# Project Summary: Telecom Customer Churn Analysis

## 🔹 Introduction to the Project

- **Purpose**: This project analyses customer churn in a telecom company, identifying key factors that influence whether customers stay or leave.
- **Problem Solved**: Helps telecom companies understand churn patterns and take proactive measures to reduce customer loss.
- **Domain**: Business analytics, customer retention.

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## 🔹 Key Features and Components

- **Main Functionalities**:
  - Loads and preprocesses telecom customer data.
  - Calculates churn percentages.
  - Visualizes churn trends with bar plots and count plots.
- **Libraries Used**:
  - pandas – Data handling.
  - numpy – Mathematical calculations.
  - matplotlib & seaborn – Data visualization.

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## 🔹 Mathematical Explanation

- The project likely calculates **churn rates** as:

  Churn Rate = (Number of churned customers / total customers) × 100

- It also computes percentage distributions and uses **grouping techniques** for segmentation.

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## 🔹 Steps and Workflow

1. **Load Data**: The dataset (`telecom_customer_churn.csv`) is read into a Pandas
2. **Preprocessing**: Data is structured and missing values handled.
3. **Exploratory Data Analysis (EDA)**:
   - Customer status distribution is analysed.
   - Percentage-wise churn calculation is performed.
   - Count plots visualize key service features (e.g., internet service, security plans).
4. **Mathematical Computations**: Churn percentages, revenue distribution, and customer segmentation are calculated.

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### 🔹 Results and Insights

- **One-third of customers have churned**, indicating a significant retention issue.
- **Certain services (e.g., Premium Tech Support) have lower adoption**, potentially impacting customer satisfaction.
- **Revenue contributions by customer status** are analysed to understand how churn affects financial performance.

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### 🔹 Challenges and Future Work

- **Challenges**:
  - Handling missing or inconsistent data.
  - Identifying the exact factors causing churn.
  - Need to understand why senior citizens are churning the most.

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## 🔹 Conclusion

This project provides **valuable insights into telecom customer churn**, offering both statistical and visual analysis. By identifying key trends and patterns, telecom companies can **develop better retention strategies** and improve customer satisfaction.