📊 Unemployment Data Analysis Report

1. Introduction

This report presents an exploratory and analytical study of unemployment data in India. The goal is to understand the unemployment trends across different regions and demographics, visualize patterns, and identify factors affecting employment.

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2. Dataset Overview

- **Source**: (e.g., Ministry of Labour and Employment, Government of India)
- **Features**:
    - `Region`: State or region name
    - `Date`: Monthly or quarterly timestamp
    - `Estimated Unemployment Rate (%)`
    - `Estimated Employed`
    - `Estimated Labour Participation Rate (%)`
- **Period Covered**: (e.g., January 2020 to December 2021)

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3. Data Cleaning & Preprocessing

- Handled missing values and outliers
- Converted date formats to datetime type
- Renamed columns for readability

- Filtered data for relevant time frames and regions

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4. Exploratory Data Analysis (EDA)

4.1 Unemployment Rate by Region

- Bar plots and line graphs show regional unemployment distribution.
- Key observations:
    - States like **Tripura** and **Haryana** have higher unemployment.
    - States like **Meghalaya** have consistently low unemployment.

4.2 Temporal Trends

- Time-series plots illustrate how unemployment rates changed over months.
- Significant spikes observed during:
    - COVID-19 lockdown periods (March–June 2020)
    - Post-lockdown recovery in late 2020 and early 2021

4.3 Labor Force Participation

- Participation rate directly influences employment figures.
- Some regions showed high unemployment despite high participation, indicating job scarcity.

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5. Visualization Highlights

- **Line plots**: Monthly trend of unemployment rate.

- **Bar charts**: State-wise unemployment comparison.
- **Heatmaps**: Correlation among employment, labor participation, and unemployment.

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6. Insights & Conclusions

- COVID-19 had a sharp, immediate impact on employment across all states.
- Recovery was uneven, with urban states recovering faster than rural regions.
- Some states consistently perform better in employment generation.

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7. Recommendations

- Skill development programs should be intensified in high-unemployment regions.
- Promote remote work and digital employment in rural areas.
- Seasonal and contract employment data can improve future predictions.

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8. Future Work

- Incorporate demographic variables like age and gender.
- Apply forecasting models (e.g., ARIMA, LSTM) for unemployment trends.
- Compare unemployment trends with GDP or inflation data.