



REPORT



GLOBAL MILITARY FIREPOWER 2025: AN END-TO-END PROJECT FROM WEB SCRAPING TO DASHBOARD BUILDING

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Repository: <https://github.com/saiful-islam-rupom/global-military-firepower-2025-web-scraping-to-dashboard-building.git>

1. Project Overview

This project showcases an end-to-end data workflow, beginning with web scraping and ending in interactive dashboard development. Using Python, I scraped military power data from the Global Firepower website, cleaned and prepared it for analysis, and visualized it using Tableau Public. The final result is a comprehensive dashboard suite that provides deep insights into global military capabilities for the year 2025 like top powers, country military profiles, compare two nations side by side based on their military assets, build coalitions that are consist of multiple countries and compare those coalitions.

2. Objective

The objective of this project is to demonstrate an end-to-end data science workflow by extracting real-world military power data from the Global Firepower website using web scraping techniques in Python, cleaning and preparing the data for analysis, and developing an interactive Tableau dashboard. The final product aims to provide policymakers, researchers, and the general public with actionable insights into global military capabilities through visual storytelling and comparative analytics.

3. Methodology

3.1 Data Collection

- Source: [GlobalFirepower.com](https://www.globalfirepower.com)
- Technique: Web scraping using Python (requests, BeautifulSoup)
- Scope: More than 140 countries, covering 50+ military metrics

3.2 Data Processing

- Cleaned and standardized data using pandas
- Handled inconsistencies (e.g., missing values, symbols, special characters)
- Pivoted data for Tableau-ready structure
- Exported as .csv and converted to .xlsx for visualization

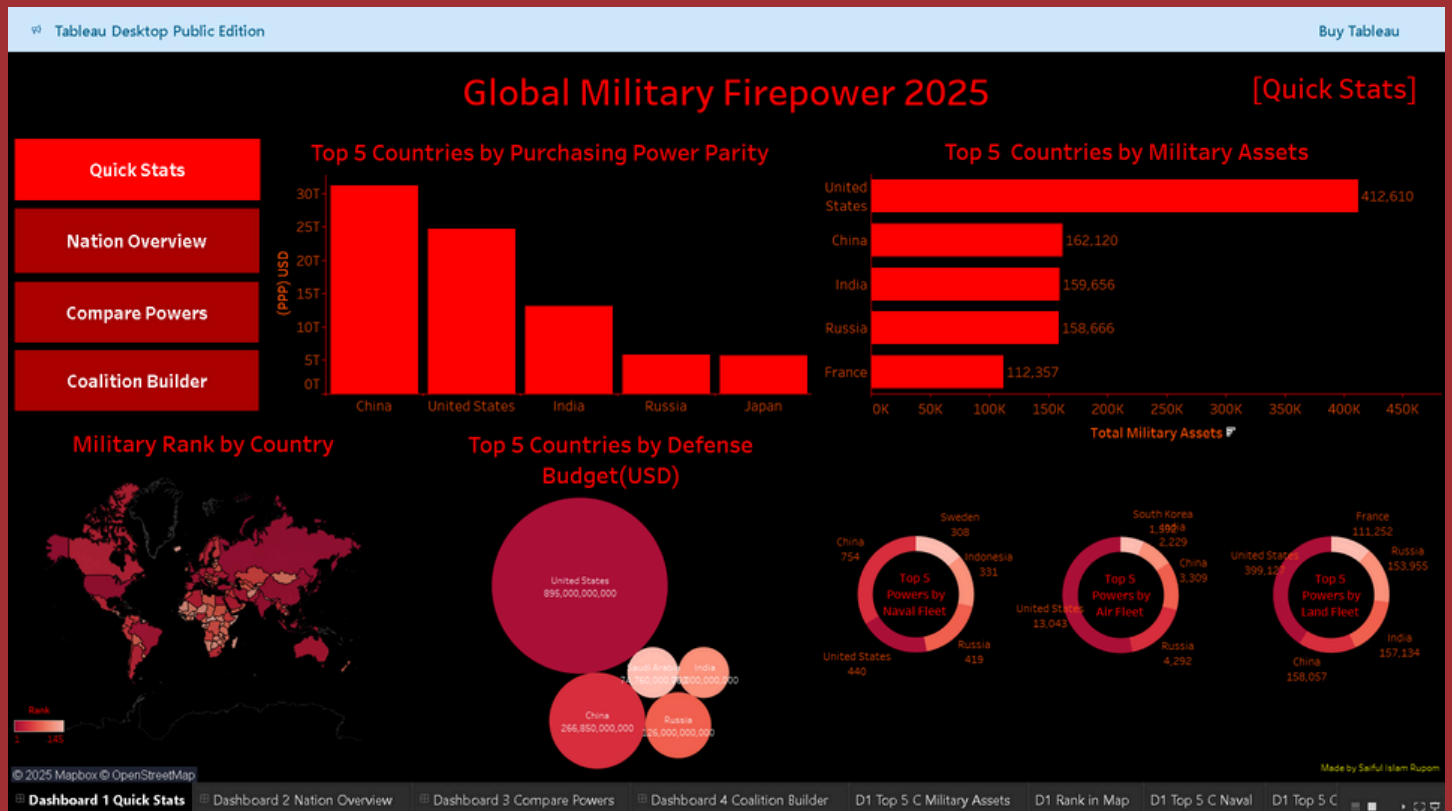
3.3 Data Visualization

- Tool: Tableau Public
- Created 4 dashboards:
 - Quick Stats – Top rankings at a glance
 - Nations Overview – Full military profile per country
 - Compare Powers – Side-by-side comparison between any two nations
 - Coalition Builder – Aggregate view of selected country groups
- Tableau Techniques Used:
 - Parameters: For dynamic selection of countries in comparison views
 - Custom Calculated Fields: For KPIs like "Power Index Rank Gap" and normalization
 - Pivots: Used to reshape data for metric-based filtering and visual grouping
 - Filters and Actions: Enabled drill-down and region-specific analysis
 - Color Scales and KPI Indicators: Highlighted strengths and weaknesses visually

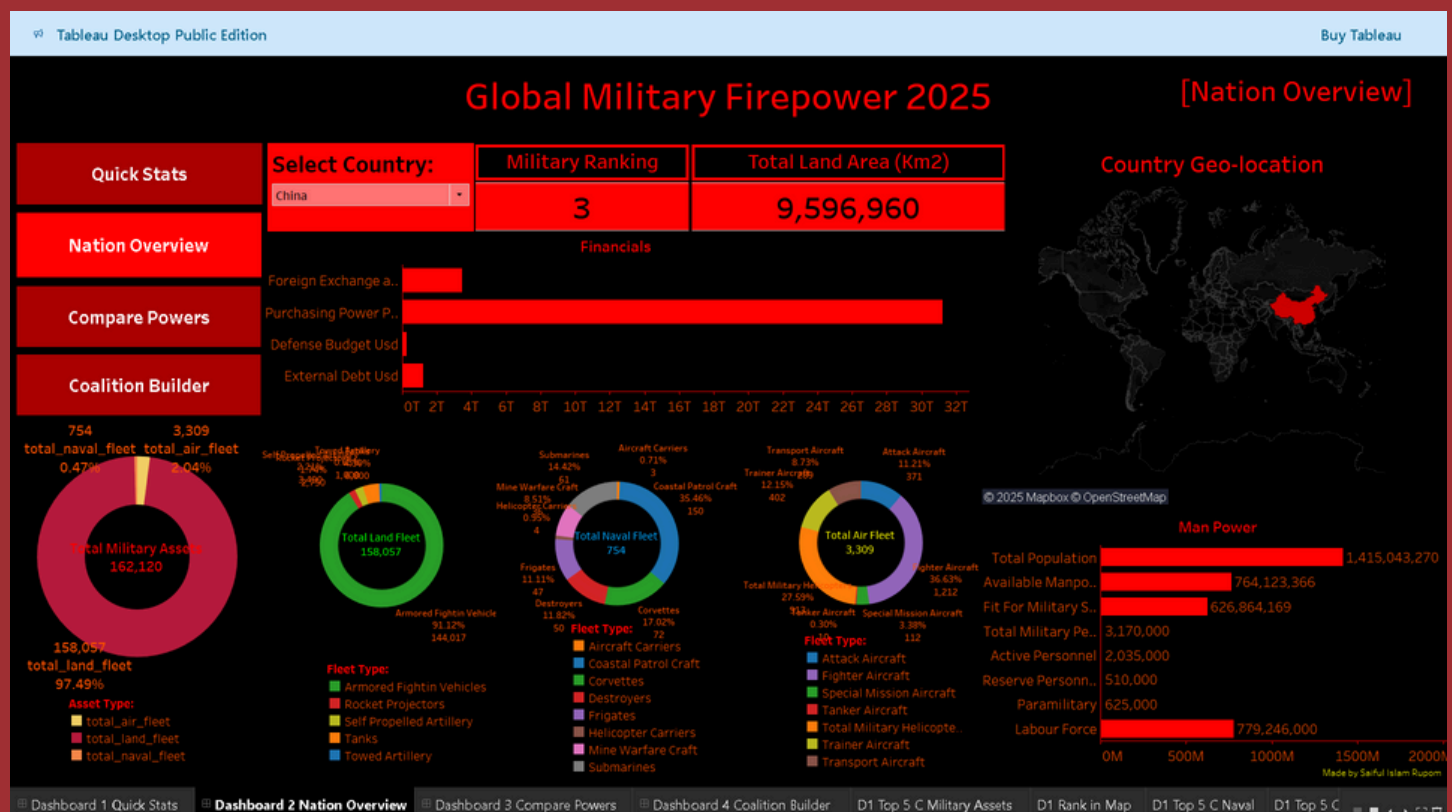
4. Dashboard Previews

Below are visual snapshots of the interactive dashboards developed using Tableau Public:

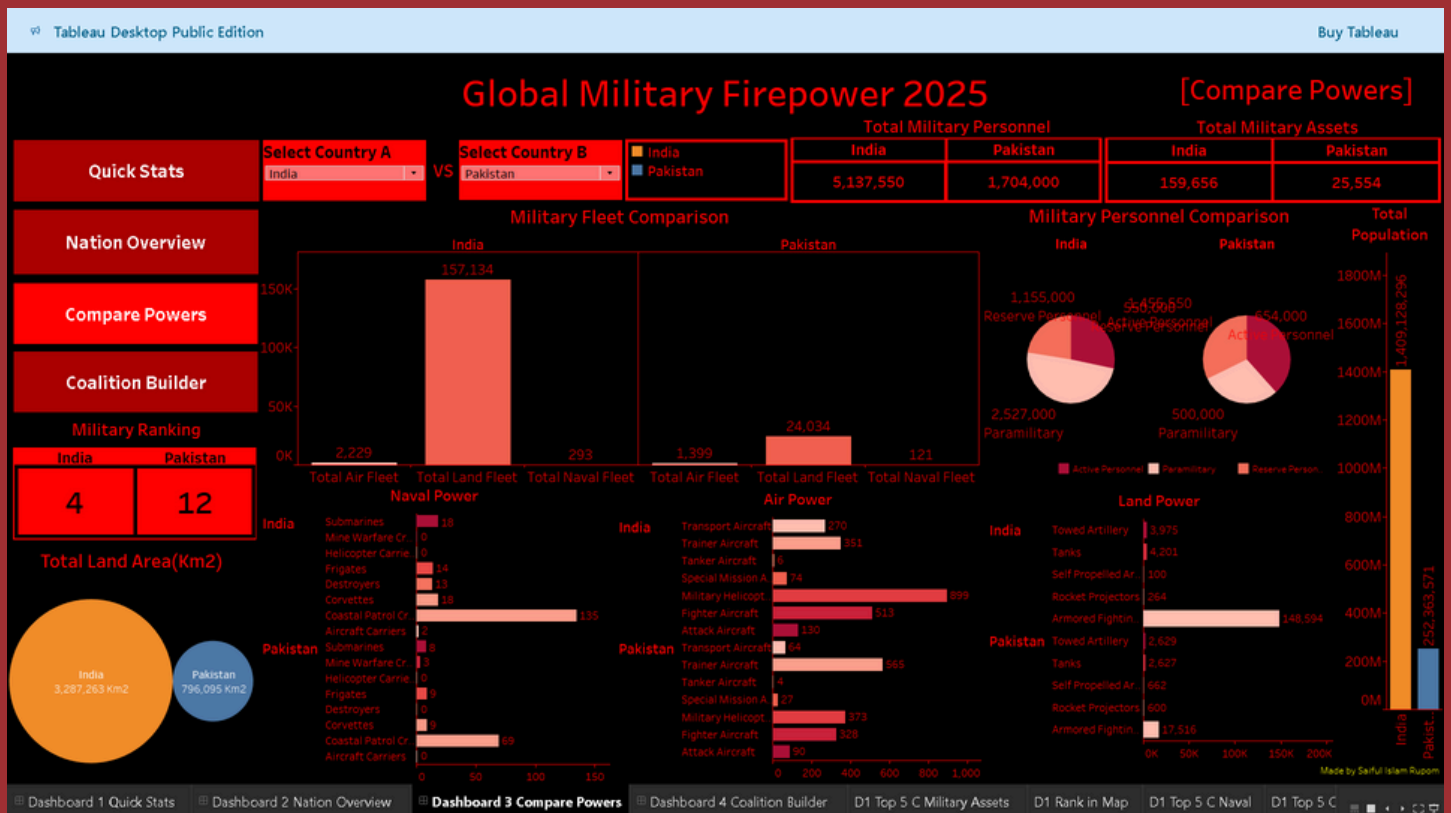
- Quick Stats Dashboard:



- Nations Overview:



• Compare Powers:



• Coalition Builder:



[Click here](#) to view and interact with the dashboard online.
(Note: Online view may show slight distortion or layout changes in visuals)

5. Key Results

- Built an automated data pipeline for reproducible and updated datasets
- Delivered an interactive, multi-dashboard Tableau workbook with dynamic filters and visual storytelling
- Provided comparative, exploratory, and strategic views on military assets and budgetary priorities
- Identified significant disparities in military strength across regions and income groups

6. Challenges & Mitigations

Challenge	Resolution
Dynamic webpage structure	Applied flexible HTML parsing with BeautifulSoup
Data inconsistencies and null values	Used pandas for preprocessing and validation
Dashboard scalability	Implemented filters and parameter controls in Tableau

7. Business Impact & Use Cases

Use Case	Stakeholders
Defense planning and simulation	Military analysts, think tanks
Geopolitical risk analysis	Foreign policy institutions
Educational tools	Universities, defense academies
Public engagement	Journalists, general audience

8. Future Enhancements

- Automate routine updates using scheduling (e.g., cron, Airflow)
- Integrate historical data for trend analysis
- Include geospatial mapping for defense installations
- Extend KPIs to include GDP-to-defense ratio and alliance affiliations

9. Conclusion

This project highlights how open-source data combined with Python and Tableau can create impactful, data-driven insights into global power dynamics. It serves as both a technical showcase and a strategic visualization tool, demonstrating proficiency in data engineering, analysis, and dashboard design.

10. Disclaimer

This project is for educational purposes only. The scraped data complies with the site's terms of use at the time of access.

11. Acknowledgements

Special thanks to GlobalFirepower.com for providing publicly accessible military data.