

**COMSATS University Islamabad, Lahore Campus**  
**Department of Electrical and Computer Engineering**  
**M. A. Jinnah Campus, Lahore.**

**CSC462 – Artificial Intelligence**

**Total Marks 20**

**Assignment 1**

**Resource Person:** Dr. Muhammad Farooq-i-Azam

**Problem 1** **(20)**

- (a) Write pseudocode to describe the simple linear regression learning algorithm.
- (b) Write a Python program that implements the simple linear regression algorithm according to your pseudocode.
- (c) Test your implementation using the attached dataset, SalaryData.csv. The dataset has two features i.e. Years of Experience and Salary. Split the dataset into training and test datasets using 70:30 ratio. Train your simple linear regression model using the training set. Next evaluate the performance of the model using the test set. Use root mean square error (RMSE), mean absolute error (MAE) and R2 score as the performance metrics.
- (d) Now use the LinearRegression builtin module from the sklearn library to train the linear regression model and evaluate its performance using RMSE, MAE and R2 score. You can extend the program in part (c) for this purpose.
- (e) Print the coefficients calculated by your own implemented model and those calculated by the builtin LinearRegression model.
- (f) Plot the scatter plot and the regression line obtained from your trained model.
- (g) Plot the scatter plot and the regression line obtained from the LinearRegression module of sklearn.

Submit your work in a compressed .ZIP file on CUonline. DO NOT use compression technique other than ZIP. The ZIP file should contain the following:

- (a) A .docx file containing (i) the pseudo-code (ii) scatter plot and regression line of your implemented model (iii) scatter plot and regression line of the built-in model (iv) a table that lists the coefficients calculated by your implemented model and those calculated by the built-in model.
- (b) The python program.

Copied work will be penalized and may be awarded zero marks.