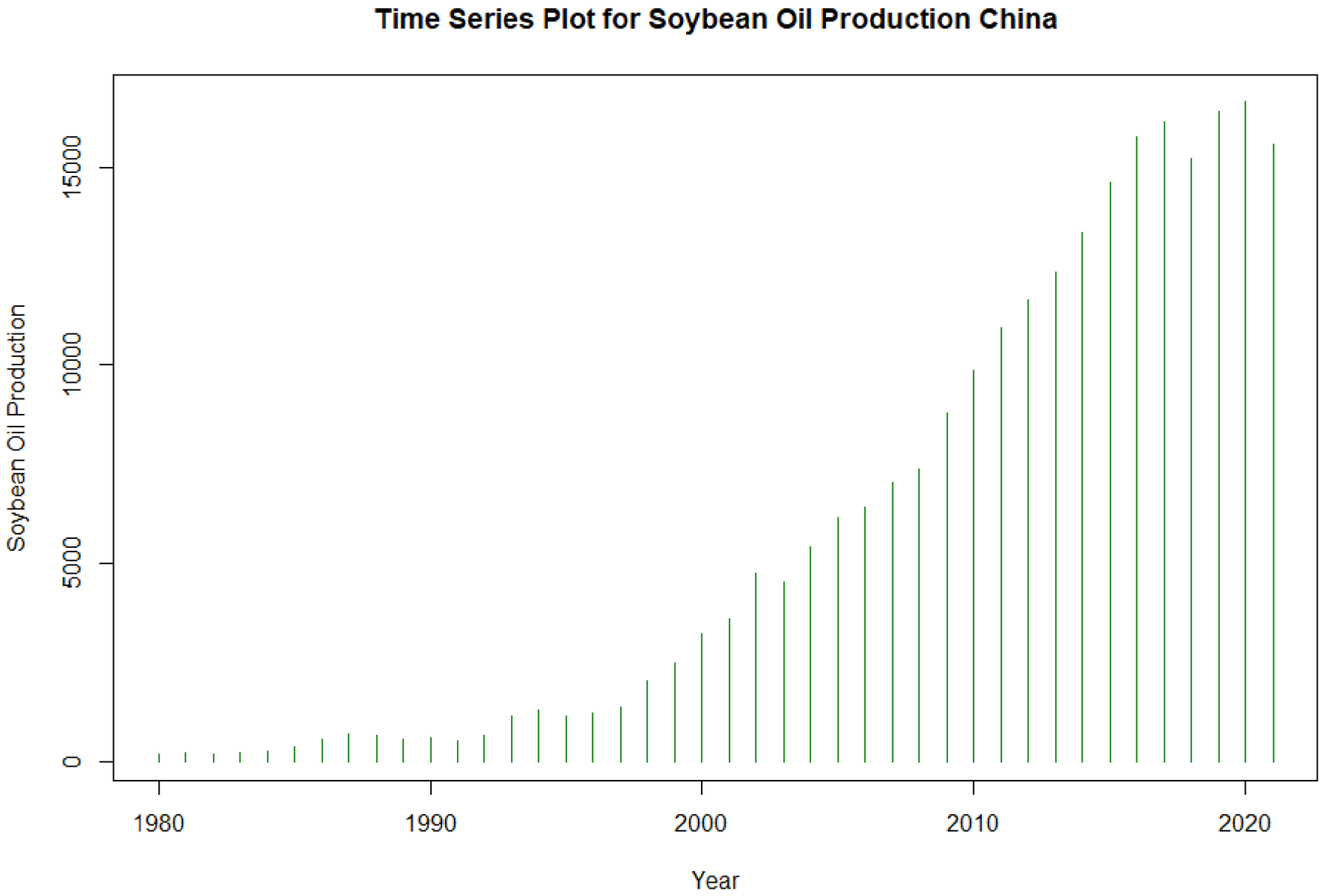
DESCRIPTIVE STATISTICS

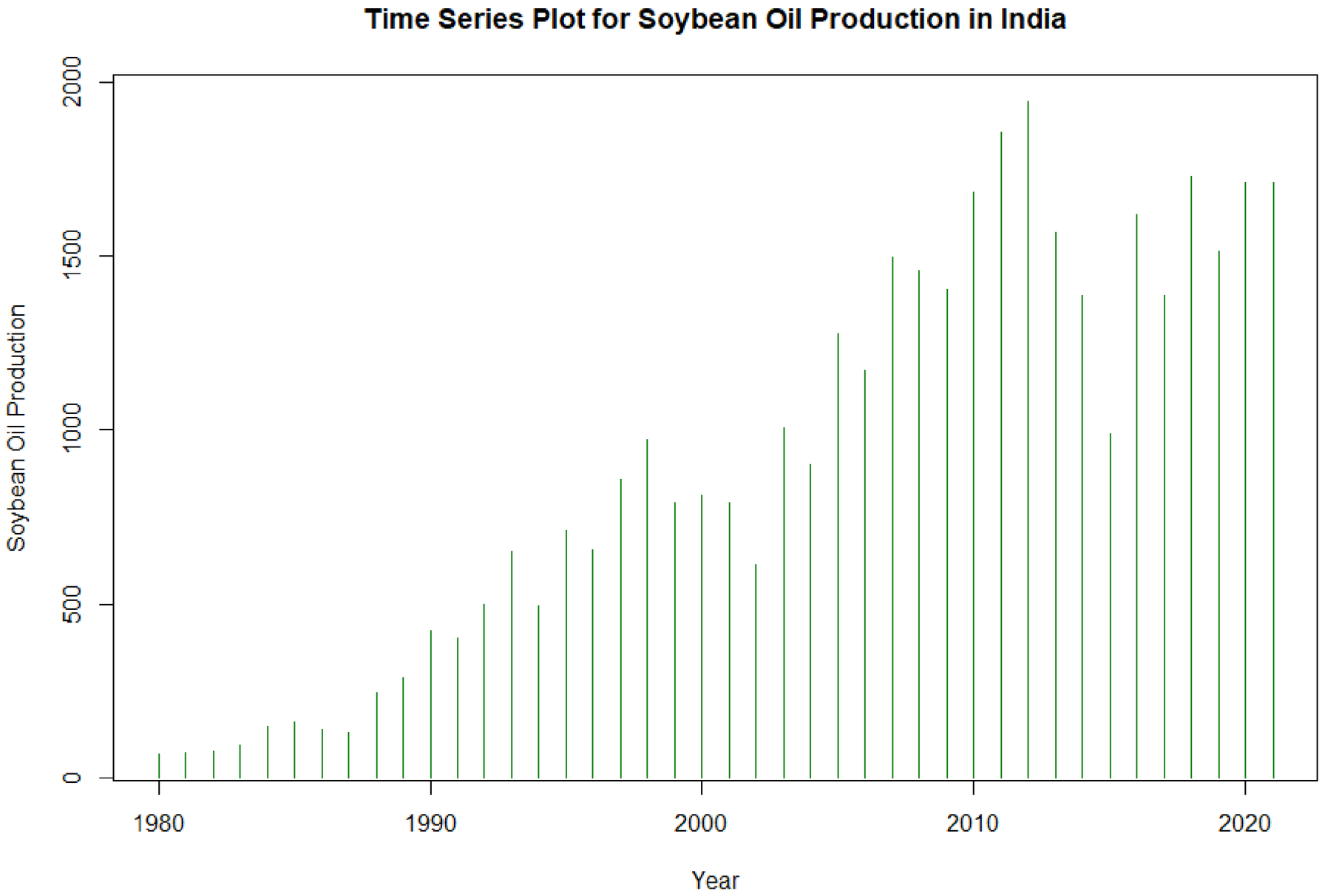
- SUM
- MEAN
- MEDIAN
- MINIMA
- MAXIMA
- STANDARD DEVIATION
- VARIANCE
- RANGE
- QUANTILE
- SKEWNESS
- KURTOSIS

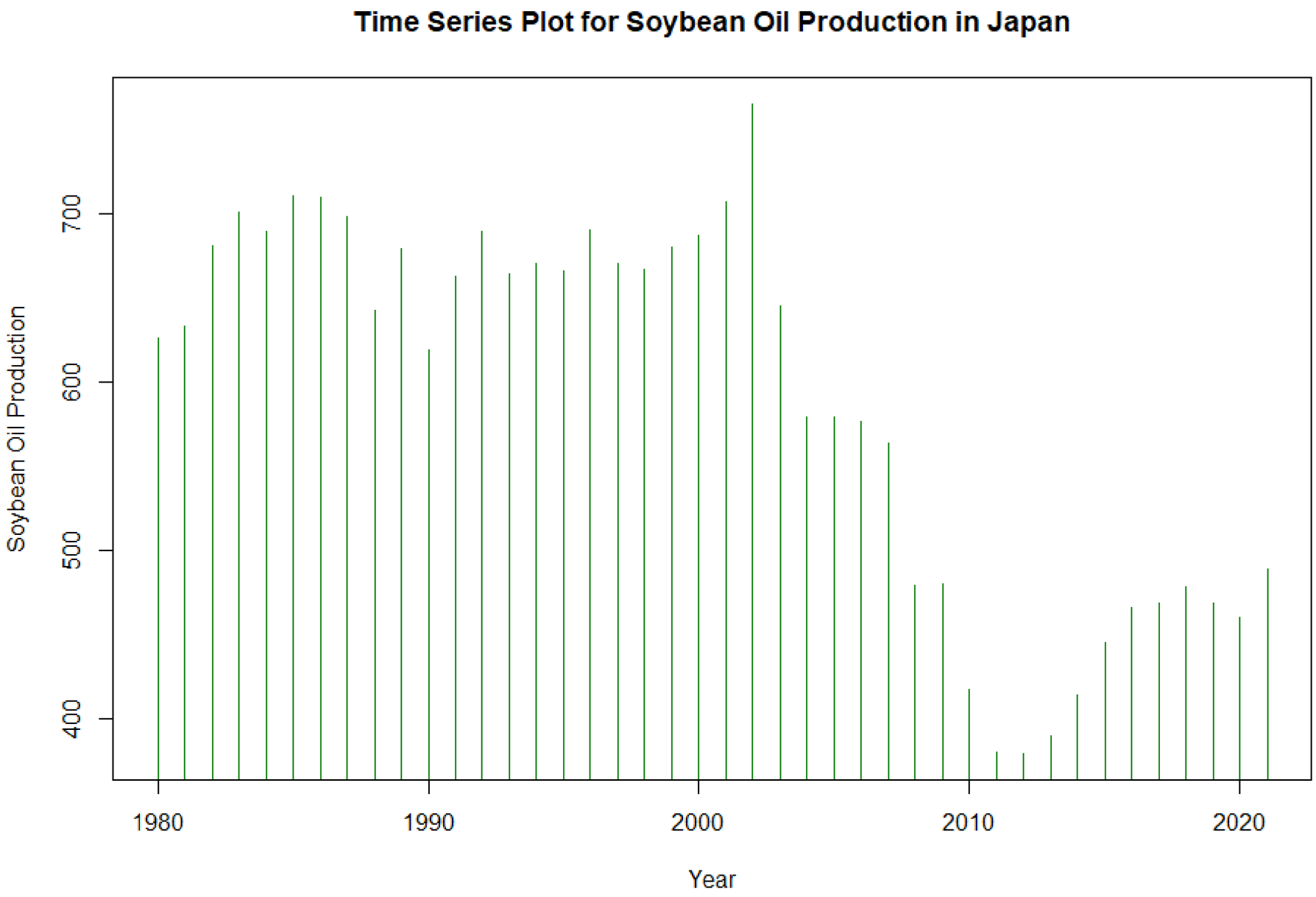
SUMMARY OF DESCRIPTIVE STATISTICS FOR ALL COUNTRIES

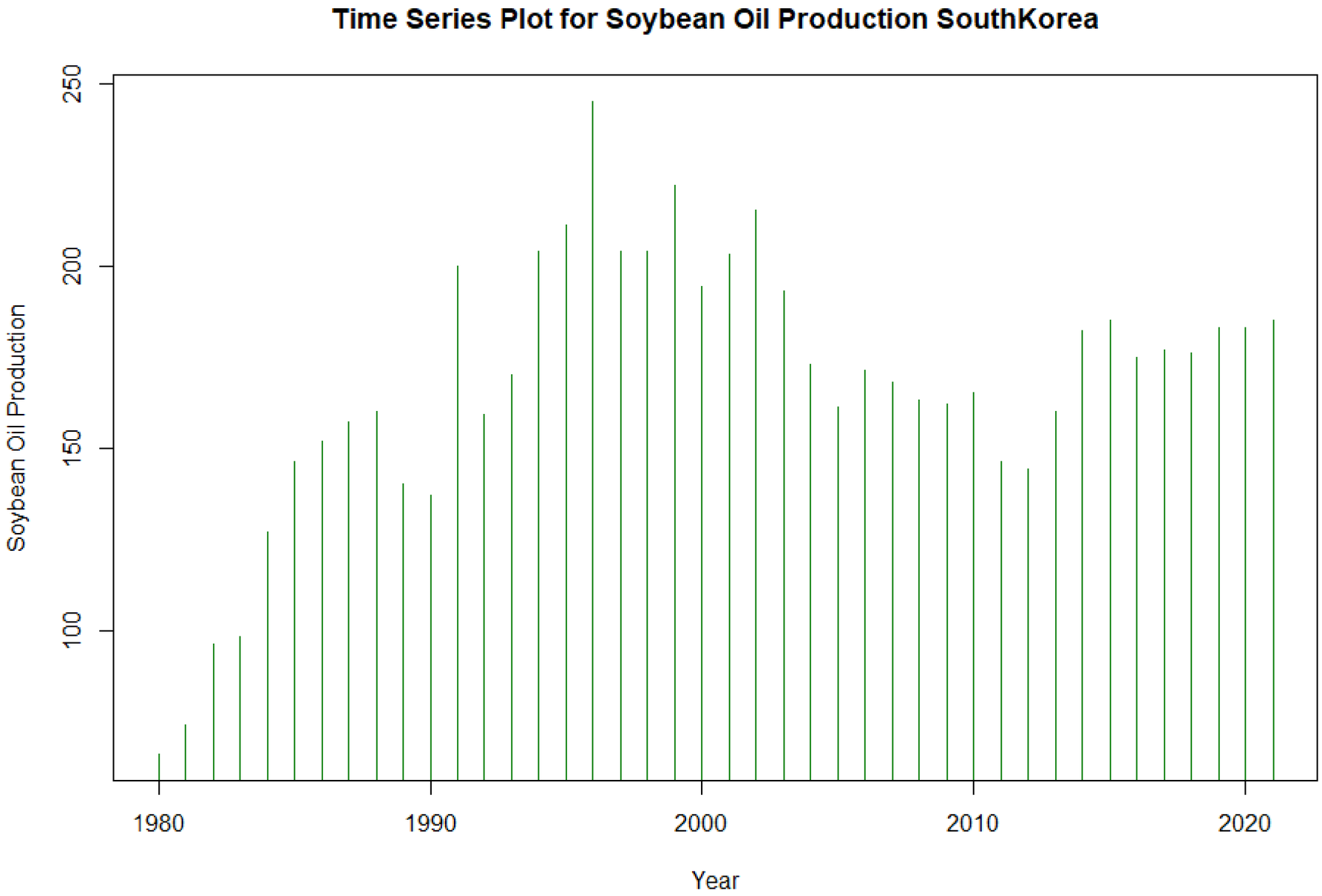
Descriptive Statistics							
	Sum	**Mean**	**Median**	**Minimum**	**Maximum**	**Standard Deviation**	**Variance**
China Soybean Oil Production	242126	5764.905	3407.5	183	16666	5858.887	34326552
India Soybean Oil Production	37910	902.619	834.5	69	1944	593.1944	351879.6
Japan Soybean Oil Production	24757	589.4524	637.5	379	765	113.328	12843.23
South Korea Soybean Oil Production	7036	167.5238	170.5	66	245	37.21607	1385.036
Malaysia Soybean Oil Production	2869	68.30952	71	19	109	22.78477	519.1458

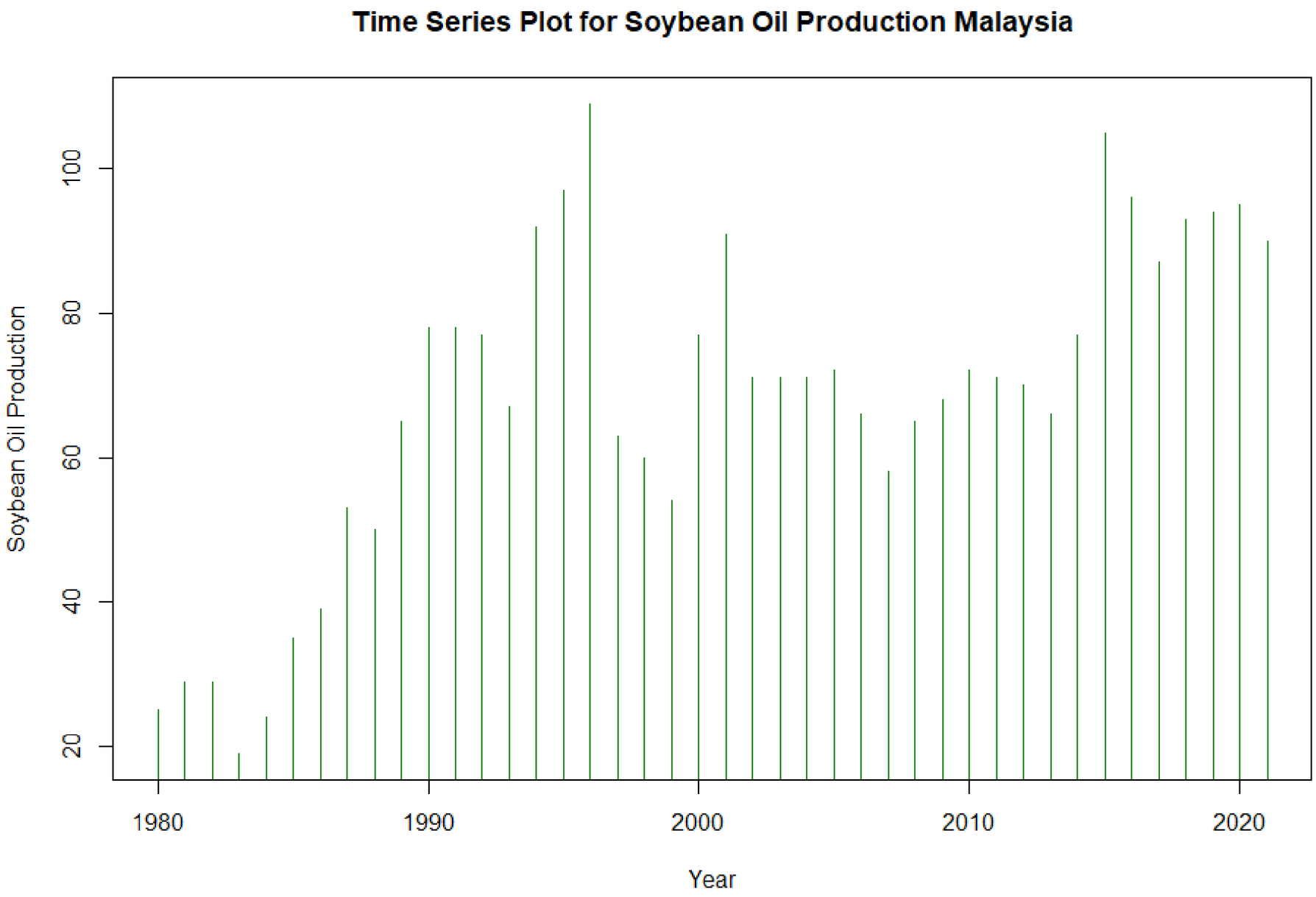
Descriptive Statistics						
	Range	**Quantile**			**Skewness**	**Kurtosis**
		25%	**50%**	**75%**		
China Soybean Oil Production	16483	660.25	3407.5	10662.25	0.7004563	1.960228
India Soybean Oil Production	1875	406.25	834.5	1444.5	0.1003482	1.688253
Japan Soybean Oil Production	386	478.25	637.5	680.75	-0.514172	1.809609
South Korea Soybean Oil Production	179	153.25	170.5	191	-0.777461	3.907424
Malaysia Soybean Oil Production	90	58.5	71	84.75	-0.47583	2.628037


Time Series Plot for Soybean Oil Production China
Soybean Oil Production
0
5000
10000
15000
1980
1990
2000
2010
2020
Year


Time Series Plot for Soybean Oil Production in India
Soybean Oil Production
0
500
1000
1500
2000
1980
1990
2000
2010
2020
Year


Time Series Plot for Soybean Oil Production in Japan
Soybean Oil Production
400
500
600
700
1980
1990
2000
2010
2020
Year


Time Series Plot for Soybean Oil Production SouthKorea
Soybean Oil Production
100
150
200
250
1980
1990
2000
2010
2020
Year


Time Series Plot for Soybean Oil Production Malaysia
Soybean Oil Production
20
40
60
80
100
1980
1990
2000
2010
2020
Year

LINEAR REGRESSION MODEL

A linear model is an equation that describes a **relationship between two quantities** that show a constant rate of change.

We **represent** linear relationships graphically with **straight lines**.

A **linear model** is usually described by **two parameters**:
- The **slope**, often called the **growth factor** or rate of change.
- The **y-intercept**, often called the **initial value**.

Given the slope ‘a’ and the y-intercept ‘b’,
the linear model can be written as a linear function
y = ax + b.

And **y** is the **dependent** or response variable and
x is the **independent** or predictor variable.

LINEAR REGRESSION- SOYBEAN OIL PRODUCTION FOR ASIAN COUNTRIES

·The linear regression for China

Y = -893513.7 + 449.5X

·The linear regression for India

Y = -90256.38 + 45.57X

·The linear regression for Japan

Y = 15397.626 -7.402X

·The linear regression for South Korea

Y = -2567.784 + 1.367X

·The linear regression for Malaysia

Y= -2508.625 + 1.288X

FORECASTED PRODUCTION FOR YEARS 2022-2025 USING LINEAR REGRESSION

CHINA

Soybean oil Production for Year (2017-2021) = (16128, 15232, 16397, 16666, 15590)

The forecasted Soybean oil production of China for Year 2022
The linear regression for china
Y = -893513.7 + (449.5*2022)
Y = 15375.3

Forecasted Value of production for the Year 2022 =15,375(1000MT)
And For Years (2023,2024,2025) = (15824, 16274 16723)

Actual Value of Production for Year 2022 = 17,203 (1000 MT)

FORECASTED PRODUCTION FOR YEARS 2022-2025 USING LINEAR REGRESSION

INDIA

Soybean oil Production for Year (2017-2021) = 1386,1728,1512,1710,1710

The forecasted Soybean oil production of India for Year 2022
The linear regression for India
Y = -90256.38 + (45.57*2022)
Y = 1886.16

Forecasted Value of production for the Year 2022 =1886(1000MT)
And For Years (2023,2024,2025) = (1931, 1977, 2022)

Actual Value of Production for Year 2022 = 1800 (1000 MT)

FORECASTED PRODUCTION FOR YEARS 2022-2025 USING LINEAR REGRESSION

JAPAN

Soybean oil Production for Year (2017-2021) = 468, 478, 468, 460, 488

The forecasted Soybean oil production of Japan for Year 2022
The linear regression for Japan
Y = 15397.626 + (-7.402*2022)

Y = 430.782
Forecasted Value of production for the Year 2022 = 430(1000MT)
And For Years (2023,2024,2025) = (423,415,408)

Actual Value of Production for Year 2022 = 488 (1000 MT)

FORECASTED PRODUCTION FOR YEARS 2022-2025 USING LINEAR REGRESSION

SOUTH KOREA

Soybean oil Production for Year (2017-2021) = 177,176,183,183,185

The forecasted Soybean oil production of South Korea for Year 2022
The linear regression for South Korea
Y = -2567.784 + (1.3672*2022)
Y = 196.6944

Forecasted Value of production for the Year 2022 = 196 (1000MT)
And For Years (2023,2024,2025) =(198,199,200)

Actual Value of Production for Year 2022 = 190 (1000 MT)

FORECASTED PRODUCTION FOR YEARS 2022-2025 USING LINEAR REGRESSION

MALAYSIA

Soybean oil Production for Year (2017-2021) = 87,93,94,95,90

The forecasted Soybean oil production of Malaysia for Year 2022

The linear regression for Malaysia

Y= -2508.625 + (1.288*2022)

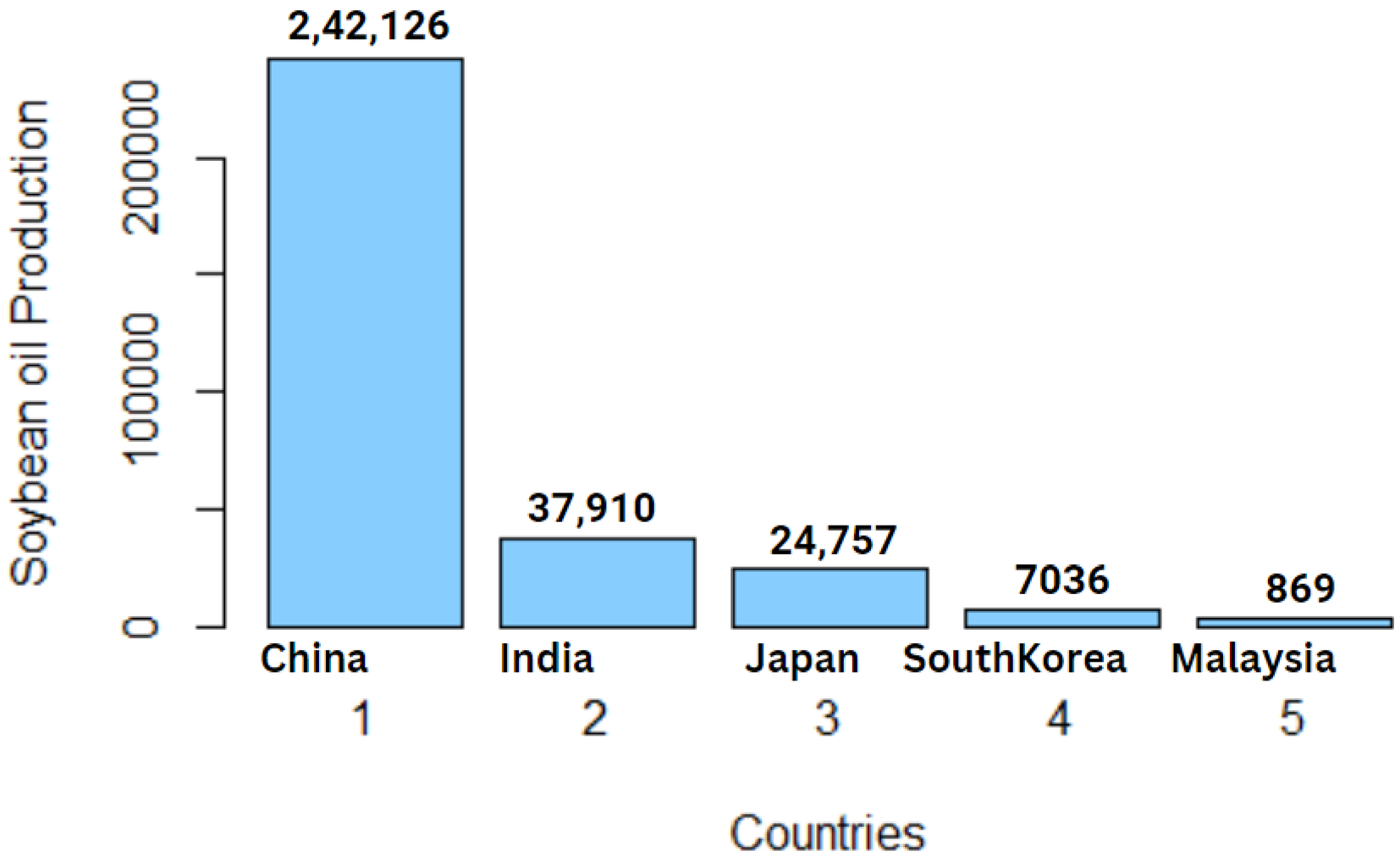
Y = 95.711

Forecasted Value of production for the Year 2022 = 95 (1000MT)

And For Years (2023,2024,2025) = (96,98,99)

Actual Value of Production for Year 2022 = 98 (1000 MT)

Bar plot of Total Soybean Oil Production of Asian Countries from 1980-2021



THANK YOU!