Programme	:	B.Tech (AI and ML)	Semester	:	WS 2021-22
Course	:	Machine Learning Essentials	Code	:	CSE 1015
Faculty	:	Dr. R. Rajalakshmi	Slot	:	L23 + L24

Challenging Experiment

Date: 03.03.2022

Consider the given dataset, apply a suitable algorithm to design a 2-stage classifier to predict z1.

Stage-1 classifier: Inputs: x1, x2 x3 **and** Output: y2
Stage-2 classifier: Input: y2 **and** Output: z1

1. Normalize the values. Mention the normalization method followed.
2. Stage-1: Find the correlation between
   a. the explanatory variables (x1, x2 and x3)
   b. the explanatory variables and the response variable (y2)
   c. List out those variable names.
   d. Present the inference graphically (like scatter plot etc...) and explain.
3. Stage-2: Find the correlation between
   a. the explanatory variables and individual response variables (z1)
   b. List out those variable names.
   c. Present the inference graphically (like scatter plot etc...) and explain.
4. Apply suitable regression technique (Simple Linear, Lasso, Ridge and ElasticNet)
5. **Which regression model is suitable for this dataset and why? Write the obtained regression equation. (for both Stage1 and Stage 2 separately).**
6. Compare all the regression models in terms of the following performance metrics
   i) Mean Absolute Error
   ii) Mean Square Error
   iii) Root Mean Square Error
   iv) R-Squared
   v) Adjusted R-squared.
7. Summarize and tabulate the result of every regression method chosen by you.

S. No	Regression	MSE	MAE	RMSE	R-Squared	Adjusted R-Squared

8. Present the inference with necessary graphs and report the best model.