CHRIST (Deemed to be University)
Department of Computer Science
Master of Artificial Intelligence and Machine Learning

Course: MAI371 – Deep Learning
Exercise No: LAB Exercise – 2
Date: 23 – 02 – 2024
Duration: 2 Hrs

Question (10 Marks)

1.You are working for a financial institution that is concerned about fraudulent transactions on its credit card platform. Your task is to develop a predictive model using Multilayer Perceptrons (MLPs) with Keras/TensorFlow to detect fraudulent transactions based on transaction features.

Dataset Description:

You are provided with a dataset containing anonymized features of credit card transactions, including:

- Transaction amount
- Time of transaction
- Type of transaction (e.g., online, in-store)
- Merchant category code
- Other transaction-related features
- Label indicating whether the transaction is fraudulent or not (binary classification)

Model Development:

Design an MLP model architecture using Keras/TensorFlow to classify credit card transactions as fraudulent or not. Consider appropriate activation functions, number of layers, and neurons in each layer.

Data Preprocessing:

Before training the model, perform necessary preprocessing steps such as:

- Scaling numerical features
- Handling missing values
- Encoding categorical features
- Splitting the dataset into training and testing sets

Model Training:

Train the MLP model on the training set and tune hyperparameters if necessary to achieve better performance. Experiment with two different optimization algorithms and learning rates to optimize model convergence.

Evaluation and Validation:

Evaluate the trained model using appropriate evaluation metrics (e.g., accuracy, precision, recall, F1-score, ROC-AUC) on the testing set. Analyze the confusion matrix and precision-recall curve to understand the trade-offs between true positives and false positives in fraud detection.

Note: Download the datasets from the authorized sources

Evaluation Rubrics:

Model Accuracy and Appropriate activation function :3 marks
Implementation of Optimization Algorithm:5 marks
Visualization:2 marks

Total:10 Marks

General Instruction:

1. Ensure that your code includes relevant comments to enhance readability and understanding. Subsequently, upload your code to GitHub for version control and collaborative access.
2. Include descriptive comments within the code, explaining its functionality and logic.
3. In the Google Classroom submission, include the GitHub URL where your code is hosted.
4. Attach a PDF document named "your_register_number_exercise_No.pdf" to the submission.The PDF document should include screenshots of the code and the output screen.
5. Upload the answer document&GitHub URL in Google Classroom on or before the deadline mentioned.Evaluation will not be considered for late submission