Assignment 3: Addressing Complexity

Seeshuraj Bhoopalan
Student Number: 24359927

Declaration

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at `http://www.tcd.ie/calendar`. I have also completed the Online Tutorial on avoiding plagiarism *Ready Steady Write*, located at `http://tcd-ie.libguides.com/plagiarism/ready-steady-write`.

Dataset Overview

Dataset: Renewable Energy Data (1965-2022)
Source: Public dataset combining multiple renewable energy indicators, including solar, wind, and hydropower energy production.

Description

The dataset captures renewable energy production and consumption trends globally from 1965 to 2022. It includes attributes such as energy production (in terawatt-hours), share of electricity from renewables, and regional contributions.

Attributes

- **Quantitative:** Energy production (TWh), share of electricity (%).
- **Categorical:** Country names and regions.
- **Temporal:** Year (1965-2022).

Tasks Supported

- **Trend Analysis:** Identify global growth in renewable energy production over time.
- **Comparison:** Compare contributions from different renewable sources.
- **Regional Insights:** Highlight leading regions or countries in renewable energy adoption.

Visualization Design

Encoding Channels and Idioms

- **Line Chart:** Displays global trends in renewable energy production from 1965 to 2022.
- **Interactive Visualization:** Enables dynamic exploration of regional contributions.
- **Encoding Choices:**
  - **Color:** Distinguishes energy types and regions.
  - **Position:** Aligns data chronologically along the x-axis.

Design Considerations

- **Accessibility:** Intuitive color schemes and clear legends.
- **Scalability:** Suitable for detailed analysis across decades.
- **Clarity:** Focuses on key trends without overplotting.

Novelty and Complexity

Novelty

The visualizations combine data from multiple renewable sources into a single framework, offering a holistic view of global trends. The interactivity adds depth by allowing users to explore regional and temporal variations.

Complexity

The dataset's multivariate and temporal nature necessitates integrating multiple encoding channels and idioms to effectively represent trends and comparisons.

Strengths and Weaknesses

Strengths

- Comprehensive overview of renewable energy trends globally.
- Supports dynamic interactivity for deeper exploration.
- Highlights regional and temporal contributions effectively.

Weaknesses

- Static format limits exploration in certain views.
- Limited granularity for individual country analysis in static visualizations.

Artifacts

- **Static Visualization:** A PNG file showing global renewable trends (1965-2022).
- **Interactive Visualization:** An HTML file enabling dynamic exploration of regional trends.

References

- International Renewable Energy Agency (IRENA). Dataset
- Assignment Guidelines, CS7DS4 / CSU44065 Data Visualization.