Global Relocation Dashboard – Project Summary

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Project Overview

For our final project, we developed an interactive web-based dashboard that enables users to compare and evaluate countries based on global development metrics. Built primarily using Streamlit and Plotly, the tool allows users to prioritize what matters to them when considering relocation, whether it be income, health, safety, or education.

Our analysis centers on the top 50 countries by immigrant population, providing users with the ability to explore and compare these countries through a flexible, visually engaging interface.

Data Collection & Preparation

The project leveraged the World Bank's World Development Indicators dataset, supplemented with UN migration data to identify the 50 countries for analysis. We also integrated a custom topic map to group metrics into seven categories: Education, Employment, Environment, Health, Income, Infrastructure, and Safety.

During data preparation, we:

- Filtered the dataset to focus on the selected countries.
- Cleaned the data by replacing missing values and standardizing formats.
- Extracted the latest available value for each metric.
- Labeled metrics by topic to support intuitive analysis.
- Normalized metric values to a 0–100 scale, accounting for cases where lower values indicate better outcomes.
- Calculated average topic scores for each country.

This process resulted in a clean, structured dataset optimized for interactive analysis.

Dashboard Development

The dashboard was built with user experience in mind, balancing functionality with visual clarity. The layout is organized into three main analysis tabs:

- **Country-Level Analysis**: Allows users to select a country and view its performance across all metrics and topics. Country rankings and topic scores are also displayed.
- **Metric-Level Analysis**: Enables users to choose a metric and view key statistics, top/bottom countries, a choropleth map, and a box plot to assess global distribution.
- **Topic-Level Analysis**: Provides broader comparisons through radar charts, scatter plots, and personalized rankings based on user-defined topic importance weights.

Reusable components such as section dividers and info cards were implemented to maintain consistency and streamline the user interface.

Technical Highlights

- **Streamlit**: Main platform for building the interactive dashboard.
- **Plotly**: Enabled interactive and visually rich charts (bar charts, choropleth maps, radar charts, scatter plots).
- **Pandas and NumPy**: Used for data wrangling, statistical calculations, and normalization.
- **Custom HTML and CSS**: Applied for typography (Google Fonts), layout styling, and polished UI elements.

The backend logic was designed to dynamically update data and visuals based on user inputs, creating a highly responsive experience.

Conclusion

Developing this dashboard was a rewarding experience that combined data processing, visualization, and interface design. We faced challenges such as handling missing data, normalizing diverse metrics, and creating meaningful comparisons across countries, but overcame them through careful planning and Python-based solutions.

The final product offers a user-friendly and customizable way to explore global development metrics and better understand the countries attracting the world's immigrant populations.

The dashboard is live and accessible here: **https://relocation.streamlit.app/**.