PML_LR-A1

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1. **Diabetes Dataset**
    - Predict the progression of diabetes (Y) using features such as bmi, age, and bp. Evaluate model performance using RMSE, MSE, and MAE.
2. **California Housing Dataset**
    - Predict the median house value (MedHouseVal) using features like AveRooms, HouseAge, and AveOccup. Visualize actual vs. predicted values for each model.
3. **Iris Dataset**
    - Predict petal width using features such as sepal length, sepal width, and petal length. Use all regression techniques and compare their R^2 values.
4. **Wine Dataset**
    - Predict alcohol content using features like malic_acid, magnesium, and flavanoids. Highlight which regression model performs best.
5. **Breast Cancer Dataset**
    - Predict the mean radius of tumors using features such as mean texture, mean perimeter, and mean area. Compare the performance of Linear Regression and Ridge.
6. **Linnerud Dataset**
    - Use the Linnerud dataset to predict chins using features such as age, weight, and waist. Compare MSE and MAE for each regression model.
7. **Custom Regression Dataset (make_regression)**
    - Generate a synthetic dataset with 10 features and evaluate regression models for RMSE and R^2.
8. **Digits Dataset**
    - Use the Digits dataset to predict one of the pixel intensities from other pixel values. Compare all regression models for their performance.
9. **Load Fish Dataset**
    - Predict the weight of a fish using features like length, width, and height. Highlight which regularization method minimizes RMSE.
10. **Kaggle Titanic Dataset**
    - Predict the fare of passengers using features like age, pclass, and sibsp. Evaluate using Ridge and ElasticNet regression.
11. **House Prices Dataset**
    - Predict the sale price of houses using features like GrLivArea, GarageArea, and YearBuilt. Visualize actual vs. predicted values.
12. **Air Quality Dataset**
    - Predict ozone levels using features such as temperature, wind speed, and solar radiation. Evaluate metrics like MSE and R^2.
13. **Forest Fires Dataset**
    - Predict the area burned in a forest fire using weather and location features. Compare Lasso and ElasticNet regression results.
14. **Student Performance Dataset**

- Predict final grades using features like study time, previous scores, and absences. Evaluate RMSE and MAE for each regression model.

15. **Auto MPG Dataset**
    - Predict the miles per gallon (MPG) of cars using features like horsepower, weight, and displacement. Compare the regularization techniques.
16. **Concrete Strength Dataset**
    - Predict concrete strength using features like water, cement, and fine aggregate. Visualize feature importance in Ridge and Lasso.
17. **Energy Efficiency Dataset**
    - Predict the cooling load of buildings using features like surface area, wall area, and roof area. Evaluate the performance of ElasticNet regression.
18. **Insurance Premium Dataset**
    - Predict the insurance charges using features like age, BMI, and number of children. Highlight R^2 and MSE values.
19. **Crime Rate Dataset**
    - Predict crime rates using features such as population, unemployment rate, and police funding. Compare the results of Ridge and ElasticNet.