MINE AUTOMATION AND DATA ANALYTICS PROJECT

DATA SITE LINK:
https://www.eia.gov/coal/data.php

PREDICTING COAL PRODUCTION LEVEL

A comprehensive study for predicting coal production levels based on 2021 production data of USA

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Objective and Aim

1) To develop a multivariate regression model that accurately predicts coal production in the United States based on the independent variables of average employees, labor hours, and mine type.

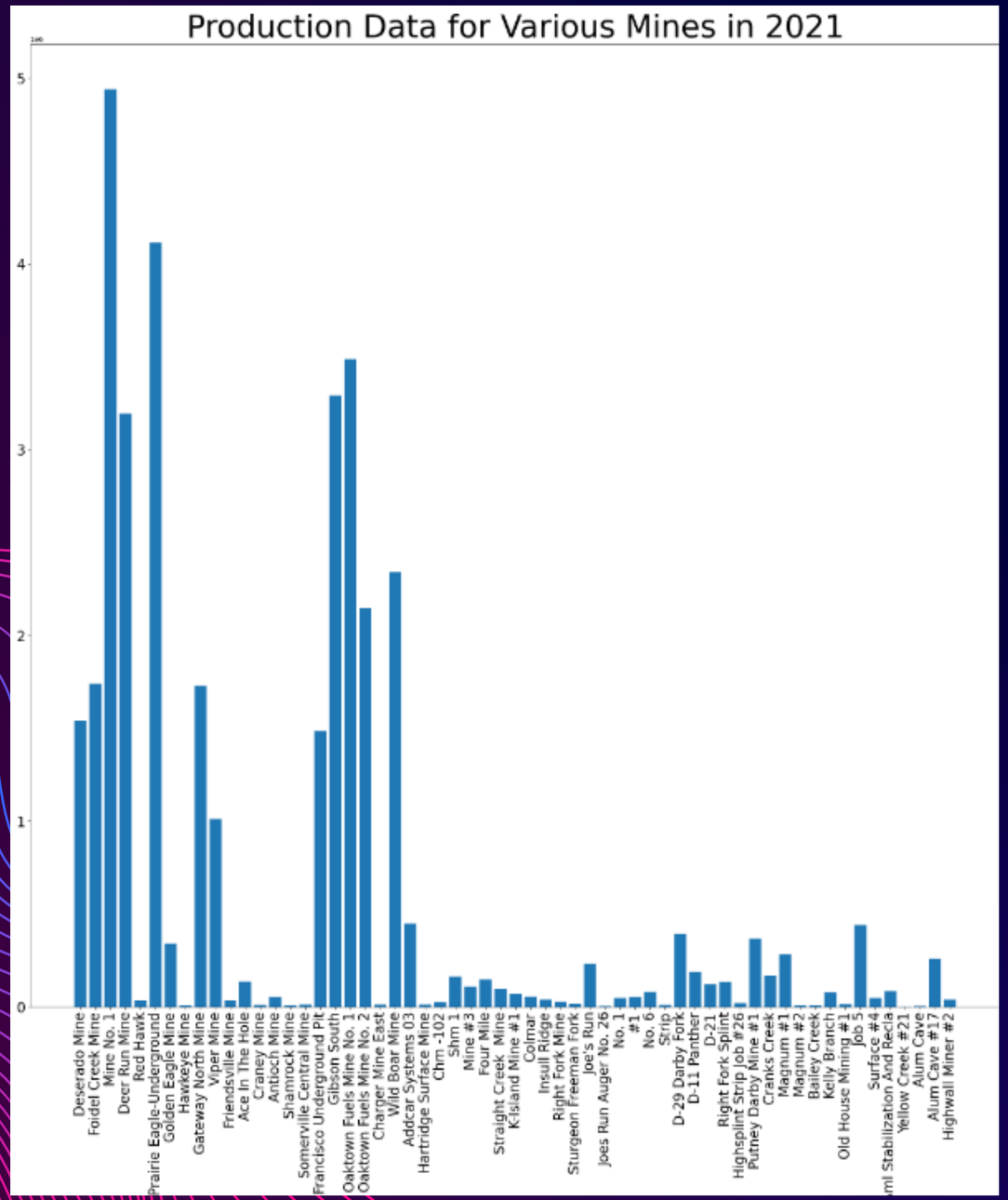
2) To identify the most significant independent variable among the three, and determine its relative impact on the dependent variable.

3) To provide insights into the relationship between the independent and dependent variables, and to assess the effectiveness of the model in predicting coal production.

	Year	Mine Name	Mine State	Mine Type	Production (short tons)	Average Employees	Labor Hours
0	2021	John Poe Mine	Alabama	Surface	6,487	2	820
1	2021	Flat Top Mine	Alabama	Surface	2,03,190	42	1,17,312
2	2021	Oak Grove Mine	Alabama	Underground	20,20,277	461	11,00,028
3	2021	No 7 Mine	Alabama	Underground	47,93,699	514	15,02,426
4	2021	Narley Mine	Alabama	Surface	130	3	2,757
5	2021	Maxine-Pratt Mine	Alabama	Underground	96,907	27	53,479

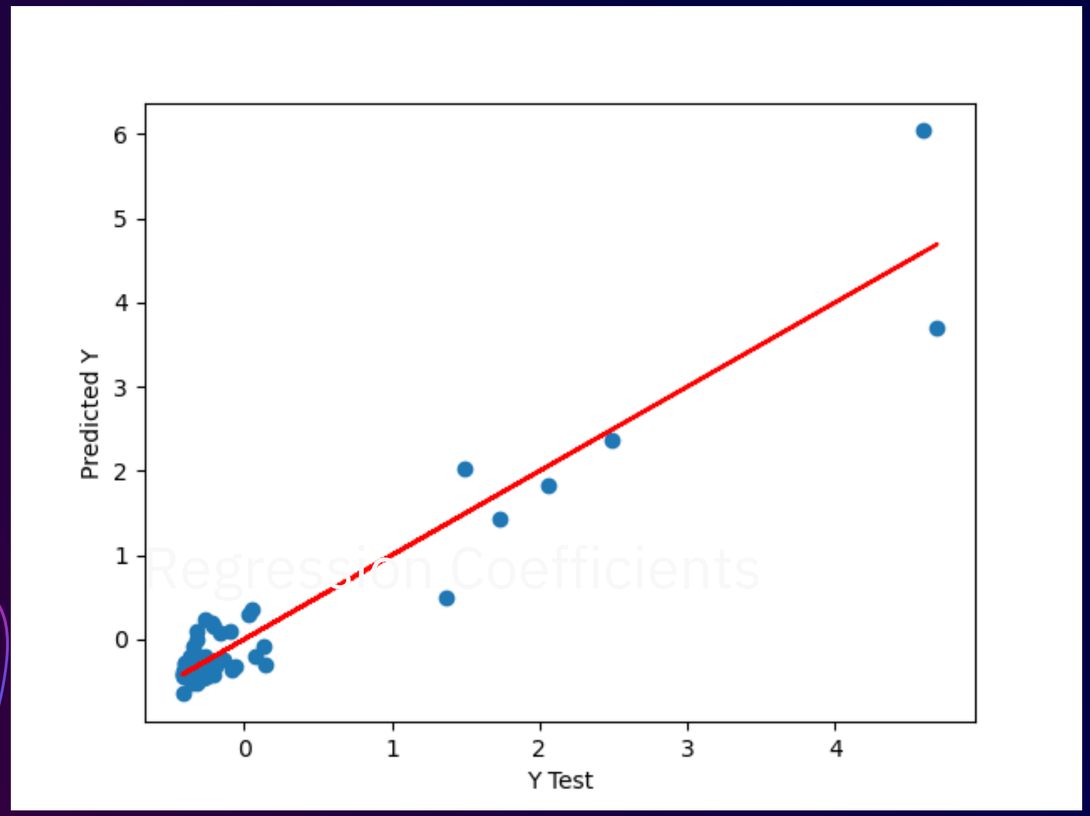
A GLIMPSE INTO DATA SET

DATA VISUALISATION AND OBSERVATION



The heatmap reveals that the relationship between coal production and the number of average employees and labor hours is positively correlated, whereas mine type shows a weak correlation with coal production.

RESULTS AND CONCLUSION



Actual v/s predicted Values

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MAE: 0.2031256199052605
MSE: 0.1042784721193581 5
RMSE: 0.3229217739938856
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Errors

The coefficient for average employees was positive, indicating that an increase in the number of employees is associated with an increase in coal production.

The coefficient for average employees was particularly high, indicating that the number of average employees has a significant impact on coal production.

The coefficient for labor hours was negative, indicating that an increase in labor hours above the optimum level is associated with a little decrease in coal production.

	Coeffecient
Average Employees	0.907769
Labor Hours	-0.165801
Mine Type	-0.221665