



Simple Network Analysis with UCINET

Mo-Han Hsieh ESD.342 Feb. 28, 2006

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Agenda

- UCINET Basics
- The UCINET Environment
- A Quick Demo
- Import Data
- Export Data
- Data Processing
- Tips of Using UCINET





UCINET Basics

- Official User's Guide of UCINET
 - <u>http://www.analytictech.com/Ucinet_Guide.doc</u>
- Official UCINET Tutorial
 - http://faculty.ucr.edu/~hanneman/nettext/
- Help in UCINET
 - Help > Help Topics
 - <u>Contents</u>: Introduction Section, DL, and Standard Datasets.
 - Index: search by keywords.





The UCINET Environment (I)

- Main window
 - File, Data, Transform, Tools, Network, Options, and Help.



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The UCINET Environment (II)

- The UCINET dataset
 - One dataset consists of Two files.
 - File with extension ##D: actual data.
 - File with ext. ##H: information about the data.
 - In referring to a dataset, refer to the .##H file.



A typical UCINET procedure



Output text in Log Files
 – File>View Previous Output...

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A Quick Demo

- Dataset: KNOKBUR (.##H & .##D)
- 10 organizations and two relationships.
 - Directed graph.
 - Money exchange in one matrix, and information exchange in the other.
 - See Knoke & Kuklinski (1982) for details.



Main window: Data>Display...

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	Spreadsheets	•		
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	Permute Sort Transpose Partitions to Sets Create Node Sets Reshape	Ctrl+T		
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Data Set Filename: KNOKBUR.##H



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ICINET tutorial by Rob Happeman is available at http://facultu.u	naows, Solware for Social Rework Analysis, Hawala, MA, Analysie f	r cennologies.	
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Output log #1

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Matrix #2: KNOKM		
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Main window: Draw File>Open>Ucinet dataset>Network

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Name of file to open: KNOKBUR.##H

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Main window: Network>Centrality>Degree...

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A UCINET tutorial by Bob Hanner	Centrality 🕨	Degree	
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Input dataset: KNOKBUR.##H

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How to cite UCINET:

Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.

A UCINET tutorial by Bob Hanneman is available at http://faculty.ucr.edu/~hanneman/nettext/

)egree		×
Input dataset:	Ucinet 6\DataFiles\KNOKBUR	 🖌 ОК
Treat data as symmetric:	Yes	X Cancel
Include diagonal values?	No	
Output dataset:	FreemanDegree	 : Helb

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Output log #2

🖬 Output Log #1	Ξ×
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E R R R C I Log File Number 1	
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Diagonal valid? NO Model: ASYMMETRIC Input dataset: C:\Program Files\Ucinet 6\DataFiles\KNOKBUR	
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Network Centralization (Outdegree) = 38.272% Network Centralization (Indegree) = 50.617%	
Relation 2: KNOKM	
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Main window: File>View Previous Output...

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Main window: Data>Spreadsheets>Matrix

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UCINET Spreadsheet: File>Open>FreemanDegree.##h

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How to cite UCINET:					
Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for V	/indows: Software for Social Ne	twork Analysis. Harvard, MA:	Analytic Technologies.		
A UCINET tutorial by Bob Hanneman is available at http://faculty	ucr.edu/~hanneman/nettext/				
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Import Data

- UCINET spreadsheet
 - Adjacency matrix
 - Manually input data or cut and paste from elsewhere
- From Excel file
- DL format
 - Full matrix & rectangular matrix
 - Multiple matrices
 - nodelist1 & nodelist2
 - ranklist1
 - edgelist1 & edgelist2
- More information about DL language
 - Main window: Help>Help Topics>Contents>DL





UCINET spreadsheet Data>Spreadsheets>Matrix

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How to cite UCINET:

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Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.

A UCINET tutorial by Bob Hanneman is available at http://faculty.ucr.edu/~hanneman/nettext/

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Import Adjacency Matrix from an Excel File

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8	7	0	1	0	0	0	0	0	1	0	0					
9	8	0	0	0	0	0	0	0	0	1	1					
10	9	0	0	1	0	0	0	0	1	0	0					
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Data>Import>Excel matrix

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	Permute Sort Transpose Partitions to Sets Create Node Sets Reshape	Ctrl+T		
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File Data Transform Tools Network Draw Options Help	
How to cite UCINET:	
Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.	
A UCINET tutorial by Bob Hanneman is available at http://faculty.ucr.edu/~hanneman/nettext/	
Import Adjacency Matrix from Excel	
File names:	
Excel file to import: Program Files\Ucinet 6\DataFiles\KNOKBUR_Example.xls	
Output dataset: C:\Program Files\Ucinet 6\DataFiles\KNOKBUR_Example X Lancel	
Pinensions and Labels	
Format of data in Excel file: Row labels present C Node attribute matrix	
✓ Column labels present ✓ Network adjacency matrix	
Relation labels present	
c:\Program Files\Ucinet 6\datafiles	- 🗟





DL Format: Full Matrix

Full Matrix Format

```
dl n=4 format=fullmatrix
data:
0 1 1 0
1 0 1 1
1 1 0 0
0 1 0 0
```

• Save it as a text file (e.g. TEST.txt).





Data>Import>DL...

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C:\F	Program Files\Ucinet 6\	DataFiles	3	



dl nr = 6, nc = 4data: 0110 1011 1100 0100 1011 1100

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DL Format: Labels

• DL file may contain labels of the nodes





DL Format: Multiple Matrices

dl n = 4, nm = 2labels: GroupA,GroupB,GroupC,GroupD matrix labels: Marriage, Business data: 0101 10000010 1001 0111 10001001

1010





DL Format: External Data

• Data file can be read from other sources

```
dl n = 8
labels:
a1,a2,a3,a4,a5,a6,a7,a8
datafile C:\DATA\External_Data.DAT
```





DL Format: nodelist1 (I)

dl n = 4, format = nodelist1							
labels:							
A,B,C,D							
data:							
1 2 3 Resulting	Resulting Matrix =>						
2 1 3 4		A	В	С	D		
3 1 2	А	0	1	1	0		
4 2	В	1	0	1	1		
	С	1	1	0	0		

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DL Format: nodelist1 (II)

dl n = 4, format = nodelis	t1							
labels:								
A,B,C,D								
data:	Resulting	Mat	rix	=>				
1 2 3			A	В	С	D		
2 1 3		А	0	1	1	0		
2 4		В	1	0	1	1		
3 1 2		С	1	1	0	0		
4 2		D	0	1	0	0		





DL Format: nodelist1 (III)







DL Format: nodelist2

dl nr=3, nc=4 format = nodelist2 row labels embedded column labels embedded data: GP1 A B GP2 C D GP3 A D

Resulting Matrix =>

	A	В	С	D
GP1	1	1	0	0
GP2	0	0	1	1
GP3	1	0	0	1





DL Format: ranklist1

dl n=4 format = ranklist1										
labels embedded										
data:										
ABC										
BCDA	Resulting Matrix =>		A	В	С	D				
CABD		Α	0	1	2	0				
DAC		В	3	0	1	2				
		С	1	2	0	3				
		D	1	0	2	0				





DL Format: edgelist1

dl n=4 format = labels: A,B,C,D data: 1 2 1	edgelist1					
2 1 1	Resulting Matrix =>		A	В	С	D
2 3 1		Α	0	1	2	0
2 4		В	1	0	1	1
3 1 1		С	1		0	0
3 2 na 4 2 5.2		D	0	5.2	0	0





DL Format: edgelist2

```
dl nr=3 nc=5, format = edgelist2
labels embedded:
```

data:

- A1 B1 1
- A1 B2 1.5
- A1 B3 2
- A2 B1 1
- A3 B2 3
- A3 B4 2

A3 B5 1

Resulting Matrix =>

	B1	B2	B3	B4	B5
A1	1	1.5	2	0	0
A2	1	0	0	0	0
A3	0	3	0	2	1





Export Data

- Export UCINET dataset to
 - Excel file
 - Number of columns < 257
 - DL format
 - Easy to do cut and paste
 - Example: Cut and paste as a Matlab data file.
 - Other format





Export Dataset Data>Export>DL...

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c:\Program Files\Ucinet 6\datafiles										





Data Processing

- Most of the data processing functions are in *Data* and *Transform* submenus.
- Some useful functions
 - Data>Affiliations...
 - Data>Extract...
 - Data>Remove isolates
 - Data>Join...
 - Data>Permute...
 - Data>Transpose...





Data Processing Data>Affiliations...

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Convert 2-mode data to 1-mode

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How to cite UCINET:								
Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.								
A UCINET tutorial by Bob Hanneman is available at http://faculty.ucr.edu/~hanneman/nettext/ Successfully opened input file. Read eader information. Read data. Did clean-up. Wrote data to disk. Read data. Did clean-up. Wrote data to disk.								
Affiliations (convert 2-mode data to 1-mode)								
Input dataset:								
Which mode: Bow								
Method: Cross Broducts (co. scourrence)								
None								
Uutput dataset: Affiliations								
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Data Processing Data>Remove isolates

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A UCINET tutorial by Bob Hanneman is available at http://faculty.ucr.edu/~hanneman/nettext/ Successfully opened input file. Read header information. Read data. Did clean-up. Wrote data to disk. Read data. Did clean-up. Wrote data to disk.										
Remove Isolates										
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Data Processing Data>Join...



















Main window: Transform





Tips of Using UCINET

- Before using an UCINET function
 - Check it out in Help>Help Topics>Index
 - Purpose, Description, Parameters, Log File, Timing, Comments, and References.
 - Timing is sometimes important
 - Function with O(N^3) can be a problem for networks with more than 1,000 nodes.
- Setup the following two directories before start working with the UCINET
 - File>Change Default Folder...
 - Options>Output folder





References

- Borgatti, Everett and Freeman, UCINET 6 for Windows: User's Guide. Harvard: Analytic Technologies.
- Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet 6 for Windows. Harvard: Analytic Technologies.