**Fun with Levene’s Test for Homogeneity of Variance**

**Sample and Population Notation for Means and Variances**

**Example:** A completely randomized design was used to compare the yield of four varieties of rice. The yield is recorded in pounds per acre. See text for complete details.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | | **Sample** | | | **Population** | | |
| **Variety** | **Yields** | | | | **Mean** | **Variance** | | **Mean** | **Variance** | |
| 1 | 934 | 1041 | 1028 | 935 |  | |  |  | |  |
| 2 | 880 | 963 | 924 | 946 |  | |  |  | |  |
| 3 | 987 | 951 | 976 | 840 |  | |  |  | |  |
| 4 | 992 | 1143 | 1140 | 1191 |  | |  |  | |  |

**Levene’s Test for Equal Variance**

NOTE: Our text refers to this test as the BFL (Brown-Forsythe-Levene) test. See pages 382-385.

What are some advantages of Levene’s Test?

**Hypotheses:** We are testing the equality of the factor-level population variances:

**Test Statistic:**  with numerator df and denominator df

**p-value:** We will use the observed *p*-value to reach a conclusion about the null hypothesis and compare it to the significance level of the test (usually ).

**Decision:** Always pertains to the null hypothesis. We either Reject or Fail to Reject .

**Conclusion or Interpretation:** Put the results of our hypothesis test in the context of the problem or scenario

**Practice:**

> leveneTest(Yield~variety.factor,data=dataobj)

Levene's Test for Homogeneity of Variance (center = median)

Df F value Pr(>F)

group 3 0.2487 0.8607

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