

STRAN – STRucture ANalysis file formats

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STRAN – STRucture ANalysis is a package of DOS programs for network analysis. It is freely available for noncommercial use at

`http:\\vlado.fmf.uni-lj.si\pub\networks\`

The maximum size of a network is 100 units.

Most of the STRAN's programs expect network input data on the NET file and produce their results on the LST (listing) and ANA (further analyses) files. To run STRAN, you need to have only the NET file – all other files are selected/generated during programs execution.

The file extensions are 'free'; but we recommend the use of default extensions (NET, LST, ENV, ANA) or some other system.

1 NET files

NET files contain a description of a network. Their structure can be deduced from the example in Table 1.

- The first line contains:
 - the keyword *NETS,
 - the name of a network (in this case, LJSTUGOV),
 - its size (number of units – in this case, 11), and
 - number of relations in the network (in this case, 6).
- The second line contains a header/label line – a short descriptive title of the network.
- The following lines contain the labels of the units in 7A10 format – each unit name 10 characters, 7 names per line. Use as many lines as you need.
- Sequence of descriptions of relations. Each description starts with:
 - the keyword *NET, followed by
 - a name of the relation,
 - input data format indicator:
 - 0 – binary matrix, 1 – integer matrix, 2 – real matrix, 3 – graph, and
 - symmetry indicator: 0 – general relation, 1 – symmetric relation.

Table 1: Initial part of the NET file Tina.NET

```

*NETS LJSTUGOV 11 6
STUDENT GOVERNMENT OF UNIVERSITY OF LJUBLJANA (Hlebec 1992)
minister 1p.ministerminister 2minister 3minister 4minister 5minister 6
minister 7adviser 1adviser 2adviser 3
*NET DISCAL 0 0
discussion, recall
0 1 1 0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 1 0 0 0
1 1 0 1 0 1 1 1 0 0 0
0 0 0 0 0 0 1 1 0 0 0
0 1 0 1 0 1 1 1 0 0 0
0 1 0 1 1 0 1 1 0 0 0
0 0 0 1 0 0 0 1 1 0 1
0 1 0 1 0 0 1 0 0 0 1
0 0 0 1 0 0 1 1 0 0 1
1 0 1 1 1 0 0 0 0 0 0
0 0 0 0 0 1 0 1 1 0 0
*NET DISCOG 0 0
discussion, recognition
0 1 1 0 0 1 0 0 0 1 0
0 0 0 1 0 1 0 1 0 0 0
1 1 0 1 1 1 1 1 0 1 0
0 0 0 0 0 0 1 1 0 0 0
0 1 0 1 0 1 1 1 0 1 0
0 1 0 1 1 0 1 1 0 0 0
0 0 0 1 0 0 0 1 1 0 1
0 1 0 1 0 0 1 0 0 0 1
0 1 1 0 0 0 1 1 0 0 1
1 1 1 0 1 0 0 0 0 0 0
0 0 0 1 0 1 0 1 0 0 0
*NET ASKCAL 0 0
asking for an opinion, recall
0 1 0 0 0 1 0 0 0 0 0
0 0 0 1 0 0 0 1 0 0 0
1 1 0 1 0 1 0 1 0 0 0
0 1 0 0 0 0 0 0 0 0 0
0 1 0 0 0 1 0 0 0 0 0
0 1 0 0 0 0 0 0 0 0 0
0 0 0 1 0 0 0 1 1 0 0
0 1 0 1 0 0 0 0 0 0 1
0 0 0 0 0 0 1 1 0 0 1
1 1 1 0 1 0 0 0 0 0 0
0 0 1 0 0 1 0 1 0 0 0
*NET ASKCOG 0 0
asking for an opinion, recognition
0 1 1 0 0 0 0 0 0 0 0
0 0 0 1 0 0 0 1 0 0 0
1 1 0 0 .....
.....

```

Table 2: Sharpstone Little League team – SHARP .NET file in graph format

```
*NETS SHARP 13 1
Sharpstone Little League team
justin harry whit brian paul ian mike
jim dan ray cliff mason roy
*NET SHARP 3 0
Sharpstone
-1 2 3 7
-2 1 3 7
-3 1 2 4
-4 1 2 5
-5 1 3 6
-6 1 2 3
-7 1 2 6
-8 1 3 4
-9 1 2 3
-10 1 2 3
-11 1 2 3
-12 1 2 4
-13 3 5 8
0
```

Next line contains a heading describing the relational content of the ties.

Following are the relation data in the selected format (adjacency matrix or lists of neighbors (only in MODEL 2, see Table 2)). Each list of neighbors starts with a negative number $-u$ indicating that u is the current initial vertex. The following positive numbers are the corresponding terminal vertices. For example, the list $-5 1 3 6$ determines the arcs $(5, 1)$, $(5, 3)$ and $(5, 6)$.

The lists are terminated by number 0.

It is possible to analyze multiple matrices/relations, but only with programs ALLREQ, STRUCA and REGULA. Program MODEL analyzes only the first network in a NET file.

2 CLUSE . INF file and ENV files

The names of files used in the last run on the selected network are stored in an environment file with the extension ENV (e.g. SHARP . ENV).

The CLUSE . INF file 'remembers' the name of the last used environment file (which can be overruled). However, during some failing analysis this file can be changed in a way which screws up (to use a technical term) subsequent runs. In case of problems, delete CLUSE . INF and ENV files, and retry.

3 LST files

An output file that can be specified during a run. The recommended extension is LST or OUT.

4 ANA files

A file with an ANA extension is used as a file receiving partition information (for an analysis) or as an input file for giving specific partitions. The value of the criterion function can be computed for the partition, and this partition can be the start point for invoking an optimizing program.

The clustering on ANA file has the following form

```
*CLUSTERING          Oct-10-1993
Sharpstone
MODEL      RANDOM          13    3    0    0          2.0000000
  1    1    2    1    2    2    1    3    3    3    3    3    3
```

The third number in the third line is the number of units, followed by the number of clusters. The last number in this line is the value of criterion function (clustering error). You can edit clusterings on ANA file to test clusterings obtained from other sources/programs. For example

```
*CLUSTERING Sep-14-1992
Sharpstone - alternating clustering
MODEL MANUAL 13 4 0 0 0
1 2 3 4 1 2 3 4 1 2 3 4 1
```