Exploring Assumptions - Seminar 2

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MATH 567 - Winter 2016

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A number of standard tests have been developed to test **variance** of given data sets.

1 Shapiro-Wilk test

The Shapiro-Wilk test, proposed in 1965, calculates a W statistic that tests whether a random sample, $x_1, x_2, \ldots, x_n$ comes from (specifically) a normal distribution.

2 Levene's test

Levene's test, proposed in 1960 is used to test if k samples have equal variances. Equal variances across samples is called **homogeneity** of variance. Some statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The Levene test can be used to verify that assumption.

3 Hartley's test

Hartley's F_{max}, is used in the analysis of variance to verify that different groups have a similar variance, an assumption needed for other statistical tests.

4 Data file

A data file named `Seminar_2.csv` is provided. It has two columns of 5000 data points. Using the three tests, develop relevant R routines to **analyze** the two data sets.

5 Assignment

5.1 Task 1

Do a background research on the three different tests and present a half page report on each of the following:

1. Mathematical description,
2. Areas of application,
3. Analyze the given data sets.

6 Submission

A half page report of each of the three different tests. A separate report in conjunction with the appropriate R script file analyzing the two different data sets.

The deadline for submission is February 1, 2016 at 5PM.