Configuration Manual for the Churn Prediction

This manual outlines the steps required to set up and execute the churn prediction notebook. Ensure the prerequisites are installed and the dataset is available before proceeding.

1. Prerequisites

Install the following software and libraries:

- **Python** (Version 3.7 or higher)

- Required Python libraries:

```
pip install pandas numpy scikit-learn matplotlib seaborn keras shap lime
```

2. Dataset

- Ensure the dataset file (Telecom_Churn.csv or equivalent) is placed in the same directory as the notebook.

- Verify that the dataset includes features such as "Tenure," "Monthly Charges," and "Contract Type."

3. Running the Notebook

1. **Open Jupyter Notebook**:
   Launch the Jupyter Notebook environment by typing:

```
Jupyter  notebook
```

2. **Load the Notebook**:
   Navigate to the directory containing the .ipynb file and open it.

3. **Execute Cells Sequentially**:

   o Run each cell in sequence by pressing **Shift + Enter**.

   o Ensure preprocessing steps (e.g., handling missing values, scaling) are completed before training models.

4. Configuration Settings

- **Train-Test Split**:
  Adjust the split ratio in the preprocessing cell (default is 80% training, 20% testing).

- **Hyperparameter Tuning**:
  Modify parameters such as the number of trees for Random Forests or learning rate for Gradient Boosting in the respective cells.

5. Outputs

- **Model Metrics**:
  Accuracy, Precision, Recall, F1-Score, and AUC-ROC scores for all models.

- **Feature Importance**:
  Visualizations from SHAP and LIME for model interpretability.

6. Saving Results

- **Export Models**:
  Models are serialized using joblib. Update the save path if required in the final cell.

```
from joblib import dump

dump(model, 'model_filename.joblib')
```

- **Visualizations**:
  Generated graphs and charts can be saved directly from the notebook interface by right-clicking on the visual and selecting **Save As**.

7. Troubleshooting

- **Library Not Found**:
  Reinstall missing libraries using pip.

- **Dataset Errors**:
  Ensure the dataset matches the required schema and is correctly loaded.

- **Kernel Crashes**:
  Restart the kernel using the **Kernel > Restart & Run All** option in Jupyter Notebook.