Unemployment Analysis using Python

1. Introduction

Unemployment is one of the most critical indicators of a country's economic health. It represents the proportion of people who are willing and able to work but are unable to find employment. The Covid-19 pandemic caused widespread disruptions across industries, leading to a sudden increase in unemployment levels across India.

This project aims to analyze unemployment trends in India using data analysis and visualization techniques.

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2. Problem Statement

Unemployment is measured by the unemployment rate, which is calculated as the number of unemployed people divided by the total labour force. During the Covid-19 pandemic, India witnessed a sharp increase in unemployment. This project focuses on analyzing unemployment rates across different regions and time periods to understand the impact of Covid-19 on employment.

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3. Dataset Description

The dataset consists of monthly unemployment data collected across various Indian states and regions. It contains approximately 800 records and includes the following attributes:

- Region
- Date
- Estimated Unemployment Rate (%)
- Estimated Employed Population
- Estimated Labour Participation Rate (%)
- Area (Urban/Rural)

An additional dataset contains region-wise unemployment statistics along with geographical information.

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4. Data Preprocessing

The preprocessing steps include:

- Converting date columns into datetime format
- Renaming columns for consistency
- Handling missing or null values
- Separating datasets based on analysis requirements

These steps ensure that the data is clean and ready for analysis.

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5. Exploratory Data Analysis (EDA)

Exploratory Data Analysis is performed to understand unemployment patterns and trends. Various visualizations are used to analyze:

- Overall unemployment trend over time
- Regional unemployment distribution
- Rural versus urban unemployment rates
- Unemployment changes during the Covid-19 lockdown period

The analysis clearly shows a sharp rise in unemployment during April–May 2020, coinciding with nationwide lockdowns.

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6. Impact of Covid-19

The Covid-19 pandemic had a significant impact on employment across India. Urban regions experienced a larger increase in unemployment due to shutdowns in industries, offices, and service sectors. Rural areas were relatively less affected but still showed noticeable changes.

The data also indicates a gradual recovery phase as restrictions were eased.

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7. Key Insights

- Unemployment peaked during the strict lockdown phase
- Urban unemployment was higher than rural unemployment
- Different regions experienced varying levels of impact
- Employment recovery trends are visible post-lockdown

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8. Conclusion

This project successfully analyzed unemployment trends in India using data visualization and exploratory analysis. The findings highlight the severe impact of Covid-19 on employment, especially in urban regions. Such insights can help policymakers design targeted employment recovery programs.

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9. Future Scope

The analysis can be extended by:

- Including more recent unemployment data
- Applying predictive models to forecast unemployment trends
- Conducting state-wise and sector-wise unemployment analysis