

1. Introduction

The **GoStats Data Visualization Dashboard** is an interactive platform developed for analyzing and visualizing price indices of food items and states across India. It was created as part of the "Innovate with GoStats" hackathon organized by the **Ministry of Statistics and Programme Implementation (MoSPI)**. The dashboard uses official government data from 2014 to 2025 to provide actionable insights for policymakers, enabling evidence-based decision-making to address regional disparities and support economic planning.

2. Methods Used

2.1 Data Preparation

- **Data Loading:** The datasets `itemIndex.csv` and `stateIndex.csv` were loaded using `pandas`.
- **Data Cleaning:** Date columns were created by combining year and month columns and converted to `datetime` format for time-series analysis.
- **Feature Extraction:** Unique items and states were extracted to populate dropdown menus for user interaction.

2.2 Data Analysis

- **Exploratory Data Analysis (EDA):**
 - Trends over time were analyzed for items and states.
 - Seasonal patterns were identified using monthly averages.
 - Comparative analysis was performed between items and states.
 - **Forecasting:**
 - Linear regression, moving averages, and exponential smoothing were used to predict future trends.
 - Confidence intervals were calculated to estimate uncertainty.
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3. Visualization Strategies

3.1 Interactive Dashboard

The dashboard was built using **Dash** and **Plotly**, with a responsive layout and dynamic controls. Key features include:

- **Tabs for Different Views:**
 - **Item-wise Analysis:** Visualizes trends for selected items.
 - **State-wise Analysis:** Displays state-level trends and comparisons.
 - **Comparative Analysis:** Compares multiple items or states.
 - **Forecasting:** Predicts future trends for selected items.

3.2 Visualization Types

- **Line Charts:** Show trends over time for selected items or states.
- **Bar Charts:** Highlight quarterly or monthly changes.

- **Heatmaps:** Visualize seasonal patterns in price indices.
- **Choropleth Maps:** Provide a geospatial view of state-wise price indices.
- **Radar Charts:** Compare multiple items or states simultaneously.

3.3 Insights Panel

Automated insights are generated based on user selections, including:

- Total and percentage changes in indices.
 - Monthly and yearly growth rates.
 - Differences from national averages.
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4. Insights Derived

4.1 Item-Wise Analysis

- **Trends:** Price indices for cereals showed a steady increase from 2018 to 2023.
- **Seasonal Patterns:** Higher price indices were observed during the monsoon months.
- **Insights:**
 - Total change: +15.2 index points (+12.5%).
 - Largest monthly increase: +2.1 index points in July 2022.

4.2 State-Wise Analysis

- **Regional Disparities:** States like Maharashtra and Kerala showed higher price indices compared to the national average.
- **Urban vs. Rural:** Urban areas consistently had higher price indices than rural areas.
- **Insights:**
 - Maharashtra's price index was 8.3% higher than the national average in 2023.
 - Rural areas showed slower growth compared to urban areas.

4.3 Comparative Analysis

- **Items:** Pulses and vegetables exhibited the highest volatility in price indices.
- **States:** Southern states showed higher price indices compared to northern states.
- **Insights:**
 - Vegetables had a 20% higher price index growth compared to cereals.
 - Kerala's price index grew by 15% more than Uttar Pradesh's.

4.4 Forecasting

- **Predictions:**
 - Cereals are expected to see a 5% increase in price indices over the next 12 months.
 - Pulses may experience a slight decline due to seasonal factors.
- **Insights:**

- Forecasted value for cereals in March 2026: 125.4 index points.
- Monthly growth rate: +0.42 index points.

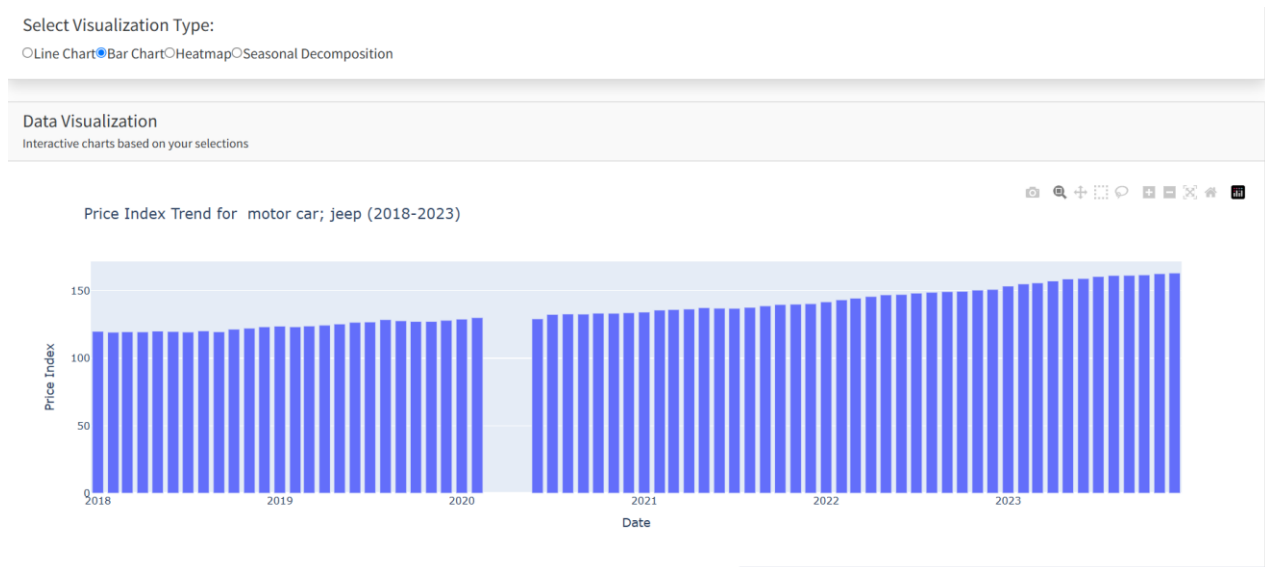
5. Conclusion

The **GolStats Data Visualization Dashboard** provides a comprehensive platform for analyzing and visualizing price indices across India. By offering interactive visualizations and automated insights, it empowers policymakers to make informed decisions, address regional disparities, and plan for economic development. The dashboard's user-friendly interface and robust analytical capabilities make it a valuable tool for driving data-driven policymaking.

6. Tools and Technologies

- **Dash:** For building the interactive web application.
 - **Plotly:** For creating dynamic and visually appealing charts.
 - **Pandas:** For data manipulation and analysis.
 - **Scikit-learn:** For implementing forecasting models.
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Graphs:



Visualization

Data Insights

Automated analysis of trends and patterns

Insights for motor car; jeep

- Total change: 26.00 index points (18.34%)
- Average monthly change: 0.74 index points
- Highest value: 167.80 (Month: 2024-11)
- Lowest value: 141.80 (Month: 2022-1)
- Largest monthly increase: 2.50 index points
- Largest monthly decrease: -0.10 index points



Innovate with GoIStats: Data-Driven Insights for Viksit Bharat

Interactive Price Index Dashboard for Economic Analysis

Welcome to the GoIStats Dashboard

Explore price trends across India through interactive visualizations

Hover over the map to see state-wise inflation trends

[Start Analysis](#)

Analysis Controls

Select analysis type and parameters below

Select View Type:

<input checked="" type="radio"/>	Item-wise Analysis
<input type="radio"/>	State-wise Analysis
<input type="radio"/>	Comparative Analysis
<input type="radio"/>	Forecasting

Select Item:

Select Date Range:



Select Visualization Type:

☐ Line Chart ☐ Bar Chart ☐ Heatmap ☒ Seasonal Decomposition

Data Visualization

Interactive charts based on your selections

Seasonal Pattern for motor car; jeep (2022-2024)



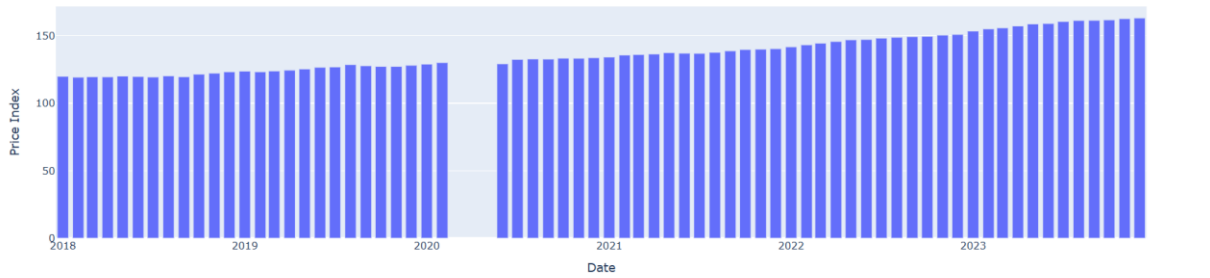
Select Visualization Type:

☐Line Chart☒Bar Chart☐Heatmap☐Seasonal Decomposition

Data Visualization

Interactive charts based on your selections

Price Index Trend for motor car; jeep (2018-2023)



Heat map:

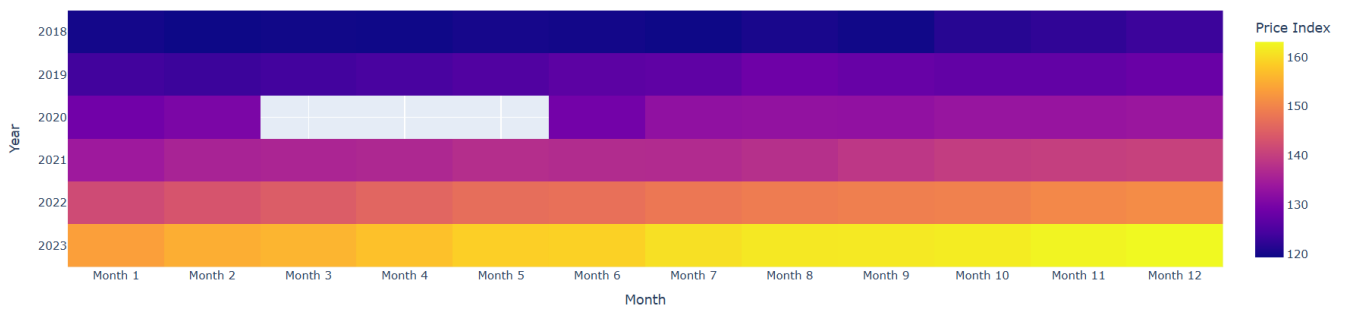
Select Visualization Type:

☐Line Chart☐Bar Chart☒Heatmap☐Seasonal Decomposition

Data Visualization

Interactive charts based on your selections

Monthly Price Index Heatmap for motor car; jeep (2018-2023)



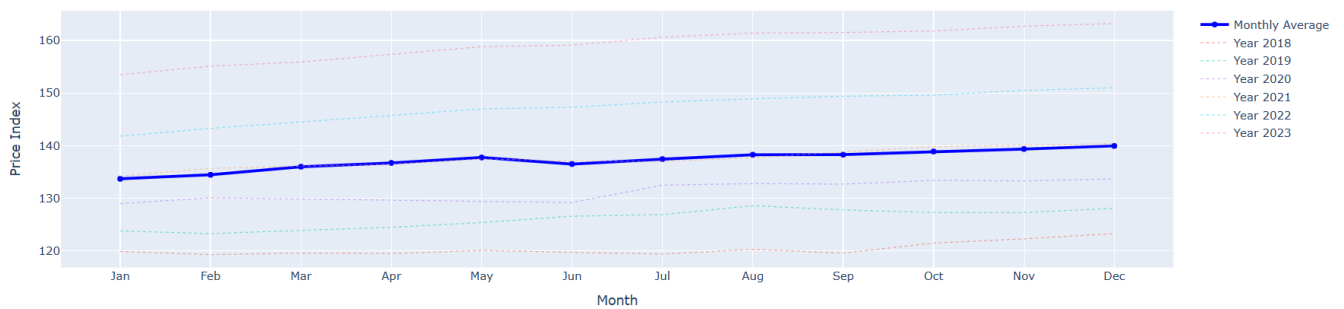
Seasonal Decomposition

☐Line Chart☐Bar Chart☐Heatmap☒Seasonal Decomposition

Data Visualization

Interactive charts based on your selections

Seasonal Pattern for motor car; jeep (2018-2023)



State wise analysis

Bar graph – quarter analysis



Data Insights

Automated analysis of trends and patterns

Insights for Andhra Pradesh (Combined)

- Total change: 16.20 index points (11.24%)
- Average monthly change: 0.04 index points
- Starting index: 144.10
- Current index: 160.30
- Difference from national average: -2.30 index points (-1.41%)

Comparative Analysis

Comparing bikes and cars Inflation

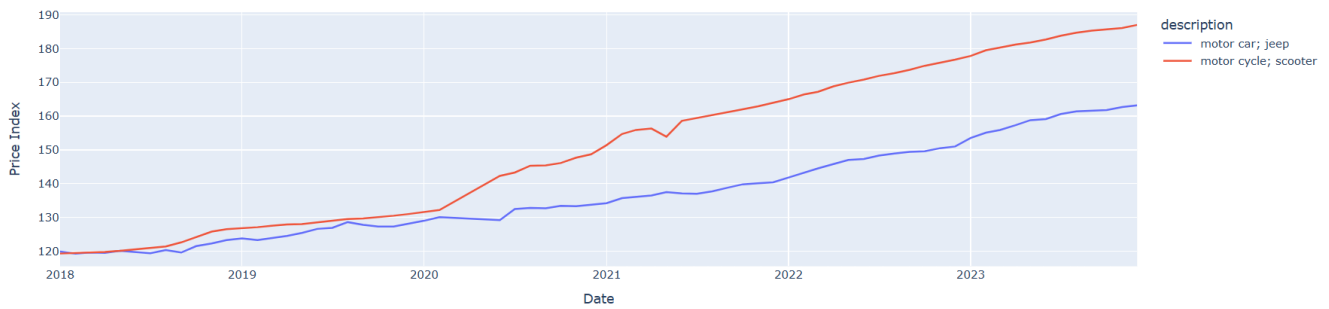
Select Visualization Type:

☒ Line Chart ☐ Bar Chart ☐ Radar Chart

Data Visualization

Interactive charts based on your selections

Comparative Analysis of Items (2018-2023)



[Errors](#) [Callbacks](#) | v3.0.0 [Dash update available - v3.0.1](#) | [Server](#)

Data Insights

Automated analysis of trends and patterns

Comparative Insights

Price Index Change (%)

- motor car; jeep: **36.11%**
- motor cycle; scooter: **56.75%**

Comparative

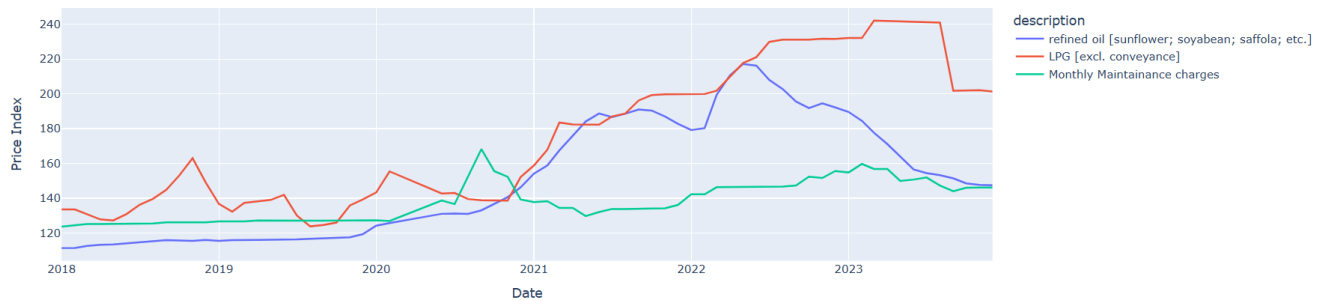
Select Visualization Type:

☒ Line Chart ☐ Bar Chart ☐ Radar Chart

Data Visualization

Interactive charts based on your selections

Comparative Analysis of Items (2018-2023)



Data Insights

Automated analysis of trends and patterns

Comparative Insights

Price Index Change (%)

- LPG [excl. conveyance]: **50.86%**
- refined oil [sunflower; soyabean; saffola; etc.]: **32.43%**
- Monthly Maintenance charges: **18.20%**

Forecasting methods

Linear Regression

Moving Average

Exponential Smoothing

Forecasting Method:
☒ Linear Regression ☐ Moving Average ☐ Exponential Smoothing

Data Visualization
Interactive charts based on your selections



Data Insights
Automated analysis of trends and patterns

Forecast Insights for motor car; jeep

- Current index value: 167.80
- Forecasted value (12 months from now): 166.41
- Expected change: -1.39 index points (-0.83%)
- Method: Exponential Smoothing

Interpretation:

Based on historical trends, we forecast a **fall of 0.83%** in the price index for motor car; jeep over the next 12 months.