



Tutorials and worked examples for simulation,
 curve fitting, statistical analysis, and plotting.
<https://simfit.org.uk>
<https://simfit.silverfrost.com>

Sometimes data are stored in a matrix such that each row contains values observed within groups that are defined by columns, and where it is wished to test for equality of group means. If normality and identical variance cannot be assumed then systematic nonparametric tests can be performed as long as membership of groups is easy to define and change interactively.

To clarify the situation choose [Statistics] from the main SIMFIT menu followed by [Data exploration] and then [Nonparametric tests across rows of a matrix], and browse the default test file `ttest.tf6` which has the following data.

8.8	8.4	7.9	8.7	9.1	9.6	9.9	9.0	11.1	9.6	8.7	10.4	9.5
8.0	7.4	6.9	8.2	9.7	9.1	9.9	7.0	11.1	8.6	9.7	8.4	9.1
20.2	16.8	15.4	17.1	18.1	20.0	7.7	8.9	9.7	9.1	10.6	10.2	10.1
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
7.7	8.9	10.2	8.5	9.1	8.6	18.9	19.2	15.1	19.5	18.9	19.9	19.4
begin{indicators}												
1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1
end{indicators}												

Note that, after the data, the group membership is defined by the sectioning commands

```
begin{indicators} ... end{indicators}
```

with a 1 if a column belongs to group X , a -1 if the column belongs to group Y and a 0 if a column is not to be used. So in this data set the first 6 columns belong to group X while the next 7 columns belong to group Y and there are no suppressed columns.

Choosing to perform both the Mann-Whitney U and Kolmogorov-Smirnov D two sample tests leads to the following results.

Mann-Whitney U and Kolmogorov-Smirnov D tests

Variables: NX = 6, NY = 7					
MW U	MW Z	MW 2-tail p	KS D	KS Z	KS 2-tail p
7.00000	-1.93389	0.981352	0.54762	0.30467	0.146853
11.0000	-1.36089	0.927739	0.52381	0.29142	0.277389
42.0000	2.92857	0.000583	1.00000	0.55635	0.000000
-1.00000	-1.00000	-1.000000	-1.00000	-1.00000	-1.000000
0.00000	-2.93260	1.000000	1.00000	0.55635	0.000000

The type of test (i.e. lower, upper, or 2-tail) and partitioning of columns into groups can be done interactively, but the Bonferroni or similar correction must be used if, as here, both tests are done. Note the setting of values to -1 with singular data as emphasized in red for row 4.