**Project: Customer Churn Prediction Using Telco Customer Churn Dataset**

**Objective:**

Develop a machine learning model to predict customer churn in a telecommunications company using the Telco Customer Churn dataset. The model will help the company identify customers who are likely to churn, enabling them to take proactive steps to retain these customers.

**Dataset Description:**

The Telco Customer Churn dataset contains information about a telecommunications company's customers, including demographics, account information, services subscribed, and whether or not they churned.

**Dataset Link:** [**https://drive.google.com/file/d/1JOqcR8X0GcFQAivwMzP2cGrTyhZ-4\_j2/view?usp=sharing**](https://drive.google.com/file/d/1JOqcR8X0GcFQAivwMzP2cGrTyhZ-4_j2/view?usp=sharing)

**Key Features:**

- Customer ID: Unique identifier for each customer.

- Gender: Customer's gender (Male/Female).

- Senior Citizen: Indicates if the customer is a senior citizen (1 = Yes, 0 = No).

- Tenure: How long the customer has been with the company (in months).

- Monthly Charges: The amount charged to the customer monthly.

- Total Charges: The total amount charged to the customer.

- Contract: Type of contract (Month-to-month, One year, Two years).

- Internet Service: Type of internet service subscribed to (DSL, Fiber optic, None).

- Payment Method: The method of payment used by the customer (e.g., electronic check, mailed check).

- Churn: Whether the customer churned (Yes/No).

**Project Phases:**

**1. Data Exploration and Preprocessing:**

- Load the dataset and understand its structure.

- Handle missing values, if any.

- Perform data cleaning and transformations as needed.

- Convert categorical variables to numerical values using techniques like one-hot encoding.

- Feature scaling, if necessary.

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

- Visualize the distribution of customers who churned vs. those who did not.

- Analyze the relationship between features like tenure, monthly charges, contract type, and churn.

- Identify any patterns or trends that might indicate potential churn.

**3. Model Development:**

- Split the dataset into training and testing sets.

- Train multiple machine learning models (e.g., Logistic Regression, Decision Trees, Random Forest, XGBoost) to predict churn.

- Perform hyperparameter tuning to optimize model performance.

**4. Model Evaluation:**

- Evaluate models using metrics like accuracy, precision, recall, F1-score, and ROC-AUC.

- Compare the performance of different models and select the best one.

- Use cross-validation to ensure the model's robustness.

**5. Model Interpretation and Insights:**

- Analyze feature importance to understand which factors contribute most to customer churn.

- Provide actionable insights and recommendations based on the model’s predictions.

**6. Deployment and Reporting:**

- Prepare the final model for deployment, ensuring it can be used in a real-time setting.

- Document the entire process, including data preprocessing, model training, and evaluation.

- Create a report summarizing the methodology, key findings, and business recommendations.

**Deliverables:**

- A well-documented Jupyter notebook or Python script containing the entire workflow.

- The final machine learning model ready for deployment.

- A report detailing the approach, results, and recommendations

**Timeline:**

- Days 1-5: Data Exploration and Preprocessing

- Days 6-10: Exploratory Data Analysis (EDA)

- Days 11-17: Model Development and Hyperparameter Tuning

- Days 18-21: Model Evaluation and Interpretation

- Days 22-23: Deployment Preparation

- Days 24-25: Final Documentation and Reporting

**After completing your assigned project, you can push you project to GitHub or Google Drive or Google Collab & submit the link in the task submission form!**

**Feel free to let me know if you need further clarification or assistance with any aspect of the project!** [**internship.innobyteservices@gmail.com**](http://internship.innobyteservices@gmail.com)

**Task Submission Link:** [**https://forms.gle/KBqjYVUqG8zXX9zy8**](https://forms.gle/KBqjYVUqG8zXX9zy8)