National University

Of Computer and Emerging Sciences

AL2002 – Artificial Intelligence Lab

Lab Task # 10

Note:

- Plagiarism will not be **tolerated!!**
- Use comments wherever applicable.
- Please ensure to submit both a **PDF document** and a **Python file** containing your code on the classroom platform.

Problem: 1 - Predicting Who Survived the Titanic Using Multilayer Perceptron (MLP)

Goal

You are tasked with building a predictive model to determine the survival of passengers aboard the Titanic. Follow the steps below to accomplish this task:

1. **Data Preprocessing:**
    - Load the Titanic dataset (**titanic.csv**).
    - Preprocess the dataset by handling missing values and removing unnecessary columns.
    - Convert categorical data into numeric format using techniques like one-hot encoding or label encoding.
2. **Normalization:**
    - If necessary, normalize the numeric features to ensure that they are on a similar scale.
3. **Model Training:**
    - Train a predictive model using both scikit-learn and Keras with the following parameters:
        - Model: MLP for scikit-learn, and deep neural networks with different numbers of hidden layers and units for Keras.
        - Use the same parameters for the sklearn and keras models and vary the parameters (number of hidden layers and units) for the neural networks.
        - Split the dataset into training and testing sets (e.g., 80% training, 20% testing).
        - Train the models on the training data.
4. **Accuracy Calculation:**
    - Calculate the accuracy of all models on the testing set.
    - Plot a bar graph to visually compare the accuracies of different neural network architectures of models.

Your submission should include the following:

- Python code implementing the steps outlined above.
- Comments explaining each step and the rationale behind your choices.