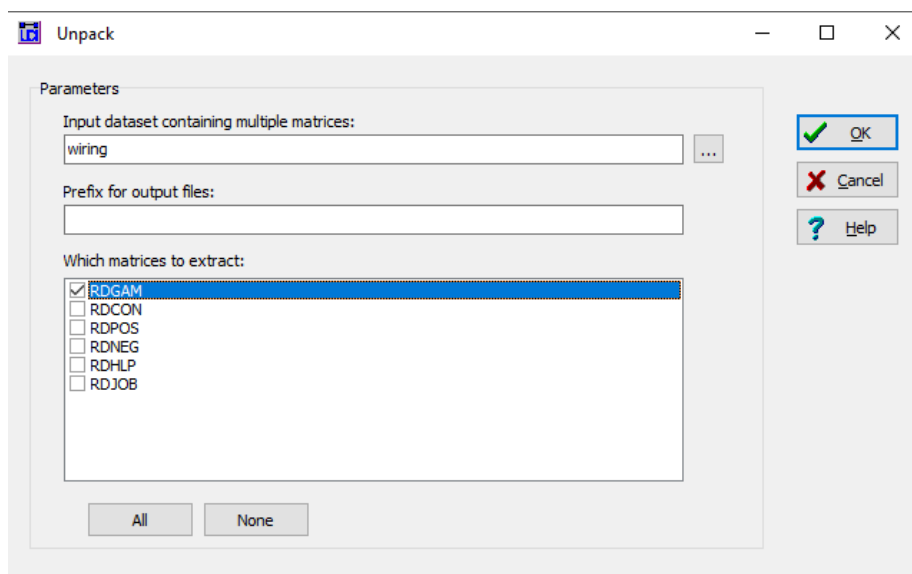


## Practice 11.1

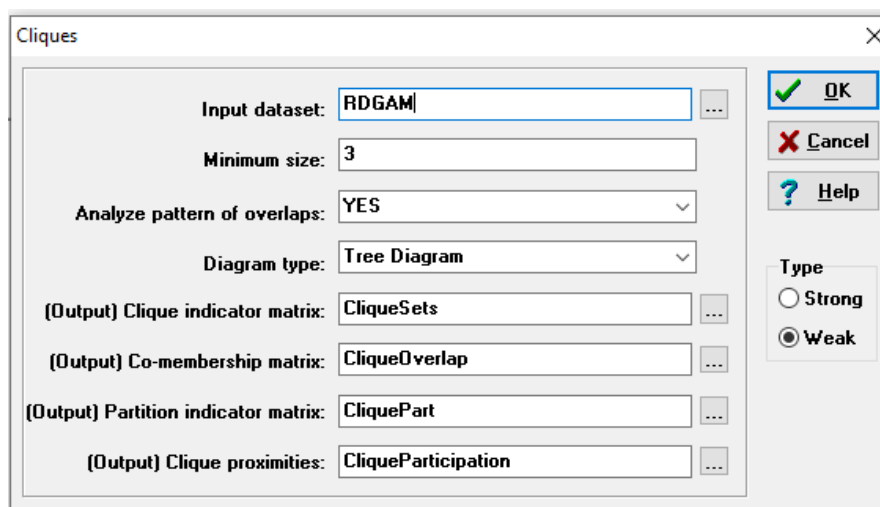
How to find all the cliques and perform a secondary analysis on the games data for the Hawthorne bank wiring room using the UCINET routine

Network|Communities/Subgroups|Cliques

First unpack the Games data from the dataset wiring (Alias name) using data unpack and just select the dataset RDGAM as shown.



Next run Network|Communities/Subgroups|Cliques on RDGAM leaving all other entries on their defaults



Running the routine produces the following giving the 5 cliques as listed together with Figure 11.2. An additional tree diagram and other output are also produced.

```

5 cliques found.

1:  I1 W1 W2 W3 W4
2:  W1 W2 W3 W4 S1
3:  W1 W3 W4 W5 S1
4:  W6 W7 W8 W9
5:  W7 W8 W9 S4

Clique Participation Scores: Prop. of clique members that each node is
adjacent to

      1      2      3      4      5
-----
I1  1.000  0.800  0.600  0.000  0.000
I3  0.000  0.000  0.000  0.000  0.000
W1  1.000  1.000  1.000  0.000  0.000
W2  1.000  1.000  0.800  0.000  0.000
W3  1.000  1.000  1.000  0.000  0.000
W4  1.000  1.000  1.000  0.000  0.000
W5  0.600  0.800  1.000  0.250  0.250
W6  0.000  0.000  0.000  1.000  0.750
W7  0.000  0.000  0.200  1.000  1.000
W8  0.000  0.000  0.000  1.000  1.000
W9  0.000  0.000  0.000  1.000  1.000
S1  0.800  1.000  1.000  0.000  0.000
S2  0.000  0.000  0.000  0.000  0.000
S4  0.000  0.000  0.000  0.750  1.000

HIERARCHICAL CLUSTERING OF OVERLAP MATRIX

      I I W W W W S S W W W W S
      3 1 5 2 1 3 4 1 2 6 7 8 9 4

Level  2 1 7 4 3 5 6 2 3 8 9 0 1 4
-----
3.000  . . . . XXXXX . . . . .
2.000  . . . XXXXXXX . . . . .
1.800  . . . XXXXXXXXXXX . . XXXXX .
1.000  . . . XXXXXXXXXXX . XXXXXXX .
0.911  . . XXXXXXXXXXXXX . XXXXXXX .
0.800  . . XXXXXXXXXXXXX . XXXXXXXXXXX
0.381  . XXXXXXXXXXXXXXX . XXXXXXXXXXX
0.000  XXXXXXXXXXXXXXXXXXXXXXXXXXXX

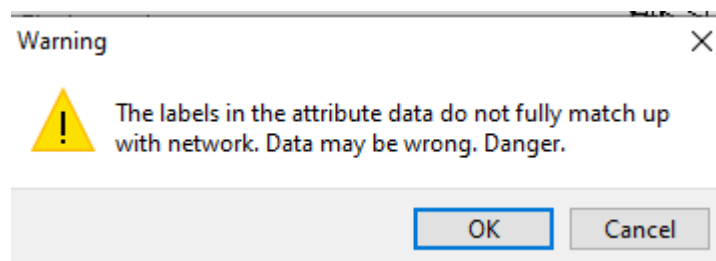
```

Note Figure 11.4 is not a bimodal but is just the standard clustering produced using the cliques routine as above.

As in the previous example unpack Friends from KarateNet and run Cliques. In the output will be Figure 11.4 after the clique participation matrix has been shown.

| HIERARCHICAL CLUSTERING OF OVERLAP MATRIX |   |   |     |       |     |   |   |   |                |   |   |   |   |   |   |   |   |   |            |                                      |   |   |   |   |   |   |   |   |                    |          |   |   |   |                    |
|-------------------------------------------|---|---|-----|-------|-----|---|---|---|----------------|---|---|---|---|---|---|---|---|---|------------|--------------------------------------|---|---|---|---|---|---|---|---|--------------------|----------|---|---|---|--------------------|
|                                           | A | A | A   | A     | A   | A | A | A | A              | A | A | A | A | A | A | A | A | A | A          | A                                    | A | A | A | A | A | A | A | A | A                  | A        | A | A | A | A                  |
|                                           | 1 | 1 | 0   | 1     | 0   | 0 | 1 | 1 | 0              | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2          | 2                                    | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0                  | 3        | 3 | 2 | 3 | 3                  |
|                                           | 0 | 2 | 5   | 1     | 6   | 7 | 7 | 3 | 1              | 2 | 3 | 4 | 8 | 4 | 8 | 0 | 2 | 9 | 5          | 6                                    | 2 | 8 | 7 | 3 | 1 | 9 | 6 | 5 | 9                  | 1        | 0 | 4 | 3 | 4                  |
|                                           | 1 | 1 |     | 1     |     |   | 1 | 1 |                |   |   |   |   | 1 | 1 | 2 | 2 | 2 | 2          | 2                                    | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |                    | 3        | 3 | 2 | 3 | 3                  |
| Level                                     | 0 | 2 | 5   | 1     | 6   | 7 | 7 | 3 | 1              | 2 | 3 | 4 | 8 | 4 | 8 | 0 | 2 | 9 | 5          | 6                                    | 2 | 8 | 7 | 3 | 1 | 9 | 6 | 5 | 9                  | 1        | 0 | 4 | 3 | 4                  |
| -----                                     | - | - | -   | -     | -   | - | - | - | -              | - | - | - | - | - | - | - | - | - | -          | -                                    | - | - | - | - | - | - | - | - | -                  | -        | - | - | - |                    |
| 8.000                                     | . | . | .   | .     | .   | . | . | . | .              | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXX                |
| 5.000                                     | . | . | .   | .     | .   | . | . | . | XXX            | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXX                |
| 2.333                                     | . | . | .   | .     | .   | . | . | . | XXXXXX         | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXX                |
| 2.133                                     | . | . | .   | .     | .   | . | . | . | XXXXXXXX       | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXX                |
| 2.000                                     | . | . | .   | .     | XXX | . | . | . | XXXXXXXX       | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXX                |
| 1.667                                     | . | . | .   | .     | XXX | . | . | . | XXXXXXXX       | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXXXX              |
| 1.500                                     | . | . | .   | .     | XXX | . | . | . | XXXXXXXX       | . | . | . | . | . | . | . | . | . | .          | .                                    | . | . | . | . | . | . | . | . | .                  | .        | . | . | . | XXXXXXXX           |
| 1.000                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXX   | . | . | . | . | . | . | . | . | . | XXXXXX     | .                                    | . | . | . | . | . | . | . | . | XXX                | XXXXXXXX | . | . | . | XXXXXXXX           |
| 0.667                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXX   | . | . | . | . | . | . | . | . | . | XXXXXX     | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXX   | .        | . | . | . | XXXXXXXXXXXXXXXX   |
| 0.600                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXX   | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.450                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXX   | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.444                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.394                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.350                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.315                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.286                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.263                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | .                                    | . | . | . | . | . | . | . | . | XXXXXXXXXXXXXXXXXX | .        | . | . | . | XXXXXXXXXXXXXXXXXX |
| 0.242                                     | . | . | XXX | XXXXX | .   | . | . | . | XXXXXXXXXXXXXX | . | . | . | . | . | . | . | . | . | XXXXXXXXXX | XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX | . |   |   |   |   |   |   |   |                    |          |   |   |   |                    |

We now use the clique participation matrix to do the bimodal analysis. First open `netdraw` and load `cliqueparticipation` as a 2-mode network. Next load in as an attribute the dataset `Karateattr`. Note this an attribute file corresponding to the one mode dataset `KarateNet` and so does not match up. This produces a warning as follows



However in our case we do not have attributes for the cliques but it will load correctly for the actors. By default the actors are circles and the cliques are squares. Finally turn off the arrows and change the colours so that the cliques are white (the ? attribute) and select two colours for the two club attributes. The book uses grey and black but it would be better to choose other colours to obtain the following.

