Name:	Khushi Bharat Jain
UID:	2021700030
Experiment:	9

Design Big Data Dashboards using Tableau on Women Empowerment/Gender Participation Dataset

Aim

To design and develop interactive Big Data dashboards in Tableau using the dataset on Women Empowerment and Gender Participation. This project focuses on creating visualizations that represent various facets of gender participation, using basic and advanced charts to derive insights.

Objectives

1. Develop a Tableau dashboard that visualizes different aspects of women empowerment and gender participation.
2. Create basic charts (Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, Bubble plot) to represent fundamental data distributions and relationships.
3. Design advanced charts (Word chart, Box and Whisker plot, Violin plot, Regression plot, 3D chart, Jitter) to analyze complex relationships and distributions.
4. Derive insights and observations from each visualization to better understand patterns and trends within the dataset.
5. Document a comprehensive analysis with observations for each chart and suggest potential areas for further research or application.
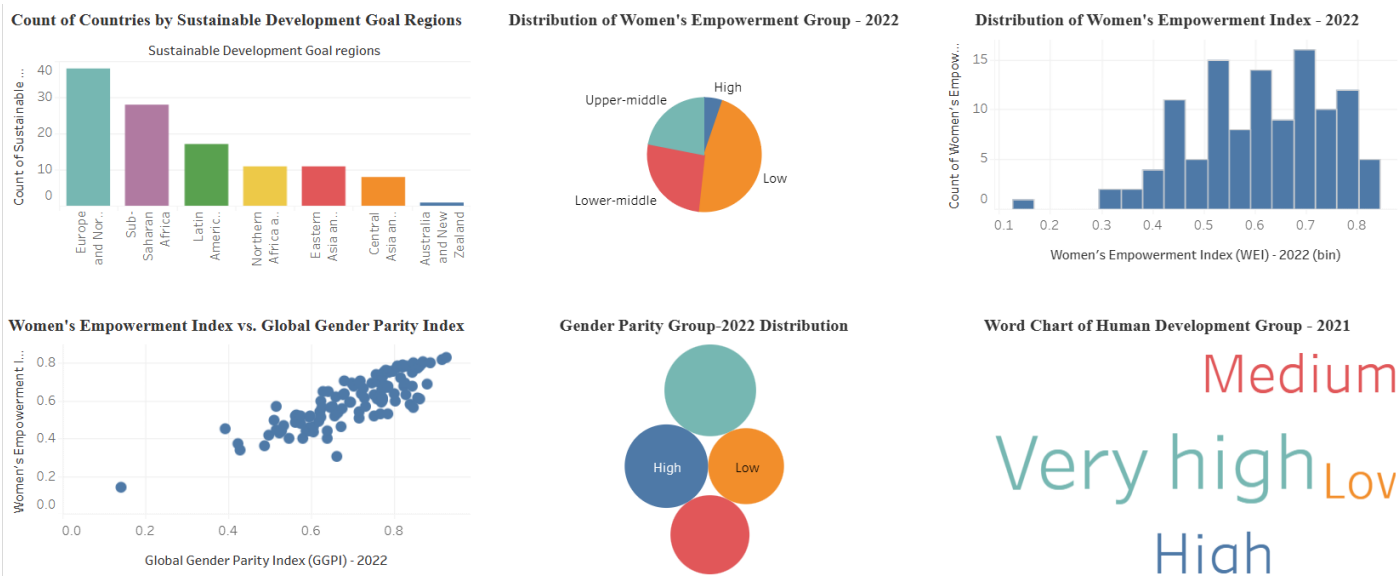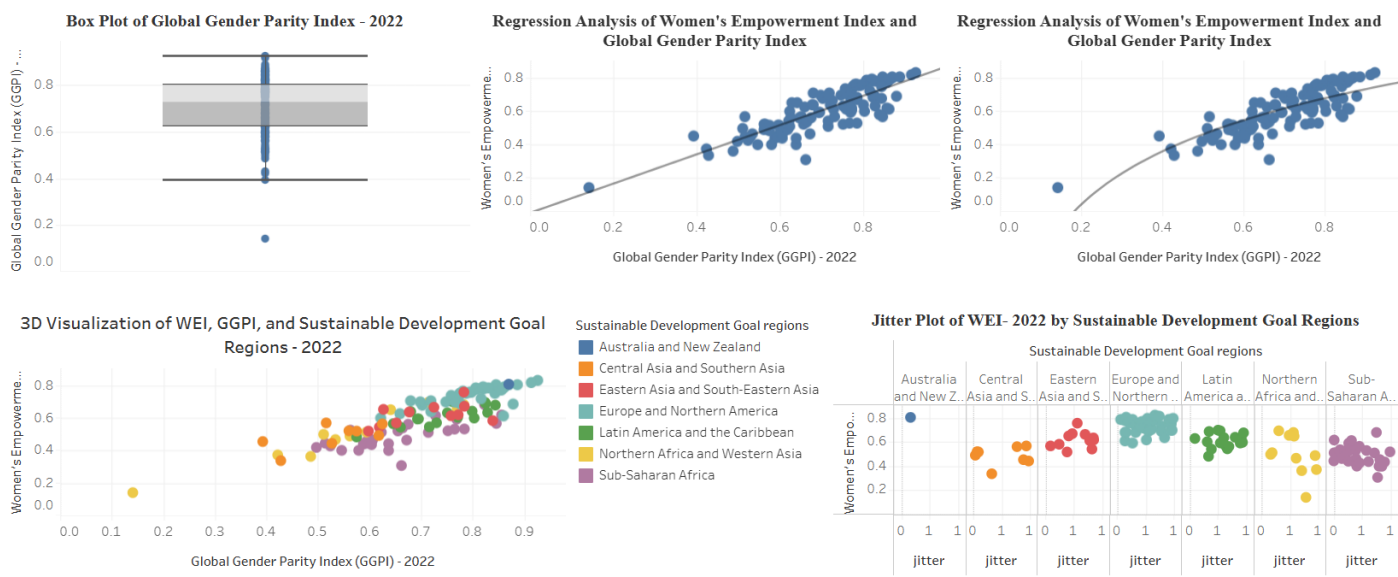
DATASET LINK:

https://www.kaggle.com/datasets/iamsouravbanerjee/women-empowerment-index

TABLEAU PUBLIC LINK:

https://public.tableau.com/app/profile/khushi.jain4331/viz/khushi_adv9/Story1

DASHBOARD 1:

Count of Countries by Sustainable Development Goal Regions

Sustainable Development Goal regions

Distribution of Women's Empowerment Group - 2022

- High
- Upper-middle
- Lower-middle
- Low

Distribution of Women's Empowerment Index - 2022

Women's Empowerment Index vs. Global Gender Parity Index

Gender Parity Group-2022 Distribution

- High
- Low

Word Chart of Human Development Group - 2021

Medium
Very high Low
High

DASHBOARD 2:

Box Plot of Global Gender Parity Index - 2022

Regression Analysis of Women's Empowerment Index and Global Gender Parity Index

Regression Analysis of Women's Empowerment Index and Global Gender Parity Index

3D Visualization of WEI, GGPI, and Sustainable Development Goal Regions - 2022

Sustainable Development Goal regions
- Australia and New Zealand
- Central Asia and Southern Asia
- Eastern Asia and South-Eastern Asia
- Europe and Northern America
- Latin America and the Caribbean
- Northern Africa and Western Asia
- Sub-Saharan Africa

Jitter Plot of WEI- 2022 by Sustainable Development Goal Regions

Sustainable Development Goal regions

ANALYSIS:

Bar Chart:

Count of Countries by Sustainable Development Goal Regions

Sustainable Development Goal regions
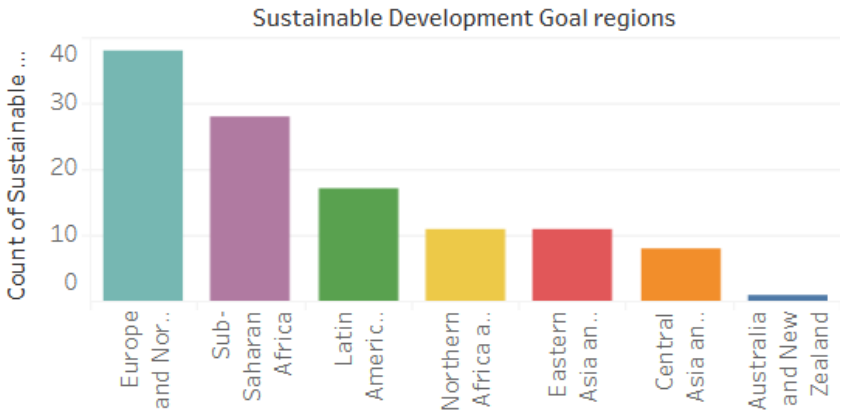
The chart indicates that Europe and Northern America have the highest number of countries focused on achieving SDGs, followed by Sub-Saharan Africa. This may reflect regional differences in focus, resources, and progress towards sustainable development.

Pie Chart:

Distribution of Women's Empowerment Group - 2022
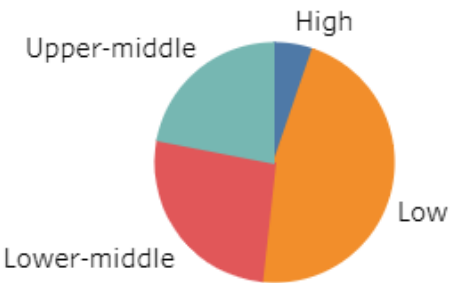
Most countries fall within the "Low" and "Lower-middle" women's empowerment categories. This suggests that many countries need to make efforts in improving women's empowerment.

Histogram:

Distribution of Women's Empowerment Index - 2022
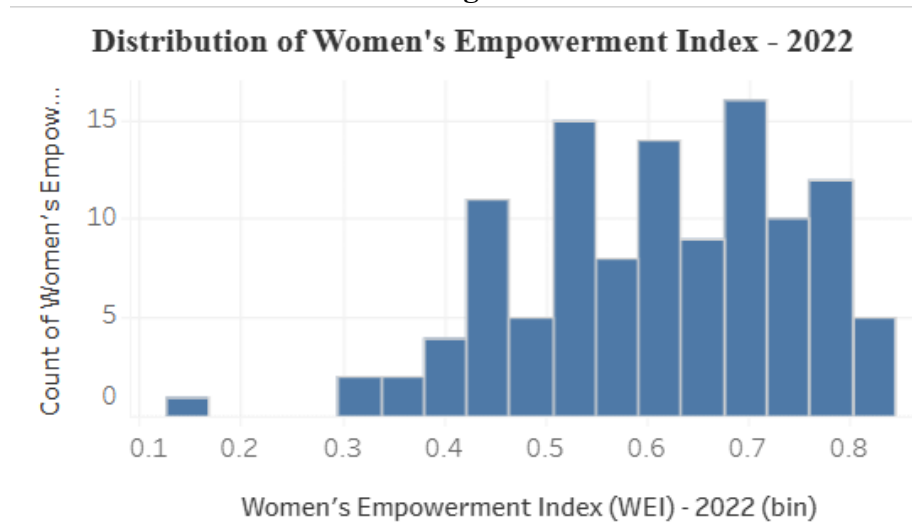
The histogram is right-skewed, indicating that a significant number of countries have relatively high WEI scores. This supports the idea that women's empowerment is advancing globally, but there is still a small group of countries with low WEI scores that may need more support.

Scatter Plot:

Women's Empowerment Index vs. Global Gender Parity Index
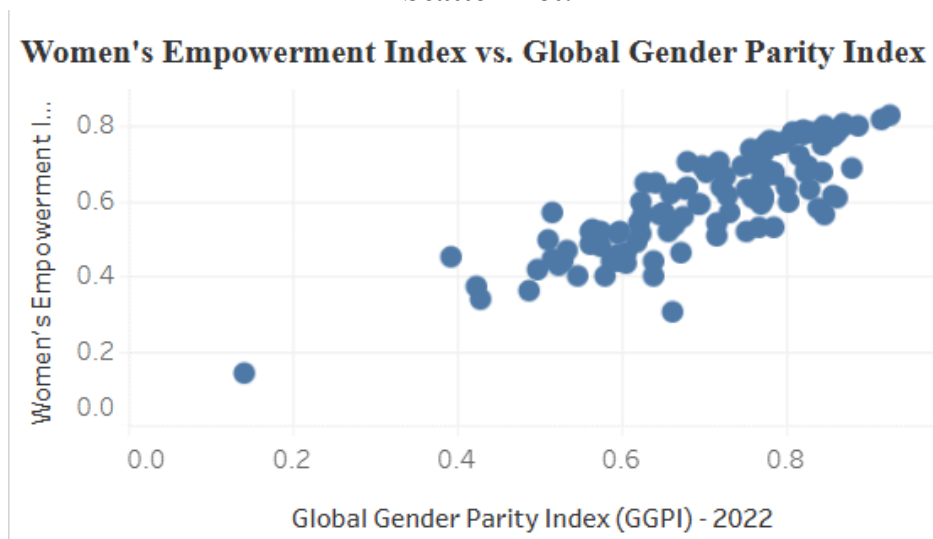
There appears to be a positive correlation, where countries with higher women's empowerment levels tend to also have higher gender parity. This correlation suggests that efforts to empower women may align with efforts to improve gender parity overall.

Bubble Plot:

Gender Parity Group-2022 Distribution
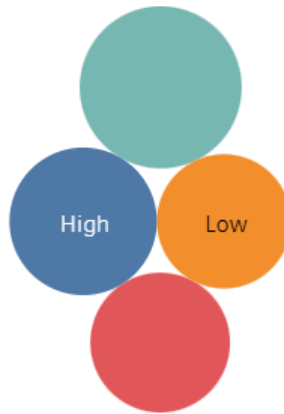
Most countries fall under the "High" and "Low" gender parity groups, indicating diverse levels of gender parity globally. This variance may result from different cultural, social, and economic factors impacting gender parity.

Word Chart:

**Word Chart of Human Development Group - 2021**

The word cloud highlights "Very high" and "High" as the most common human development groups, reflecting that many countries have high development levels. However, the presence of "Medium" and "Low" indicates a disparity that still exists in human development across regions.

Box Plot:

Box Plot of Global Gender Parity Index – 2022
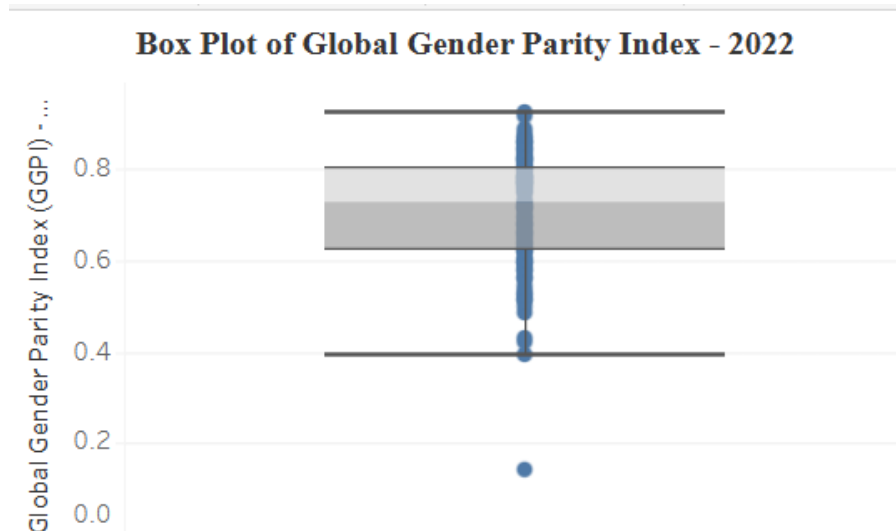
The box plot shows a concentration of GGPI scores around the median, with a few outliers on the lower end. This suggests that while most countries have achieved a certain level of gender parity, there are a few lagging significantly behind, highlighting a disparity in gender parity progress globally.

Linear Regression Plot:

Regression Analysis of Women's Empowerment Index and Global Gender Parity Index
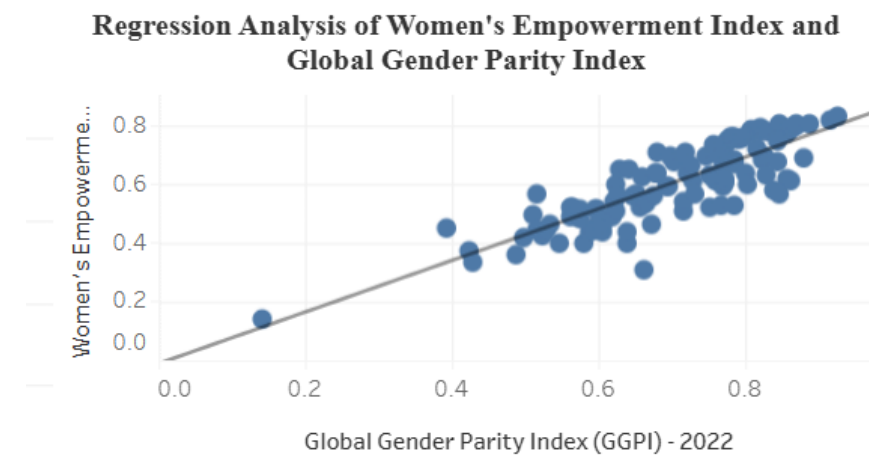
This indicates a positive relationship between WEI and GGPI, implying that countries with higher women's empowerment levels tend to also have higher gender parity.

Non Linear Regression Plot:
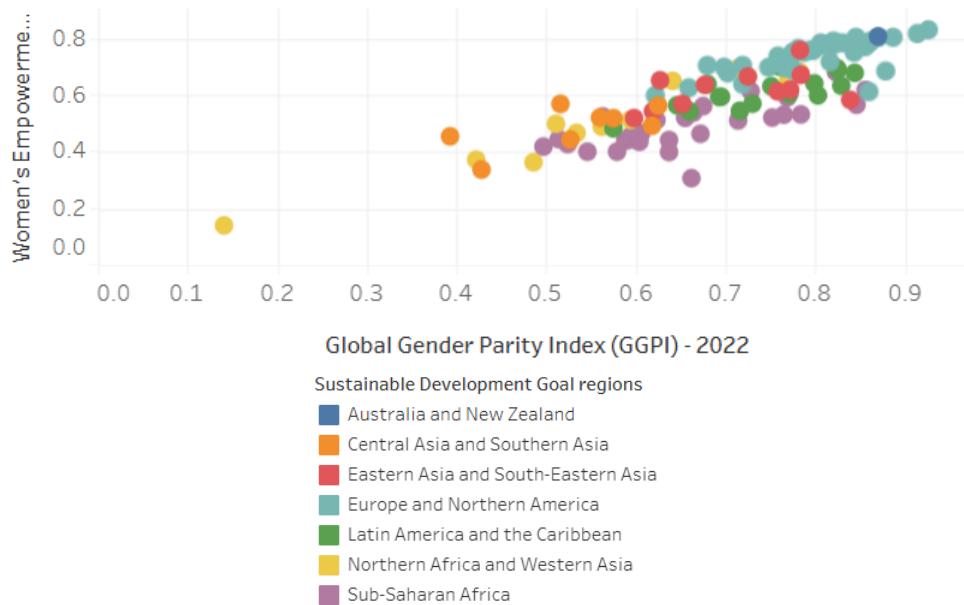

Regression Analysis of Women's Empowerment Index and Global Gender Parity Index
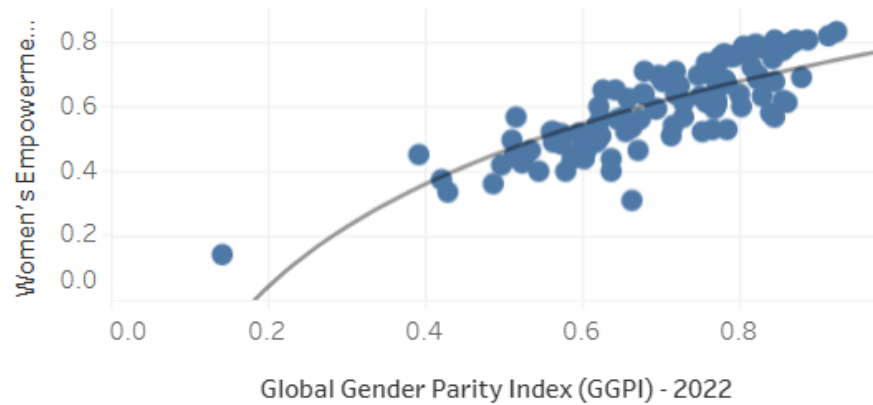
The nonlinear model captures a more nuanced pattern, possibly indicating that increases in gender parity become more gradual as empowerment levels reach higher values.

3D Chart:

3D Visualization of WEI, GGPI, and Sustainable Development Goal Regions - 2022

Different regions show varied clusters in terms of WEI and GGPI values, with Europe and Northern America typically showing higher scores for both indices. Sub-Saharan Africa and other developing regions may show a wider spread, emphasizing regional disparities in achieving gender parity and empowerment goals.

Jitter Plot:

Jitter Plot of WEI- 2022 by Sustainable Development Goal Regions
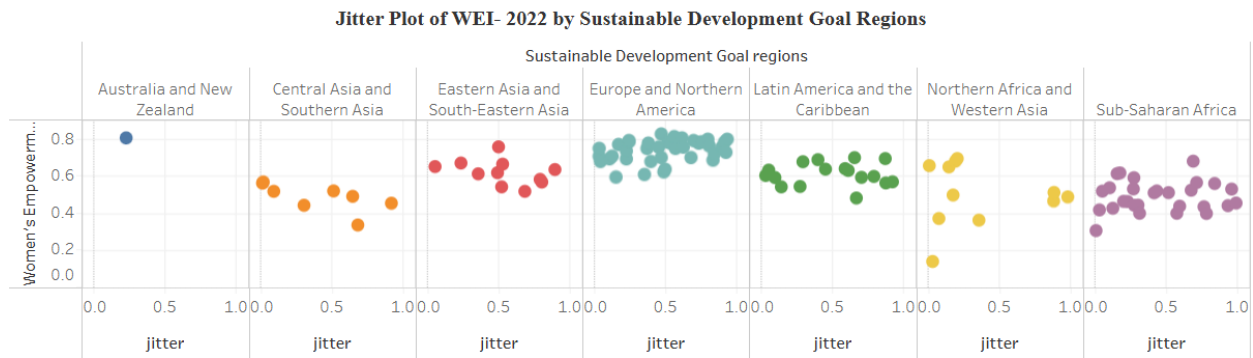
The jitter plot reveals that regions like Europe and Northern America generally have higher WEI scores, while regions like Sub-Saharan Africa exhibit a broader range with some lower scores. This visualization highlights the diversity within and across regions in terms of women's empowerment levels, with certain regions still facing significant challenges.

Conclusion

This lab demonstrates how Big Data visualizations can be designed to gain insights into gender participation and women empowerment. Tableau's capabilities allow for interactive and visually rich dashboards, making it easier to analyze large datasets and identify trends or gaps. The visualizations offer a valuable perspective for decision-makers to understand the effectiveness of empowerment programs.