

Interpreting the Summary Output of the lm() Function

```
Call:
lm(formula = Sales ~ TV, data = data)

Residuals:
    Min       1Q   Median       3Q      Max
-8.3860 -1.9545 -0.1913  2.0671  7.2124

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  7.032594   0.457843   15.36  <2e-16 ***
TV           0.047537   0.002691   17.67  <2e-16 ***
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.259 on 198 degrees of freedom
Multiple R-squared:  0.6119,    Adjusted R-squared:  0.6099
F-statistic: 312.1 on 1 and 198 DF,  p-value: < 2.2e-16
```

- **Residuals** : Gives difference between the actual value of Y and the predicted value
- **Coefficients Estimate** : Intercept gives you the amount of change in y variable in absence of any predictors. The estimates for predictor variables give you the amount the target variable will increase on 1 unit increase in that particular predictor variable keeping others constant.
- **Pr(>|t|)** : This is the p-value. A smaller p-value allows us to reject the null hypothesis and establishes the fact that there is indeed a relationship between the target and predictor variables. Typical p-value cut-offs for rejecting the null hypothesis is 0.05. Asterisks mark aside p value define significance of value, lower the value have high significance. The more the no.of stars, the higher significance the p-value has.
- **Multiple R squared**: This provides a measure of how well our model fits the data. It denotes the amount of variation explained in the response variable. A value closer to 1 is considered a good R square value.
- **Adjusted R squared** : It is better to consider this value in case of multiple linear regression instead of R squared because as the no.of variables increase R square also increases even though the new model may not be that good a fit. Whereas adjusted R squared is a modification to R squared and doesn't always increase with increase in no.of variables and hence proves to be a better statistics to judge model performance.