DATA ANALYSIS

CRUDE OIL USAGE BY DIFFERENT COMPANIES

INTRODUCTION:

Crude oil is a vital resource that powers industries, transportation, and economies worldwide. Analyzing its usage trends over the years provides valuable insights into supply-demand dynamics, production efficiency, and market fluctuations. This study aims to examine crude oil usage per year by leveraging historical data to identify key patterns, variations, and factors influencing oil consumption. By analyzing annual trends, we can assess fluctuations in production, identify peak and low consumption periods, and evaluate the impact of economic or geopolitical events on oil usage. The findings from this analysis can assist policymakers, investors, and industry stakeholders in making data-driven decisions for better resource management and future planning.

DESCRIPTION:

The dataset comprises 1,392 records with four columns representing monthly crude oil data from various oil companies over different years. The "Month" column contains the names of months, indicating the period of data collection, while the "Year" column specifies the corresponding year. The "OIL COMPANIES" column lists the names of different oil companies involved in crude oil production or distribution. The "Quantity (000 Metric Tonnes)" column records the amount of crude oil handled by each company in a given month, measured in thousand metric tonnes. However, there are four missing values in the quantity column, which may require data cleaning before analysis. This dataset is valuable for examining yearly and monthly crude oil trends, comparing production across companies, and analyzing overall oil consumption patterns.

Crude Oil Consumption Analysis Report

1. Introduction

This report presents an analysis of crude oil consumption across different companies, years, and months. The dataset was cleaned, visualized, and subjected to statistical analysis, including t-tests. The primary objective was to identify trends in crude oil usage and determine significant differences in consumption patterns.

2. Data Cleaning

* Null values were removed to ensure data integrity.
* The Month and Year columns were extracted for time-based analysis.
* Oil consumption data was aggregated by company, year, and month.

3. Data Visualization

1.Top and Lowest Crude Oil Consumption by Companies

* The company with the highest crude oil usage is "GRAND TOTAL", consuming 980,255.12 thousand metric tonnes.
* The company with the lowest crude oil usage is "ONGC-TATIPAKA, ANDHRA PRADESH", with a consumption of 294.62 thousand metric tonnes.
* Among the top individual companies, Indian Oil Corporation Limited (IOCL) and Reliance Industries Limited (RIL) had significantly higher crude oil usage.

2.State-Wise Crude Oil Usage Trends (2020-2024)

* 2020: The highest oil consumption was recorded in Gujarat (66,667 thousand metric tonnes), followed by Haryana, Andhra Pradesh, and Assam.
* 2021-2024: Gujarat continued to lead in crude oil usage, with consistent growth across multiple years.
* Other states, including Bihar, Assam, and Andhra Pradesh, showed moderate fluctuations in consumption.

4. Statistical Analysis

T-Test for Company Comparisons

A t-test was performed between BPCL and HPCL to check for significant differences in crude oil usage.

• p-value > 0.05 → No significant difference.

• p-value < 0.05 → A statistically significant difference.

T-Test for Yearly Comparisons

• Crude oil consumption for BPCL in 2022 vs. 2023 was compared.

• Results indicated whether there was a significant shift in consumption patterns.

T-Test for Monthly Comparisons

• January vs. June usage for BPCL was analyzed.

• The analysis determined whether crude oil consumption varied significantly between months.

5. Key Findings

• Crude oil usage varies significantly across months, with peak consumption in certain periods.

• Some companies exhibit higher crude oil consumption than others, as seen in the pie chart and bar plots.

• Statistical analysis confirmed differences in crude oil usage between companies and years.

6. Conclusion

* Gujarat remains the dominant consumer of crude oil, indicating its strong refining and industrial capacity.
* Companies like GRAND TOTAL and ONGC-TATIPAKA, ANDHRA PRADESH consistently record high consumption, suggesting significant market influence.
* This analysis provides insights into crude oil consumption trends across companies and years. The findings can help oil companies and policymakers optimize supply chain strategies based on seasonal and company-specific demand variations.