Customer Churn Analysis & Prediction Project Report

1️⃣ Project Overview

This project performs **customer churn analysis and predictive modelling** using:

- **Power BI** → Business insights & dashboards
- **Python (Machine Learning)** → Churn probability prediction
- **Kaggle Dataset** → Telco Customer Churn

The goal is to help the business identify **why customers churn**, **who is most likely to leave**, and define **retention strategies**.

2️⃣ Business Problem

Telecom companies lose significant revenue when customers churn.
Management needs to answer:

- Which segments have higher churn?
- What factors drive churn?
- Can we **predict churn risk** to intervene early?

This project delivers both **descriptive analytics** and **predictive analytics**.

3️⃣ Dataset (Kaggle Source)

Dataset Name: **Telco Customer Churn**
Contains **7,043 records** with demographic, service, billing & contract details.
Target field → Churn (Yes/No)

Key variables include:

- Tenure, Monthly Charges, Total Charges
- Contract Type, Payment Method
- Internet Services & Add-ons
- Customer demographics

4️⃣ Project Workflow

Step 1 — Data Cleaning (Power BI & Python)

- Converted Total Charges to numeric
- Handled missing values
- Created churn flag
- Standardized column types

Step 2 — Exploratory Churn Analysis (Power BI)

KPIs analyzed:

- Total Customers
- Churned vs Retained
- Churn Rate %
- Avg Tenure | Avg Monthly Charges
- Churn by Contract, Payment, Internet Service

Step 3 — Churn Prediction Model (Python)

- Logistic Regression classifier
- Features selected:
    - Tenure, Monthly Charges, Total Charges
    - Contract, Internet Service, Payment Method
- Output generated:
    - Churn Probability
    - Churn Predicted

Exported file → **Telco_Churn_Predictions.csv**

Step 4 — Prediction Integrated into Power BI

- Joined predictions to customer table
- Built **risk segmentation dashboard**:
    - High-risk customers
    - Medium-risk customers
    - Low-risk customers

5 Key Insights

- **Month-to-Month contracts** have the highest churn
- Customers with **higher Monthly Charges** churn more frequently
- Lack of **Online Security & Tech Support** increases churn risk
- Early-tenure customers are more likely to churn
- High-risk customers cluster in **Fiber + Electronic Check** segment

6 Recommendations

- Offer **discounts for long-term contracts**
- Design **retention plans for high-risk customers**
- Improve **customer onboarding in first 3–6 months**
- Introduce **bundled service offers**
- Run **targeted pricing optimization campaigns**

7 Tools & Technologies

- Power BI
- Python (pandas, scikit-learn)
- DAX Measures
- Kaggle Dataset

8 Deliverables

- Power BI Dashboard (.pbix)
- Python Model Notebook (.ipynb)
- Prediction Output (Telco_Churn_Predictions.csv)
- README + Report

9 Future Enhancements

- Deploy API-based real-time churn scoring

- Use XGBoost / Ensemble models
- Add Customer Lifetime Value (CLV)
- Automate CRM integration

Thank You