School of Computer Science Engineering and Technology

Course- BTech
Course Code- CSEL301
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Batch- 5th Sem

2 - Lab Assignment No. 2.2_2

Objective: To implement Simple Linear regression model from scratch i.e., without using inbuilt library.

Exp. No.	Name	CO-1	CO-2	CO-3
2.2_2	Scratch Linear Regression	✓	✓	--

Download the dataset available on: (https://www.kaggle.com/datasets/jemishdonda/headbrain).
The dataset consists of 4 attributes (Gender, Age Range, Head Size(cm^3) and Weight(grams)). (5)

1. Read the dataset (use read_csv() from pandas) into some variable. Take the last two columns (Head Size(cm^3) and Brain Weight(grams)) into XY. (10)
2. Print the different statistical values of data contained in XY using describe () function from pandas. (5)
3. Divide XY into X consisting of Head Size (cm^3) and Y consisting of Brain Weight(grams). Print the shape of both. (5)
4. Calculate the mean of X and Y. (5)
5. Complete the following functions given in the provided Ipython Notebook to implement a Linear Regression model between X and Y (Y = b0 + b1*X). (60)
    - Write code to calculate the value of b1 and b0.
    - Write code to find the Regression line Y= b0 + b1*X.
    - Display the regression line with Scatter plot (Head Size(cm^3) in X-axis and Brain Weight (grams) in Y-axis).
    - Write code to calculate the Root Mean Square Error (**RMSE**).
    - Calculate the amount of the variation in the output dependent attribute which is predictable from the input independent variable using **R2** score.

Note: Do not use in-build library for linear regression problem discussed in this lab.

Suggested Platform: Jupyter Notebook/Google Colab Notebook, packages such as numPy, Pandas, matplotlib.pyplot.