Regression

Simple Linear Regression

Assignment 3

BP: Delivery\_time -> Build a prediction model for Churn\_out\_rate.

Do the necessary transformations for input variables for getting better R^2 value for the model prepared.

1. After observing the plot between delivery time vs sorting time, the plot is in a negative linear relationship.
2. Now r value is = - 0.911 and value of R2= 0.8312
3. First well known procedure is doing RMSE ( root mean square error ) for predicting the values .

Now finding the confidence interval   
using , confint(reg,level=0.95)

at 2.5% -> 181.2912317 - X (0.1388454)

At 95% -> 307.4385905- x(0.0642399)

and now we can get the predicted values in the interval using ,   
  
Predict ( reg , interval=”predict “)

fit lwr upr

1 83.92753 72.38391 95.47115

2 81.89668 70.59327 93.20009

3 80.88125 69.68123 92.08127

4 77.83497 66.87456 88.79538

5 75.80412 64.94216 86.66607

6 72.75784 61.94828 83.56740

7 71.13316 60.30425 81.96206

8 68.69613 57.77694 79.61533

9 61.58815 50.00746 73.16884

10 54.48016 41.72742 67.23290

Now we will try to transform the R2 values:

Now applying different methods,

The value before and after transformation are :

OUTPUT INPUT COR METHOD R2 RMSE

Churn-out rate Salary\_hike - 0.911 SLR 0.8312 3.9978

Churn-out rate log(salary hike) -0.9211 logarithmic 0.8466 3.78694

Log(churn-out rate) salary hike -0.9346 exponential 0.8735 3.541  
  
churnout rate sqrt( salary hike) -0.916 square root 0.84 3.89  
  
  
  
  
Therefor among all the four , considering for small change of value in RMSE we can consider exponential method as the best transformation among all.  
  
  
at 95% = -0.0009631923 +X( 7.3706828388)

At 2.5 % = -0.001829477 + X(5.905917079)

The predicted values for churn out rate are :

fit lwr upr

1 4.432091 4.298052 4.566130

2 4.404164 4.272914 4.535414

3 4.390201 4.260151 4.520250

4 4.348311 4.221044 4.475578

5 4.320384 4.194260 4.446508

6 4.278494 4.152978 4.404010

7 4.256153 4.130412 4.381893

8 4.222641 4.095852 4.349429

9 4.124897 3.990428 4.259367

10 4.027154 3.879075 4.175233