

Experiment-3 Ouputs

Kamalesh N 24BAD054

SCENARIO 1

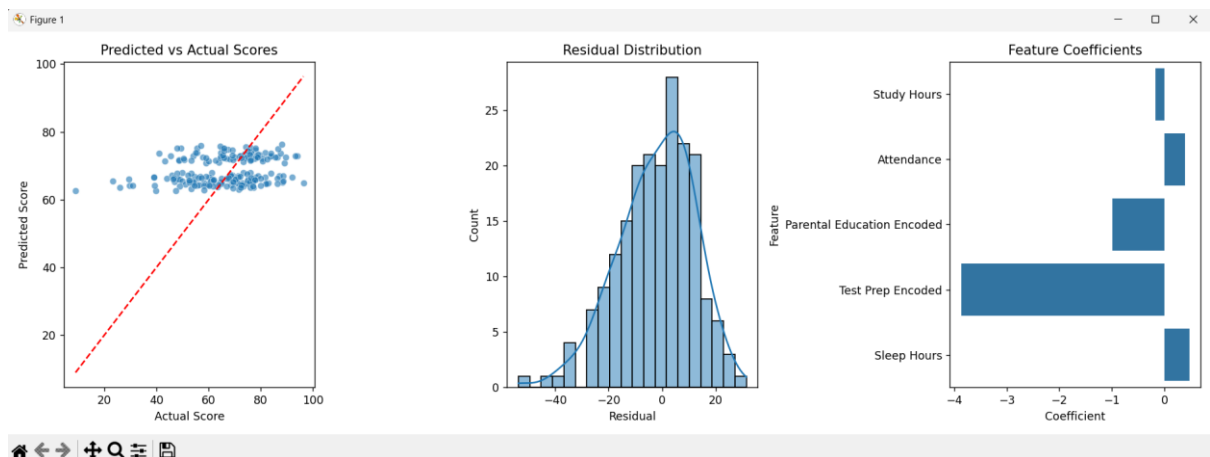
```
Problems Output Debug Console Terminal Ports
PS C:\Users\kamal\Downloads> & C:/Users/kamal/AppData/Local/Programs/Python/Python312/python.exe c
:/Users/kamal/Downloads/ML_Lab_Scenario_1_Multilinear.py
Student Name: Kamalesh N
Roll Number: 24BAD054
-----
Dataset loaded successfully.
Added synthetic features: Study Hours, Attendance, Sleep Hours
Computed Target Variable: Final Score
No missing values found in input features.

--- Model Performance (Linear Regression) ---
MSE: 207.7921
RMSE: 14.4150
R2 Score: 0.0307

--- Coefficient Analysis ---
Ln 11, Col 32, Spa
```

```
Problems Output Debug Console Terminal Ports
--- Model Performance (Linear Regression) ---
MSE: 207.7921
RMSE: 14.4150
R2 Score: 0.0307

--- Coefficient Analysis ---
      Feature  Coefficient
0      Study Hours  -0.171371
1      Attendance   0.389401
2 Parental Education Encoded -0.984556
3      Test Prep Encoded -3.861227
4      Sleep Hours   0.472210
Ridge Regression R2: 0.0307
Lasso Regression R2: 0.0312
Visualization saved as scenario_1_plots.png
PS C:\Users\kamal\Downloads>
```



SCENARIO 2

```
PS C:\Users\kamal\Downloads> & C:/Users/kamal/AppData/Local/Programs/Python/Python312/python.exe c
:/Users/kamal/Downloads/Untitled-1.py
Kamalesh N
Roll Number: 24BAD054
-----
   mpg  cylinders  displacement  ... model year  origin  car name
0  18.0         8         307.0  ...      70      1  chevrolet chevelle malibu
1  15.0         8         350.0  ...      70      1      buick skylark 320
2  18.0         8         318.0  ...      70      1  plymouth satellite
3  16.0         8         304.0  ...      70      1      amc rebel sst
4  17.0         8         302.0  ...      70      1      ford torino

[5 rows x 9 columns]
c:\Users\kamal\Downloads\Untitled-1.py:17: FutureWarning: A value is trying to be set on a copy of
a DataFrame or Series through chained assignment using an inplace method.
The behavior will change in pandas 3.0. This inplace method will never work because the intermedia
te object on which we are setting values always behaves as a copy.

df['horsepower'].fillna(df['horsepower'].mean(), inplace=True)

Polynomial Degree: 2
Train MSE: 21.68
Test MSE: 13.76
RMSE: 3.71
R2 Score: 0.74

Polynomial Degree: 3
Train MSE: 21.64
Test MSE: 13.81
RMSE: 3.72
R2 Score: 0.74

Polynomial Degree: 4
Train MSE: 21.54
```

