**Telco Customer Churn Analysis**

## **Project Overview**

This project aims to analyse customer churn in the telecom sector, identify key factors influencing churn, predict customer churn using machine learning, and visualize insights using Power BI.

## **Key Objectives**

1. **Understand Churn Patterns:** Identify the factors contributing to customer churn.
2. **Predict Churn:** Build a machine learning model to predict customer churn based on historical data.
3. **Visualize Insights:** Create an interactive Power BI dashboard to present findings.

## **Data Preprocessing**

* Handled missing values by imputing or dropping null columns.
* Encoded categorical variables using label encoding and one-hot encoding.
* Applied **MinMaxScaler** for numerical feature scaling.

## **Model Building & Evaluation**

* **Algorithm Used:** Logistic Regression.
* **Train-Test Split:** 80-20 split.
* **Performance Metrics:** Accuracy, Precision, Recall, F1-score.
* **Prediction on New Data:** Implemented transformation and prediction pipeline.

## **Power BI Dashboard**

### Visualizations Included:

1. **Churn Rate KPI** – Displays the percentage of customers who churned.
2. **Revenue Lost Due to Churn** – A stacked bar chart based on contract type.
3. **Churn by Contract Type** – A pie chart showing churn distribution.
4. **Customer Tenure vs. Churn** – A line chart analyzing tenure trends.
5. **Retention Rate KPI** – Measures customer retention.
6. **Filters/Slicers** – Allows users to filter data by contract type, tenure, etc.

## **Key Findings**

* Customers on **month-to-month contracts** have the highest churn rate.
* **Higher tenure customers** are more likely to stay.
* **Revenue loss due to churn** is significant, requiring retention strategies.

## **Conclusion**

This project provides valuable insights into customer churn patterns, builds an effective predictive model, and presents data-driven decisions through visualization. It showcases **data wrangling, machine learning, and dashboarding** skills, making it an industry-standard project.