



Notes and Comments On CAND(E)COMP

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CANDCOMP (CANonical DeCOMPosition) – provides internal analysis of:

- ***a 3- to 7-way data matrix of (dis) similarity matrices,***
- ***by a weighted scalar products model***
- ***using a linear transformation of the data.***

1. CANDECOMP is a Bell Laboratories Program implementing Carroll and Chang's (1970) Canonical Decomposition of N-way Tables, including INDIFF ("Indscal" 3-way, 2-mode analysis) and full CANDECOMP (N-way, N-mode). It is programmed for up to 7-way analysis. (The program is usually referred to as CANDECOMP, but the program call is CANDCOMP).

There are now a wide range of parallel models: PARAFAC2 is now taken as the same basic model, and it has been generalised in a number of ways: to estimating Latent Class Analysis, to Multiple Correspondence Analysis, and constrained CANDECOMP (see refs)

2. MDSX DOCUMENTATION:

MDS(X) Users Manual, Edinburgh 1981, ch 1 (CANDECOMP_TUM.pdf)

The User's Guide to MDS, Heinemann 1982, (7.1.1; 7.2.2)

(CANDECOMP_TUG.pdf)

Key Texts in MDS, Heinemann 1982 (13 = Carroll and Chang 1970).

3. MDSX DATA:

TESTINPUT: (Three data sets; Way-size) (TESTCANDCOMP_INP.txt)

(Unknown) 5,10,10

Three faces of Eve 6,10,15

Steve Tagg's Grid Data 10,6,15

TESTOUTPUT: (TESTCANDCOMP_OUT.txt)

4. **COMMENTS:**

CANDECOMP was the first program in MDS(X) to be tested for use under Windows (NT) at Edinburgh University, with considerable success, but no follow-through.

5. HINTS:

One of the least-used programs in the series, mostly because users conform their needs to the basic INDSCAL model. However, 3-way, 3-mode analysis (especially for Repertory Grids (see test data) and over-time data are much under-used.

6. **REFERENCES**

BASIC REFERENCE:

Carroll, J.D. & Chang, J.-J. (1970): "Analysis of Individual Differences in Multidimensional scaling via an N-way generalization of "Eckart-Young" Decomposition", *Psychometrika* **35**, 283-319.

Further References:

An extensive Three-Mode Bibliography will be found at:
<http://www.fsw.leidenuniv.nl/~kroonenb/>

7. STATUS

The algorithm appears to be stable and reliable; it has been tested only up to 5-way analysis.
Usage: Low