You are a data scientist hired by TelCoX, a telecommunications company struggling with high customer churn rates. Your mission is to build a logistic regression model to predict customer churn and provide actionable insights to reduce churn. You are given access to a Kaggle dataset containing historical customer data.

1. Data Preprocessing:
   a. Load the TelCoX Customer Churn Dataset and inspect its structure.

   b. Handle missing values appropriately.

   c. Encode categorical variables for modeling.

2. Logistic Regression Model Building:

   a. Split the dataset into training and testing sets (80% training, 20% testing).

   b. Build a baseline logistic regression model using default settings.

   c. Train the model on the training data.

3. Model Evaluation and Visualization:

   a. Evaluate the model's performance on the testing data using the following metrics:
      - Accuracy
      - Precision
      - Recall
      - F1-score
      - ROC AUC
      - Cohen's Kappa Score
      - Matthews Correlation Coefficient

   b. Create a confusion matrix visualization.

   c. Plot the ROC curve and calculate the AUC.

   d. Visualize the precision-recall curve.

   e. Plot the log loss function curve during model training.

4. Sigmoid Curve:

a. Provide a clear visualization of the sigmoid (logistic) curve used in logistic regression. Explain its significance.

5. Hyperparameter Tuning:

a. Perform hyperparameter tuning to optimize the logistic regression model. Experiment with different values for at least one hyperparameter.

b. Discuss how hyperparameter tuning affects the model's performance.

6. Recommendations:

a. Based on your analysis, provide actionable recommendations to TelCoX on reducing customer churn.