



## NATIONAL UNIVERSITY OF COMPUTER & EMERGING SCIENCES FAST - PESHAWAR CAMPUS

**Subject:** AL 2002 - Artificial Intelligence Lab

**Instructor:** Muhammad Saood Sarwar

### Lab Task: Multilayer Perceptron (MLP)

## Problem 1: Predicting Housing Prices Using Multilayer Perceptron (MLP)

You are tasked with building a predictive model to determine housing prices based on the Boston Housing dataset. Follow the steps below to accomplish this task:

### 1. Data Preprocessing:

- Load the Boston Housing dataset (`boston.csv`).
- Handle missing values and remove unnecessary columns.
- Normalize the numeric features to ensure they are on a similar scale.

### 2. Model Training:

- Train predictive models using `Keras` and `TensorFlow`.
- Use the Multilayer Perceptron (MLP) model with `Keras`, implementing deep neural networks with varying numbers of hidden layers and units.
- Ensure consistent parameters for the `Keras` model, then vary the number of hidden layers and units to experiment with different architectures.
- Split the dataset into training and testing sets (e.g., 80% training and 20% testing).
- Train the models on the training set using `Keras` and `TensorFlow`.

### 3. Accuracy Calculation:

- Evaluate all models by calculating Mean Squared Error (MSE) on the testing set.
- Plot a bar graph to visually compare the performance of different neural network architectures.

**Your submission should include:**

- Complete Python code implementing the steps above using **Keras** and **TensorFlow**.
- Comments in the code explaining each step and the rationale behind your choices.