**Chapter 11:**

**ANOVA:**

**Two-Way ANOVA:**

Assume we have two factors affect on a response variable Y. these two factors with no interactions which means that the effect of a particular level of one factor does not depend on what level of the other factor is used. The first factor A has I levels and the second factor B contains J levels.

If we are interested in one of the factors say A (called treatments), and not interested in the other factor B (called blocks). Thus, we use the blocks to improve the accuracy of the experiment by making sure that any differences found in treatments are not really due to differences in the blocks. So we have only one test for treatments.

**The Two-Way ANOVA table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source of Variation** |  | **SS** | **MS** |  |
| **Factor A** | I-1 |  |  |  |
| **Factor B** | J-1 |  |  |  |
| **Error** | (I-1)(J-1) |  |  |  |
| **Total** | IJ-1 |  |  |  |

**First: The Steps Of the test of factor A:**

1. **Hypotheses:**

**This is equivalent to**

1. **Test Statistic:**
2. **Rejection Region:**

Reject if:

**Second: The Steps Of the test of factor B:**

1. **Hypotheses:**

**This is equivalent to**

1. **Test Statistic:**
2. **Rejection Region:**

Reject if: