

Student's t-test for Independent Samples

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2026-02-10

Student's t -test evaluates whether two samples are statistically different. For independent samples the test is solved by the equations below.

1 Equation:

$$t = \frac{y_1 - y_2}{\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right) s^2}}$$

Where:

- y_1 = mean of the values in the first dataset;
- y_2 = mean of the values in the second dataset;
- s^2 = pooled variance.

The pooled variance is given by:

$$s^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

2 Files:

1. Program
2. Source code
3. This tutorial

3 Usage and example

1. Enter a matrix containing the two datasets;
2. Run `"testt1matrix"`.

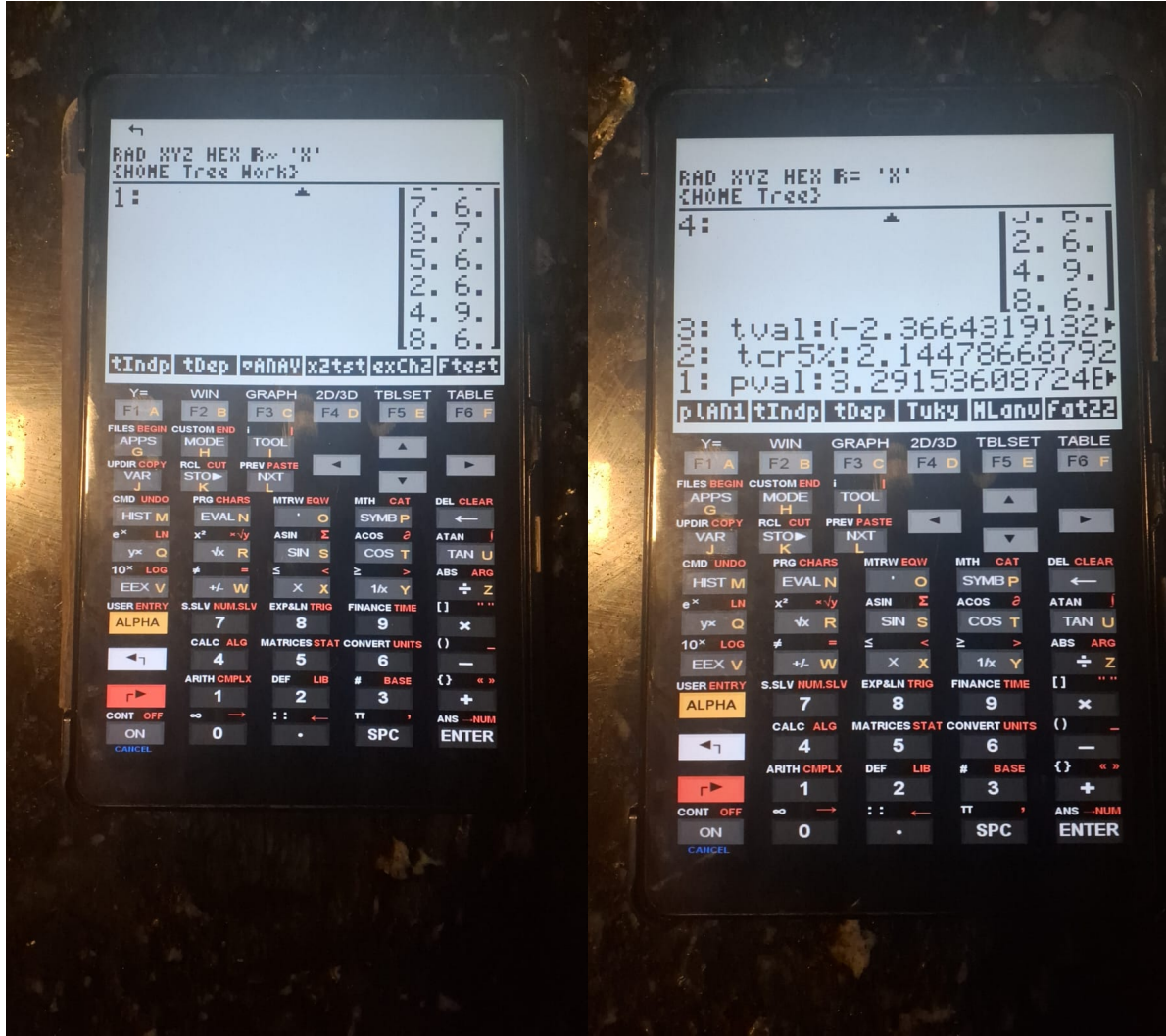
Output:

1. `"tval"` - `*t*` statistic;
2. `"tcr5%"` - tabulated critical `*t*` value;
3. `"pval"` - `*p*`-value of the test.

Table — Observed values for groups A and B (Vieira, 2000).

Group								
A	6	5	7	3	5	2	4	8
B	7	9	6	7	6	6	9	6

The results are consistent with those reported by Vieira (2000), with $tval = -2.366$ and $pval = 0.036$.



(a) Insertion of data matrix.

(b) Results obtained from the t-test.

Figure 1: `testt1matrix` program running on the Android version of the HP50G calculator (Go49g), showing data input and results for the example.

4 References:

1. Vieira, Sônia. *Analysis of Variance: ANOVA*. Atlas Publishing, 2000.

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