Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY

Advanced Data Visualization
Experiment no. 9

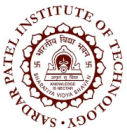### Submitted To

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Submitted By

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Batch: BE Comps (Batch B)

1. 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.

2. Procedure Description:

Step-1: Dataset:

You can view the dataset from this link.

Step-2: Description:

Overview: This dataset is used to create dashboards that illustrate gender participation and women empowerment across various dimensions. It contains data points related to participation levels, empowerment scores, and other demographic indicators. The purpose is to analyze the trends, disparities, and potential impacts of empowerment initiatives.

Attributes in the Dataset:

- **Country**: The country from which the data has been sourced.
- **Year**: The year the data was recorded, allowing analysis over time.
- **Empowerment Score**: A numerical measure that reflects the level of women empowerment in a given region.
- **Participation Level**: The extent to which women are participating in various sectors (e.g., education, workforce, politics).
- **Sector/Field**: Areas of participation, such as healthcare, education, technical fields, etc.
- **Population Count**: The number of women represented by the dataset in a particular region.
- **Demographic Indicators**: Information such as age group, education level, or economic status that may affect empowerment or participation.

Key Metrics for Analysis:

- Total and average participation levels across countries and sectors.
- Distribution of empowerment scores to understand the overall state and variance.
- Trends in participation and empowerment over time.

- Correlations between different indicators, such as age and empowerment.

1. Stacked Bar Plot of WEI and GGPI by Region

Observation:

- This plot shows the distribution of the **Women's Empowerment Index (WEI)** and the **Global Gender Parity Index (GGPI)** across different Sustainable Development Goal (SDG) regions.
- Regions such as **Europe and Northern America** have higher values for both WEI and GGPI, while regions like **Sub-Saharan Africa** show relatively lower values.

Analysis:

- The differences across regions highlight global disparities in gender equality and women's empowerment.
- Regions with higher scores for WEI and GGPI indicate better gender parity and more supportive environments for women's empowerment.
- The plot suggests that development and gender equality indices are closely related, with developed regions generally scoring higher.

2. Pie Chart of Country Distribution by Sustainable Development Goal Region

Observation:

- This pie chart depicts the proportion of countries grouped by their respective **Sustainable Development Goal regions**.
- Larger sections indicate regions with a higher number of countries, such as **Sub-Saharan Africa** and **Eastern Asia and South-Eastern Asia**.

Analysis:

- This visualization helps understand which regions contribute the most to global measures of gender equality and women's empowerment.
- It shows the distribution of focus and regional diversity, which is essential for targeted policy actions and global comparisons.

3. Heatmap of Correlations Between All Metrics

Observation:

- The heatmap illustrates the strength and direction of correlations between different metrics, such as **Human Development Index (HDI)**, **WEI**, and **GGPI**.
- Darker shades indicate stronger positive correlations, while lighter shades show weaker or negative correlations.

Analysis:

- The positive correlations between **HDI** and both **WEI** and **GGPI** suggest that higher human development is associated with better gender equality and women's empowerment.
- This insight emphasizes that improvements in gender indices often align with overall human development progress.

4. Box Plot of WEI by Human Development Group

Observation:

- The box plot shows the distribution of the **Women's Empowerment Index** across different human development groups (e.g., high, medium, low, very high HDI).
- The spread of the data points indicates how women's empowerment varies by HDI classification.

Analysis:

- The plot reveals that **countries with a very high HDI** typically have higher WEI scores, indicating that women's empowerment is greater in more developed nations.
- Conversely, **low HDI groups** have a narrower range and lower median WEI values, signifying challenges in promoting gender equality in less developed regions.

5. Scatter Plot of WEI vs. GGPI

Observation:

- This scatter plot shows the relationship between the **Women's Empowerment Index (WEI)** and the **Global Gender Parity Index (GGPI)** for various countries or regions.
- A positive correlation is evident, where higher GGPI scores align with higher WEI scores.

Analysis:

- The plot suggests that gender parity is often accompanied by improvements in broader women's empowerment.
- Countries or regions above the trendline may indicate places where gender parity efforts translate particularly effectively into empowerment.

6. Bar Plot of Global Gender Parity Index (GGPI) by Region

Observation:

- This bar plot presents GGPI values categorized by **gender parity groups** (e.g., high, low, lower-middle, upper-middle).
- The highest GGPI values are seen in regions classified as "High," while lower groups have more modest GGPI values.

Analysis:

- The bar plot reinforces the observation that regions with stronger gender parity practices have better outcomes in gender-related indices.
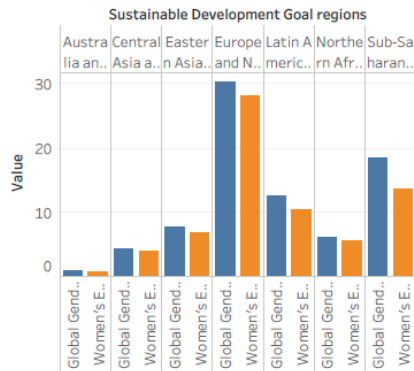- Regional variations highlight areas that may need targeted interventions to boost gender parity.

Overall Insights:

- **Strong Regional Variations**: Developed regions, such as Europe and Northern America, consistently show higher scores for both gender indices, reflecting advanced gender equality measures.
- **Correlations with HDI**: Higher development levels correlate with better gender parity and women's empowerment, suggesting a systemic relationship between overall human development and gender-focused metrics.
- **Potential Policy Focus**: Regions with lower GGPI and WEI scores, like **Sub-Saharan Africa** and **Central Asia**, could benefit from targeted programs to bridge gender equality gaps.

Recommendations for Further Analysis:

- **Deeper Analysis of Outliers**: Identifying countries that defy trends (high GGPI but lower WEI, or vice versa) could reveal unique social or policy factors.
- **Temporal Analysis**: Adding data over multiple years would show whether regions are improving, stagnating, or regressing in terms of gender parity and women's empowerment.
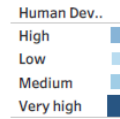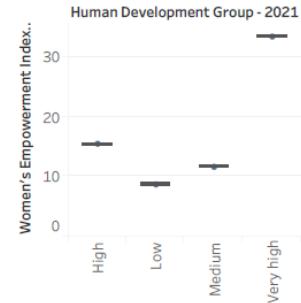
Stacked Bar Plot of WEI and GGPI by Region

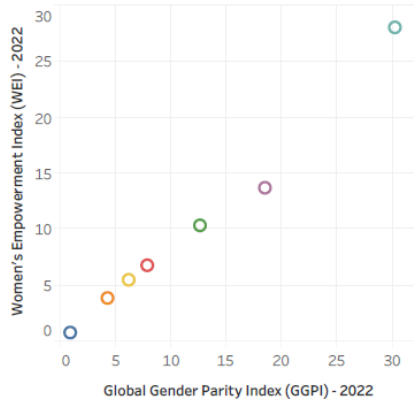## Pie Chart of Country Distribution by Sustainable Development Goal Region

Heatmap of Correlations between All Metrics

Human Dev..
- High
- Low
- Medium
- Very high

Box Plot of WEI by Human Development Group

Scatter Plot of WEI vs. GGPI

Bar Plot of Global Gender Parity Index (GGPI) by Region

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

Measure Names
- Global Gender Parity Index (GGPI) - 20..
- Women's Empowerment Index (WEI) - ..

Women's Empowerment Index (WEI) - 2022
8.70 — 33.41

Global Gender Parity Index (GGPI) - 2022
- 11.99
- 15.00
- 20.00
- 25.00
- 30.00
- 35.73