

Task1:- Optimizing Regression Model Performance

1. Task Description:

Apply lasso in dataset(<https://www.kaggle.com/datasets/nishathakkar/100-sales>) and calculate MSE,MAE,RMSE and its value should be minimum value come in range(0.111 or 1-12).

2. Task Output Screenshot:

```
# Print results
print("Lasso Regression (Poly) - MSE: {:.6f}, RMSE: {:.6f}, MAE: {:.6f}".format(lasso_mse, lasso_rmse, lasso_mae))
```

```
Lasso Regression (Poly) - MSE: 0.189604, RMSE: 0.435435, MAE: 0.266815
```

```
# Print best hyperparameters
print("Best Lasso alpha:", best_lasso.named_steps['lasso'].alpha)
```

```
Best Lasso alpha: 0.001
```

```
# Convert log-scale RMSE back to original scale
```

```
def rmse_to_original_scale(rmse):
    return np.sqrt(np.expml(rmse**2))
```

```
print("\nRMSE values in original scale:")
```

```
print("Lasso Regression (Poly):", rmse_to_original_scale(lasso_rmse))
```

```
RMSE values in original scale:
```

```
Lasso Regression (Poly): 0.4569142670560878
```

3. Algorithm Used In Task:

- Sklearn library is used for model selection to import train_test_split(to split data) and GridSearchCV.
- For preprocessing, I import StandardScaler and PolynomialFeatures.
- Import Lasso, by calling sklearn.linear_model.
- Import mean_squared_error and mean_absolute_error for evaluation.