

NOTE X: SUPPORT IN EXCEL FOR TESTS OF SIGNIFICANCE

A SURVEY OF TEXTBOOKS ON SIGNIFICANCE TESTS

Table Y-1 is a survey of four recent introductory statistics books on the tests of significance that they cover. The four books do not all agree, but the combined listing is an indicator of the tests that are considered important. Also in table Y-1 is an entry in column 6 of whether Excel provides direct support for the test or not

Table Y-1: A Set of Significance Tests for Testing Hypotheses

Description of Test	1.	2.	3.	4	5	6
Test for sample mean vs population mean, sigma known	Z	yes	yes		yes	Func
Test for sample mean vs population mean, sigma unknown, large sample	Z	yes		yes	yes	Func
Test for sample mean vs population mean, sigma unknown, small sample	T	yes	yes	yes	yes	Func
Test for sample proportion, population proportion known, large sample, $np > 5$, $nq > 5$	Z	yes	yes	yes	yes	U
Test for sample variance vs population variance, all sizes	Chi	yes		yes		U
Test for sample median vs population median known	Non-param	yes	yes			
Test for means, difference in dependent matched pairs, small samples	T	yes	yes	yes	yes	DA
Test for two samples coming from the same population	Non-param	yes				
Test for difference between means, 2 large independent samples	Z	yes	yes	yes	yes	U
Test for difference between means, 2 small independent samples, equal variances	T	yes	yes	yes	yes	Func & DA
Test for difference between means, 2 small independent samples, unequal variances	T	yes		yes		Func & DA
Test for difference between two proportions, large samples	Z	yes	yes	yes	yes	U

Description of Test	1.	2.	3.	4	5	6
Test for the difference in two sample variances	F	yes	yes	yes		Func & DA
Chi-square Goodness-of-fit test, one column list		yes		yes		U
Chi-square Goodness-of-fit test for independence of variables, contingency table		yes	yes	yes	yes	Func
Test for a correlation coefficient not being equal to zero	Non-param	yes				

Columns 1 through 6 refer to:

1. The type of test or the statistical distribution associated with the test as the characteristic symbol.
2. The test is presented in Larson 2003. The specific Excel instructions are in Dretzke 2003.
2. The test is presented in Levine 1999.
3. The test is presented in Pelosi 2000
4. The test is presented in Moore 2003. Moore goes on to describe more complicated hypothesis tests (Multiple Comparisons, p 771). These can be done in Excel by user constructed cell formulas. However since Excel does not have the non-central F distribution, a value for power cannot be calculated (unless the user writes it as a VBA function).
5. Support given the test in Excel:
 - Func- By an Excel supplied function
 - DA- A routine under Tools – Data Analysis
 - U- By user constructed cell equations.

SUPPORT FOR SIGNIFICANCE TESTS IN EXCEL

Excel only provides support for normal distributions. Excel does not support proportions directly, some of the common non-parametric tests, sample variance or goodness-of-fit tests (one way and fits of data to a discrete distribution). Any capability would have to come from user-generated functions.

The table shows that there is some support in Excel for normal tests. Levine 1999 and Dretzke 2003 extensively use the Prentice-Hall PHStat add-in routines. Pelosi 2000 primarily uses Excel functions and Data Analysis routines. For those not covered by Excel, Pelosi 2000 provides macros to do the test on a CD. MacDoIt.xls is the referenced file. Moore 2003 does not mention Excel here for use on tests of significance.

In every one of these four texts, hand calculators are primarily used during the teaching and problem solving phases. The TI-83 calculator is the one of choice with extensive instructions in the textbooks on how to use it to get answers to problems. The use of Excel to solve problems is introduced at the end of the section/chapter or as outside lab projects