**The Hypothesis**

For the case we have formed a hypothesis for the concern that there is a difference in

the level of complaints across the four regions. The null hypothesis is as follows:

*H0: There is a difference in the level of complaints across the four regions for the twelve*

*month period from Jan to Dec.*

**ANOVA**

For testing the hypothesis we have used ANOVA as the statistical method. The Analysis

of Variance (ANOVA) is a common statistical procedure which can handle a variety of

situations. This method is used when determining the difference in means of more than

two populations.

In the ANOVA test, the sum of squares, SST and SSE are used to form two mean

squares, one for treatments and second for error. These mean squares are denoted by

MST and MSE respectively. These are displayed in a tabular form (refer to Excel result

tab in the spreadsheet), in the ANOVA table.

When the null hypothesis of equal means is true, the two mean squares estimate the

same quantity and should approximately be of the same magnitude. Or, their ratio

should be 1. If null hypothesis is false, MST should be larger than MSE. The mean

squares are formed by dividing the sum of squares by the associated degrees of

freedom. The test that is used to measure the equality of treatment is F-test which is

given as F = MST/MSE.

**Interpretation of ANOVA Table**

The degrees of freedom are 3 (numerator), and 44 (denominator). The critical value for

the test is 0.05. The test statistic is the F-value of 0.472. Using the F-value of 0.472 and

degrees of freedom as 3 and 44, we have that p-value for the set of data is 0.7033.

Since this value is much larger than the critical value, we reject the null hypothesis of

having different complaint level across four regions and conclude that there is no

significant difference in the level of complaints across the four regions.