

## Steps for the Project:

### 1. Data Cleaning and Preprocessing:

- Handle missing values (e.g., **TotalCharges** might have some blanks).
- Convert categorical data into numerical format using one-hot encoding or label encoding.
- Standardize numerical columns (**MonthlyCharges**, **TotalCharges**).

### 2. Exploratory Data Analysis (EDA):

- Analyze churn rates by various features such as contract type, internet service type, and monthly charges.
- Visualize data using charts (bar plots, histograms, box plots, etc.).
- Identify correlations between features using a heatmap.

### 3. Feature Engineering:

- Create new features (e.g., **AverageMonthlySpend** by dividing **TotalCharges** by **Tenure**).
- Remove irrelevant or highly correlated features.

### 4. Model Building:

- Split the dataset into training and testing sets.
- Use machine learning models such as:
  - Logistic Regression
  - Random Forest
  - Gradient Boosting (e.g., XGBoost, LightGBM)
- Train and tune the model using cross-validation.

### 5. Model Evaluation:

- Evaluate the model using metrics like:
  - Accuracy
  - Precision
  - Recall
  - F1-Score
  - ROC-AUC Curve

### 6. Create a Dashboard:

- Create a simple dashboard using **Power BI** . . .

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## Tools and Technologies:

- **Programming Language:** Python
- **Libraries:**
  - Data Cleaning and Analysis: Pandas, NumPy
  - Visualization: Matplotlib, Seaborn
  - Machine Learning: Scikit-learn, XGBoost
- **Dashboard** : PowerBI for creating an interactive dashboard