

WHEN TO DO TRANSFORMATION?

- If there is a non-linear trend in the data, the first thing to do is transform the predictor values.
- When the problem is the non-normality of error terms and/or unequal variances are the problems, then consider transforming the response variable; this can also help with non-linearity.
- When the regression function is not linear and the error terms are not normal and have unequal variances, then transform both the response and the predictor.
- In short, generally:
 - Transforming the y values helps in handling issues with the error terms and may help with the non-linearity
 - Transforming the x values primarily corrects the non-linearity

NON-LINEAR REGRESSION

- Non-linear regression is a method to model a non-linear relationship between the dependent variable and a set of independent variables.
- For a model to be considered non-linear, predicted values must be a non-linear function of beta parameters and not necessarily of the predictors.
- In non-linear regression, a model is non-linear in parameters.
- The Ordinary Least Squares method can no longer be used to fit the data.

$$y_i = \frac{\beta_1}{1 + e^{(\beta_2 + \beta_3 x_i)}} + \epsilon_i$$