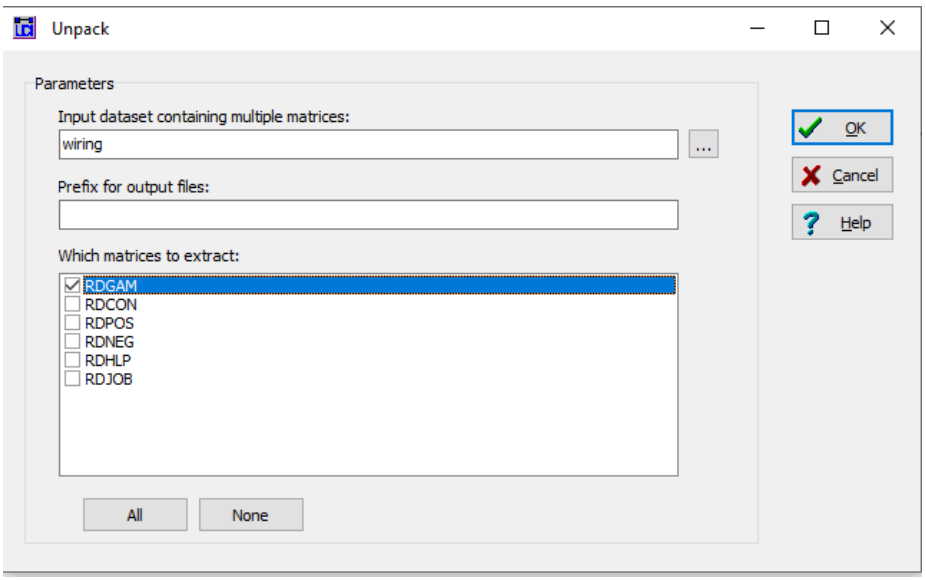
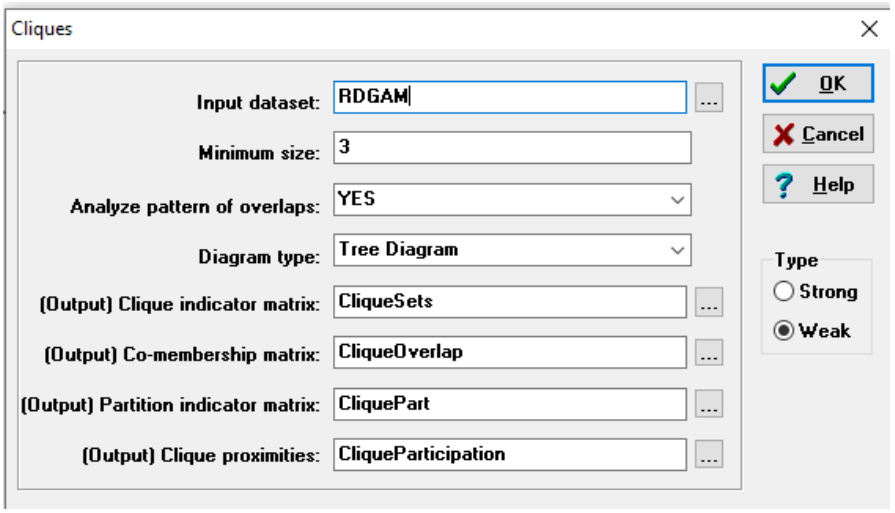
# Practice 11.1

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

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

How to apply the bimodal technique to the karate club data, Figures 11.4 and 11.5 using Network|Communities/Subgroups|Cliques

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.

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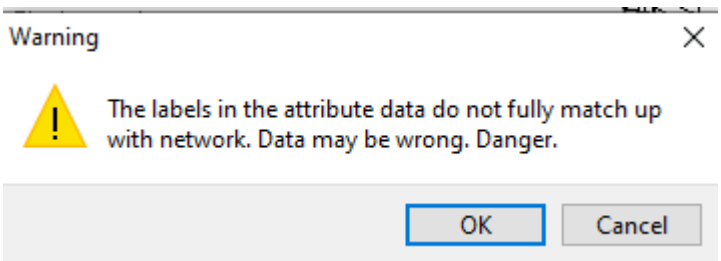
HIERARCHICAL CLUSTERING OF OVERLAP MATRIX

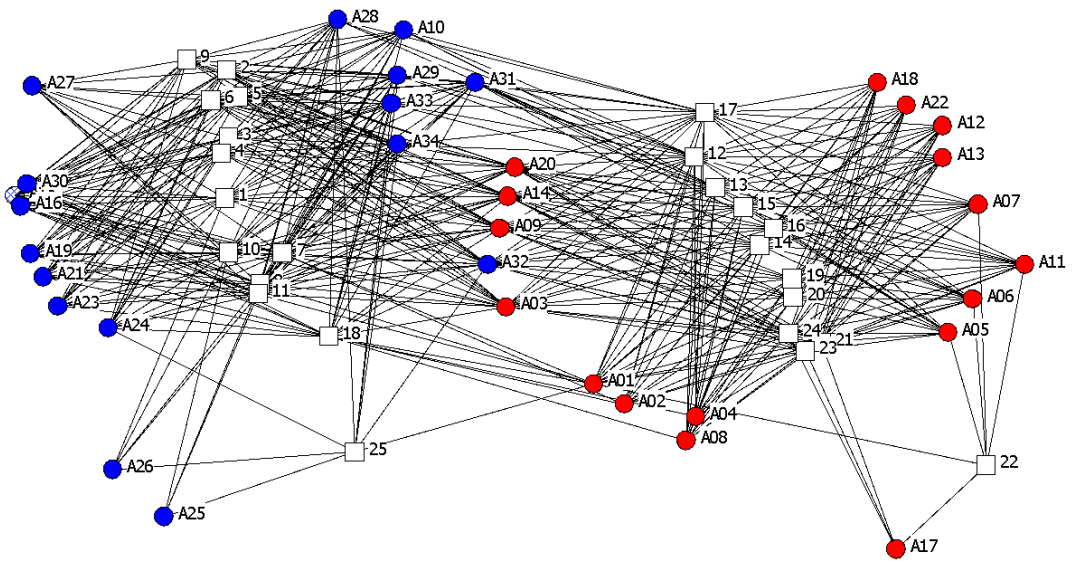
        A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A
        1 1 0 1 0 0 1 1 0 0 0 0 0 1 1 2 2 2 2 2 3 2 2 2 2 1 1 1 0 3 3 2 3 3
        0 2 5 1 6 7 7 3 1 2 3 4 8 4 8 0 2 9 5 6 2 8 7 3 1 9 6 5 9 1 0 4 3 4

        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   . . . . . . . . XXXXX . . . . . . . . . . . . . . . . . . . . XXX
2.133   . . . . . . . . XXXXXXX . . . . . . . . . . . . . . . . . . . XXX
2.000   . . . . XXX . . XXXXXXX . . . . . . . . . . . . . . . . . . . XXX
1.667   . . . . XXX . . XXXXXXX . . . . . . . . . . . . . . . . . XXXXX
1.500   . . . . XXX . . XXXXXXX . . . . . . . . . . . . . . . . XXXXXXX
1.000   . . XXX XXXXX . XXXXXXXXX . . . . . XXXXX . . . . . . . XXX XXXXXXX
0.667   . . XXX XXXXX . XXXXXXXXX . . . . . XXXXX . . . . . . . XXXXXXXXXXX
0.600   . . XXX XXXXX . XXXXXXXXX . . . . XXXXXXX . . . . . . . XXXXXXXXXXX
0.450   . . XXX XXXXX . XXXXXXXXX . . . . XXXXXXX . . . . . . XXXXXXXXXXXXX
0.444   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . . . . . . XXXXXXXXXXXXX
0.394   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . . . . . XXXXXXXXXXXXXXX
0.350   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . . . . XXXXXXXXXXXXXXXXX
0.315   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . . . XXXXXXXXXXXXXXXXXXX
0.286   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . . XXXXXXXXXXXXXXXXXXXXX
0.263   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX . XXXXXXXXXXXXXXXXXXXXXXX
0.242   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX
0.210   . . XXX XXXXX . XXXXXXXXXXX . . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.178   . . XXXXXXXXX . XXXXXXXXXXX . . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.127   . . XXXXXXXXX XXXXXXXXXXXXX . . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.030   . . XXXXXXXXX XXXXXXXXXXXXXXX . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.014   . . XXXXXXXXX XXXXXXXXXXXXXXXXX . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.007   . . XXXXXXXXX XXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.001   . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.000   . . XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.000   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

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 bebetter to choose other colours to obtain the following.


A28
A10
9
2
A27
A29
A31
6
5
A33
17
A18
A22
A12
3
4
A34
12
A13
A20
A30
1
A14
13
15
A07
A16
A09
16
14
A19
10
7
A32
A11
A21
19
20
11
A03
A06
A23
A24
18
24
21
A05
23
A01
A02
A04
A08
25
22
A26
A25
A17