CCS 247 – MIDTERM PRACTICAL EXAM

General Instructions: Read and follow the instructions for the tasks to be performed. This practical exam will be worked on in pairs. You may view your notes and sample notebooks from the previous discussions. A Google Drive link will be provided later for the submission of outputs.

Predicting Telecom Churn using Naïve Bayes and Perceptron Classifiers

The churn rate, also known as the rate of attrition or customer churn, is the rate at which customers stop doing business with an entity. It is most expressed as the percentage of service subscribers who discontinue their subscriptions within a given period.

The objective of this activity is to predict telecom churn using the Naive Bayes and Perceptron classifiers from Scikit Learn.

Using the Dataset provided, perform the following tasks:

Naive Bayes Classifier:

- Implement a Naive Bayes classifier using the Gaussian Naive Bayes algorithm. (5pts)
- Train the model using the training dataset. (5pts)
- Evaluate the model's performance on the testing dataset using appropriate metrics such as accuracy, precision, recall, and F1-score. (5pts)

Perceptron Algorithm:

- Implement a Perceptron classifier. (5pts)
- Train the Perceptron model using the training dataset. (5pts)
- Evaluate the model's performance on the testing dataset using the same metrics as above. (5pts)

Comparison and Analysis:

- Compare the performance of the Naive Bayes classifier and the Perceptron classifier. (5pts)
- Analyze the strengths and weaknesses of each algorithm in the context of telecom churn prediction. (10pts)
- Discuss any observations regarding the performance difference between the two algorithms. (10pts)

Bonus:

- Create a confusion matrix to plot the prediction results for one of the classifiers. (5pts)