

# ASSIGNMENT 9

No. of customers

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 x_2 + \beta_4 x_1^2 + \beta_5 x_1^2 x_2$$

Interaction

Note:  $\beta_5 x_1^2 x_2$

$\beta_5$  (Temp)<sup>2</sup>. Day is Both

Quadratic

&

Interaction

Quadratic

## Partial F - Test :

$$F\text{-stat} = \frac{(RSS_{full} - RSS_{Reduced})/p}{MS_{full}}$$

Regression

Sum Squared

no. of predictors

removed from the Model

Residual

$$P\text{-value} = F\text{-DIST.RT}(F\text{-val}, df_{residual} - df_{Reduced}, df_{Reduced}, df_{residual})$$

# Run Global F-Test with all columns (Regression)

↓  
Remove Quadratics  $x_1^2$ ,  $x_1^2 x_2$  and Run reduced model with rest of col's.

↓  
Consider both Full & reduced model and run Partial F-Test  
(Use formula's above)

↓  
Basing P-value from Partial F-Test

↓  
if you reject Null ✓  
keep the quadratic (without interactions)  
Run one more reduced model with (Temp, day, Temp<sup>2</sup>)

↓  
Perform 2nd Partial F-Test with 2nd reduced and Full model

✓ if you fail to reject  
Eliminate the quadratics  
Re-run regression without quadratics  
Coincidentally, you already got that from 1st reduced model. Just look at t-stat and p-value of the interaction term

↓  
if you reject Null if fail to reject  
keep the interaction eliminate interaction  
+  
Run another regression with remaining variables

↓  
look at T-stat and p-values

↓  
if fail to reject Eliminate interaction  
↓  
Run another regression with remaining variables

↓  
look at t-stat and p-values



