

MULTIPLE LINEAR REGRESSION (MLR)

MLR is a statistical technique for finding the relationship b/w a dependent variable and multiple independent variable.

The equation for MLR is :

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n$$

For building an optimal model using MLR, the Backward Elimination Algorithm is used.

STEPS

- (i) Select a Significance Level to stay in the model
(~~SL~~) (SL = 0.05)
- (ii) Fill the model, with all possible predictors.
- (iii) Consider the predictor with the highest P value
~~if~~ $P > SL$, go to step iv, else finish.
- (iv) Remove the Predictor.
- (v) Fit ~~on~~ model without this variable (predictor)
- ~~(vi)~~

eg:

▷ Predicting the impact of changes.

eg: How much does BP go up (down) for every unit

of increase (decrease) in the BMI of a patient.

Does revision time, test anxiety, lecture attention, and gender have any effect on the exam performance of students.

The significance of MLR is to examine which variables are significant predictors of the outcome variable. It also signifies, how each feature impacts the outcome variable.

Polynomial Regression

The equation for polynomial linear regression is

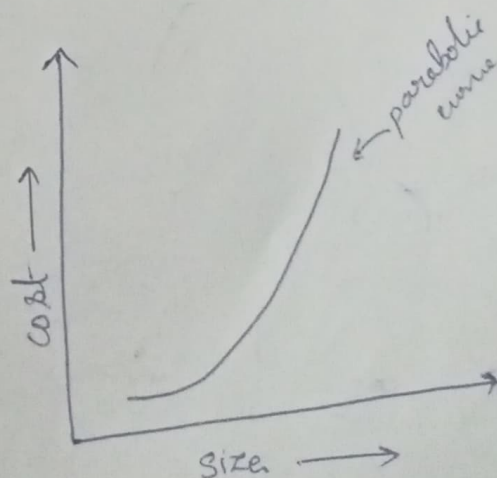
$$y = b_0 + b_1x_1 + b_2x_1^2 + \dots + b_nx_1^n$$

Here 'n' refers to the degree of the polynomial

The graph corresponding to polynomial linear regression is as follows

$$y_0 = b_0 + b_1x_1 + b_2x_1^2 + \dots + b_nx_1^n$$

8. The graph is a parabolic curve



9. House price prediction, i.e. the cost of house \uparrow or \downarrow as the size of house \uparrow or \downarrow .