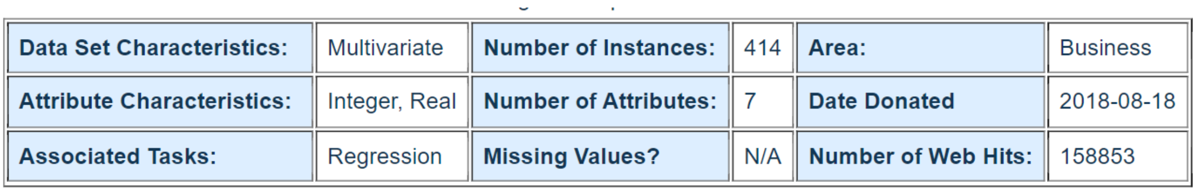
School of Computer Science Engineering and Technology

Lab Assignment No. 5.1

Exp. No.	Name	CO-1	CO-2	CO-3
3.1_1	Simple Linear regression	✓	✓	

Objective: To implement Simple Linear regression model using scikit-learn library.

About Dataset: The market historical data set of real estate valuation are collected from Sindian Dist., New Taipei City, Taiwan.



Data Set Characteristics:	Multivariate	**Number of Instances:**	414	**Area:**	Business
Attribute Characteristics:	Integer, Real	**Number of Attributes:**	7	**Date Donated**	2018-08-18
Associated Tasks:	Regression	**Missing Values?**	N/A	**Number of Web Hits:**	158853

Attribute Information:

X1=the transaction date (for example, 2013.250=2013 March, 2013.500=2013 June, etc.)

X2=the house age (unit: year)

X3=the distance to the nearest MRT station (unit: meter)

X4=the number of convenience stores in the living circle on foot (integer)

X5=the geographic coordinate, latitude. (unit: degree)

X6=the geographic coordinate, longitude. (unit: degree)

Y= house price of unit area (10000 New Taiwan Dollar/Ping, where Ping is a local unit, 1 Ping = 3.3 meter squared)

Download the dataset available on: (https://archive.ics.uci.edu/ml/datasets/Real+estate+valuation+data+set)

1. Load dataset into Pandas Data Frame
2. Display the first 5 rows
3. Remove the columns X1 “The house age”
4. Check whether data contains missing value or not. if require, pre-process the data.
5. Read and store the features “X2=the house age” of data in X and output variable in Y “house price of unit area”.

6. Split the dataset into train and test in the following ratio (Hint: Use train_test_split class, use Splitting ration 80:20)
7. Create Linear Regression Models on the splitting criterion as mentioned above (Hint: Use sklearn.linear_model.LinearRegression class)
8. Find out the linear regression coefficients (i.e., m and c)
9. Write the equation of SLR
10. Perform the prediction on the test dataset.
11. Check the performance of the model on test dataset by Calculating the ‘Mean Squared Error' (MSE) and r2_score (Hint: sklearn.metrics.mean_squared_error function)
12. Plot the regression line for test dataset (i.e., Y_pred vs Y_actual)
    (Hint: Use scatter plot and line plot of Matplotlib Library)
13. Train the model against different features like X3 vs Y, X4 vs Y, X5 vs Y and X6 vs Y and Identify the most desirable feature for the dependent variable Y

Suggested Platform: Jupyter Notebook/Google Colab Notebook
Packages: numPy, Pandas, sklearn, matplotlib.pyplot