

# Exploratory Data Analysis of Rainfall Data in India for Agriculture

## Project Description

This project focuses on analyzing historical rainfall data across different states and regions of India to understand rainfall patterns, seasonal distribution, variability, and its impact on agricultural productivity. Since a large portion of Indian agriculture depends on monsoon rainfall, analyzing rainfall trends helps in crop planning, drought management, irrigation strategies, and agricultural decision-making.

## Project Objectives

- Identify rainfall trends over different years.
- Analyze seasonal rainfall distribution.
- Compare rainfall patterns across different states.
- Detect drought and excess rainfall years.
- Support agricultural planning using rainfall insights.

## Project Flow

- Problem Understanding: Define objectives and key rainfall-related questions.
- Data Collection: Gather rainfall dataset from reliable sources such as IMD or Kaggle.
- Data Preprocessing: Handle missing values, remove duplicates, convert data types, and create new features.
- Exploratory Data Analysis: Perform univariate and bivariate analysis with visualizations.
- Insights Extraction: Identify trends, drought years, and high rainfall regions.
- Conclusion & Recommendations: Summarize findings and suggest agricultural planning strategies.

## Project Structure

```
Rainfall-EDA-India/  
data/ (rainfall dataset)  
notebooks/ (EDA notebook file)  
images/ (visualizations)  
src/ (data preprocessing and visualization scripts)  
reports/ (project report PDF)  
README.md  
requirements.txt  
.gitignore
```