Randomization Testing in JMP Pro

This page provides information on randomization testing, which is a re-sampling approach to significance testing. Randomization testing is also known as Permutation testing. Randomization Testing is available from all JMP Pro 13 analysis reports.

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Here, we describe how to conduct a randomization test for two means using Fit Y by X.

1. From an open JMP data table, right-click on the column header for the Nominal X variable (in this example, sex) and select New Formula Column > Random > Sample With Replacement.

   This creates a new formula column, Resample[sex].

2. Conduct a 2-Sample t-Test.

   For this example, the Y, Response is Weight and the X, Factor is sex. See the page Two Sample t-Tests and CIs for information on how to conduct this test and interpret results.

3. In the analysis report window, right-click over the statistic of interest and select Simulate. Here we right-click on the column of output containing the Difference (between means).

4. In the Simulation window, select the column to switch out (sex) and the column to switch in (Resample[sex]), enter the desired number of samples (1000, in this example), and the random seed (if desired), and click OK.

   JMP re-runs the analysis for each sample. For each iteration, the values of the X, Factor (sex) are resampled with replacement.

   The results are stored in a data table with statistics for the original sample and each of the resamples. The SimID• column identifies the resample number.

5. Use the Distribution platform to explore the results for the statistics of interest. Confidence intervals for the original estimate (the Difference, in this example) are provided, along with empirical (observed) p-values.

   Interpretation: The empirical p-value for the two-tailed test is 0.3193. Roughly 31.9% of the observed resampled differences were as extreme or more extreme than the difference we actually observed (7.37).

Notes: The Randomization Testing Add-in on the JMP User Community (community.jmp.com) provides interactive randomization testing for common hypothesis tests in JMP. For more details on resampling in JMP Pro, search for Simulate in the JMP Help or in the book Basic Analysis (under Help > Books).