Customer Churn Prediction using Machine Learning

Objective

The goal of this project is to build a machine learning model that predicts whether a customer will churn (i.e., stop using a service) based on historical data.

Technologies Used

Python, Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, Jupyter Notebook

Dataset

We used a sample Telco Customer Churn dataset which includes:

- Customer ID
- Demographic info (Gender, Age, etc.)
- Service details (Internet, Phone)
- Contract type (Month-to-month, One year, etc.)
- Monthly charges
- Churn (Yes/No)

Workflow

1. Data Preprocessing: Cleaning, handling missing values, encoding categorical variables.
2. Train-Test Split: Splitting the dataset into training and test sets.
3. Model Training: Using machine learning algorithms (e.g., Random Forest, Logistic Regression).
4. Model Evaluation: Accuracy, confusion matrix, classification report.

Results

Achieved an accuracy of ~80-85% depending on the dataset and model. Key influencing features included contract type, monthly charges, and tenure.

Conclusion

Customer churn prediction helps businesses to:

- Retain customers by offering targeted solutions.

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- Improve customer service.
- Increase long-term revenue.