Project Proposal: Customer Churn Prediction using ANN (Group-18)

Problem Statement:

Customer Churn Prediction refers to detecting which customers are likely to leave or cancel a service. The cost of acquiring new clients is often higher than the cost of retaining existing clients. Therefore, it is important for companies to predict churn accurately and mitigate it in a timely manner to retain valuable customers and sustain long-term profitability.

Proposed Solution:

We will be developing a proactive approach to identify potential churning customers using Artificial Neural Networks (ANN), a deep learning technique. ANNs are highly effective at recognizing complex patterns within large datasets. Customer churn prediction involves analyzing a multitude of factors, including customer behavior, demographics, and transaction history. ANNs are proficient at capturing non-linear relationships within the data, which the traditional statistical methods may find challenging. This approach allows us to experiment with various architectures, layer configurations, and hyperparameters to optimize the model. With proper training and optimization, ANNs have the potential to achieve high accuracy in predicting customer churn, aiding in more informed decisions for customer retention strategies.

Methodology:

Data Collection and Preprocessing: Gather diverse information such as transaction history, demographic information, customer support interactions, and behavioral data from various sources. To make sure the dataset is appropriate for ANN, perform data cleaning, which includes handling missing values, outlier detection, and data transformation.

Feature Engineering: Identify the most influential feature and standardize the data for training.

Artificial Neural Network Model Development:

1. Model architecture: Experiment with different ANN architectures including the feedforward neural networks with multiple hidden layers and backpropagation.
2. Hyperparameter tuning: Optimize variables like the number of hidden layers, neurons in each layer, and learning rates.
3. Regularization: Optimize further using regularization to avoid overfitting.
4. Cross-validation: Utilize cross-validation to ensure robust model performance.

Model Training: Split the data into training, validation and testing sets. Train the model using the training set. During training, tune hyperparameters using the validation sets and finally evaluate model performance using the testing set.

Model Evaluation: Assess model performance using accuracy, precision, recall, and F1-score metrics along with cross-validated results for effective waste classification.

Expected Outcomes: The expected outcomes encompass a deep understanding of Artificial Neural Network architectures, effective hyperparameter tuning, enhanced model generalization through regularization, robust performance via cross-validation, improved feature identification, accurate evaluation metrics, continuous accuracy enhancement, and actionable insights for informed customer retention strategies in the context of predicting customer churn.

Data Sources: https://www.kaggle.com/blastchar/telco-customer-churn