Assignment (1) **Name: Mariam Alaa ElDin Mohamed Moselhi**

1. Problem Definition

Goal: Understand the main factors driving customer churn and set a target to reduce it.

Take: Define churn clearly (e.g., account cancellation) and set a measurable target like reducing churn by a specific percentage in the next three months.

2. Data Collection

Goal: Gather customer-related data such as demographics, services, billing, and churn status.

Take: Ensure the data captures all relevant details like customer demographics, service usage, and any interactions with support teams. Include data from different time periods to capture trends.

3. Data Cleaning and Preprocessing

Goal: Prepare the dataset for analysis by handling missing values, standardizing formats, and removing irrelevant or erroneous data.

Take: Clean up missing information, convert categorical data into numerical values, and ensure the dataset is consistent and usable for analysis.

4. Exploratory Data Analysis (EDA)

Goal: Identify trends and correlations that may explain customer churn, like customer tenure, services used, and billing issues.

Take: Use visualizations (bar charts, heatmaps) to explore how factors like contract type, service usage, and payment methods relate to churn. Find key features that strongly influence customer decisions.

5. Modeling

Goal: Build a machine learning model to predict churn and identify at-risk customers.

Take: Use classification algorithms (e.g., Logistic Regression, Random Forest) to predict churn based on the dataset. Focus on models that capture important factors affecting customer decisions.

6. Evaluation

Goal: Assess model performance using relevant metrics like precision, recall, and F1-score to optimize accuracy in predicting churn.

Take: Tune the model by adjusting hyperparameters and using cross-validation. Focus on recall to capture as many potential churners as possible.

7. Deployment and Monitoring

Goal: Deploy the model for real-time churn prediction and continuously monitor its accuracy and relevance.

Take: Set up the model to predict customer churn regularly, and adjust it based on new data and feedback. Track the model's effectiveness in reducing churn over time.