GCN4R_demo

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Import Library, link anaconda to R studio

```r
reticulate::use_condaenv(condaenv = "gcn4r", conda = "/anaconda2/bin/conda")
reticulate:::conda_list(conda = "auto")
```

```
##                        name                                              python
## 1                         3          /Users/joshualevy/.julia/conda/3/bin/python
## 2                 anaconda2                             /anaconda2/bin/python
## 3                       bio                     /anaconda2/envs/bio/bin/python
## 4                     gcn4r                   /anaconda2/envs/gcn4r/bin/python
## 5                  interact                /anaconda2/envs/interact/bin/python
## 6   interaction_transformer /anaconda2/envs/interaction_transformer/bin/python
## 7                   manubot                 /anaconda2/envs/manubot/bin/python
## 8                       mne                     /anaconda2/envs/mne/bin/python
## 9                 mortality               /anaconda2/envs/mortality/bin/python
## 10                 pathflow                /anaconda2/envs/pathflow/bin/python
## 11                     py27                    /anaconda2/envs/py27/bin/python
## 12                     py36                    /anaconda2/envs/py36/bin/python
## 13                     rqda                    /anaconda2/envs/rqda/bin/python
## 14            test_installs           /anaconda2/envs/test_installs/bin/python
```

```r
reticulate:::use_python("/anaconda2/envs/gcn4r/bin/python")
GCN4R<-import_gcn4r()
GCN4R$api
```

```
## Module(gcn4r.api)
```

Load data

fix convergence or load new data

```r
# alternative data
physician.files<-c("../gcn4r/data/A_physician.csv","../gcn4r/data/X_physician.csv")
# load lawyer data
net.list<-generate.net.list("A_lawyer.csv","X_lawyer.csv")
net.list
```

```
## $A
##      X X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X20
## 1    0  1  1  0  1  1  0  0  1  0  0   1   0   0   0   0   1   1   0   1   1   1
```

```
## 2   1   1 1 1 1 1 0 1 1 0 0 1 0 1 0 0 1 1 1 0 1 1 0
## 3   2   0 1 1 1 0 1 0 0 0 0 0 0 0 1 0 0 1 1 1 0 0
## 4   3   1 1 1 1 0 1 0 0 1 0 0 1 1 1 0 1 1 0 1 1 1
## 5   4   1 0 0 0 1 1 0 0 0 0 1 0 0 0 0 0 0 1 0 1 0
## 6   5   0 1 1 1 1 1 0 0 0 0 0 0 0 1 1 1 0 1 1 0 0
## 7   6   0 1 0 0 0 0 1 0 0 1 0 0 0 0 0 1 0 0 0 0 0
## 8   7   1 0 0 0 0 0 0 1 0 0 1 1 1 0 0 0 1 0 0 0 0
## 9   8   0 0 0 1 0 0 0 0 1 0 1 1 0 0 0 1 1 0 1 0 1
## 10  9   0 1 0 0 0 0 1 0 0 1 0 1 0 0 0 1 1 0 0 0 0
## 11 10   1 0 0 0 1 0 0 1 1 0 1 1 1 0 0 0 1 0 0 0 1
## 12 11   0 1 0 1 0 0 0 1 1 1 1 1 1 1 1 1 1 0 1 0 0
## 13 12   0 0 0 1 0 0 0 1 0 0 1 1 1 0 1 1 1 0 1 1 1
## 14 13   0 0 1 1 0 1 0 0 0 0 0 1 0 1 1 1 1 0 0 1 0
## 15 14   0 1 0 0 0 1 0 0 0 0 0 1 1 1 1 1 0 0 1 1 0
## 16 15   1 1 0 1 0 1 1 0 1 1 0 1 1 1 1 1 1 0 1 0 0
## 17 16   1 1 1 1 0 0 0 1 1 1 1 1 1 1 0 1 1 0 1 1 1
## 18 17   0 0 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
## 19 18   1 1 1 1 0 1 0 0 1 0 0 1 1 0 1 1 1 0 1 1 1
## 20 19   1 1 0 1 1 0 0 0 0 0 0 0 1 1 1 0 1 0 1 1 1
## 21 20   1 0 0 1 0 0 0 0 1 0 1 0 1 0 0 0 1 0 1 1 1
## 22 21   1 1 0 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 1 1 0
## 23 22   1 0 1 1 1 0 0 1 0 0 1 0 1 0 0 0 0 1 0 1 0
## 24 23   1 1 0 1 0 1 0 1 0 1 1 1 1 0 0 1 1 0 1 1 1
## 25 24   0 0 1 0 0 0 0 0 1 0 0 1 0 1 0 1 1 0 0 1 0
## 26 25   1 1 0 1 1 1 0 1 1 1 1 1 1 0 1 1 1 0 1 1 1
## 27 26   1 1 0 1 1 1 0 0 1 1 1 0 1 0 1 1 0 0 0 1 1
## 28 27   0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 1 1 1 1 0 0
## 29 28   1 1 0 1 0 0 0 0 1 1 0 1 0 0 1 1 1 0 1 1 0
## 30 29   1 0 1 0 0 1 0 0 0 0 0 0 0 1 0 0 1 0 1 1 0
## 31 30   0 0 0 1 1 1 0 0 0 0 0 0 1 0 1 0 0 1 0 1 1
## 32 31   0 0 0 0 1 1 0 0 0 0 0 1 0 1 1 1 0 1 1 0 0
## 33 32   0 0 0 0 1 0 1 0 0 0 0 0 1 0 0 0 0 1 0 0 1
## 34 33   0 1 0 0 0 0 1 0 0 1 0 1 1 1 1 1 1 0 1 0 0
## 35 34   0 0 0 1 1 1 1 0 0 0 0 1 0 1 1 0 0 1 1 1 0
## 36 35   1 0 0 0 0 0 0 1 0 0 0 0 1 0 1 0 0 0 0 0 0
## 37 36   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 0 0
## 38 37   0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 0 0 0 0 0
## 39 38   1 0 0 0 1 0 0 0 0 0 1 0 1 0 0 0 1 0 0 0 0
## 40 39   0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 0 1 0 0 1 1
## 41 40   1 0 0 1 0 0 0 1 0 0 1 0 1 0 0 0 0 0 0 0 1
## 42 41   0 1 0 1 0 0 0 0 1 0 0 1 1 1 0 1 1 0 1 1 0
## 43 42   1 1 0 0 0 0 0 1 0 0 1 0 1 0 0 0 0 0 1 1 1
## 44 43   0 1 0 0 0 0 0 0 0 1 0 0 0 0 1 1 1 0 0 0 0
## 45 44   0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 1 1 0 1 0 0
## 46 45   0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 1 1 0 1 0 0
## 47 46   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
## 48 47   0 1 0 0 0 0 0 0 1 1 0 1 1 1 0 1 1 0 0 0 0
## 49 48   0 0 0 0 0 0 0 1 0 0 1 0 1 0 0 0 0 0 0 0 1
## 50 49   0 0 0 0 1 1 0 0 0 0 0 1 0 1 0 1 0 1 0 0 0
## 51 50   0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0
## 52 51   0 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 1
## 53 52   0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 1 0 0 1 0 0
## 54 53   1 0 0 0 1 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0
## 55 54   0 0 0 0 0 0 0 0 0 1 0 0 1 0 0 1 0 0 0 1 1
```

```
## 56 55 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 1 1
## 57 56 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1
## 58 57 0 0 0 0 1 1 1 0 0 0 0 0 1 0 0 0 0 1 0 0 0
## 59 58 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
## 60 59 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 1 1 0 1 0 0
## 61 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## 62 61 0 0 0 0 0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 0 0
## 63 62 0 0 0 0 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0
## 64 63 0 1 0 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0
## 65 64 0 0 0 1 0 1 0 1 0 0 1 0 1 0 0 0 0 0 0 0 0
## 66 65 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 1
## 67 66 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
## 68 67 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1
## 69 68 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## 70 69 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1
## 71 70 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
```

	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39
## 1	1	1	1	0	1	1	0	1	1	0	0	0	0	0	1	0	0	1	0
## 2	1	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0
## 3	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
## 4	1	1	1	0	1	1	1	1	0	1	0	0	0	1	0	0	0	0	0
## 5	0	1	0	0	1	1	1	0	0	1	1	1	0	1	0	0	0	1	0
## 6	0	0	1	0	1	1	1	0	1	1	1	0	0	1	0	0	0	0	0
## 7	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0
## 8	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
## 9	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
## 10	0	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0
## 11	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
## 12	0	0	1	1	1	0	1	1	0	0	1	0	1	1	0	0	1	0	0
## 13	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1
## 14	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	0	0	0	0
## 15	1	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	0	0
## 16	1	0	1	1	1	1	1	1	0	0	1	0	1	0	0	1	1	0	0
## 17	1	0	1	1	1	0	1	1	1	0	0	0	1	0	0	0	0	1	1
## 18	0	1	0	0	0	0	1	0	0	1	1	1	0	1	0	0	0	0	0
## 19	1	0	1	0	1	0	1	1	1	0	1	0	1	1	0	1	0	0	0
## 20	1	1	1	1	1	1	0	1	1	1	0	0	0	1	0	0	0	0	1
## 21	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	1
## 22	1	0	0	0	1	0	1	0	1	1	1	1	1	0	0	0	0	1	0
## 23	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
## 24	0	0	1	0	1	1	1	0	1	1	0	1	0	0	1	0	1	0	1
## 25	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
## 26	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
## 27	0	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	1
## 28	1	0	1	1	1	0	1	1	1	1	1	0	1	1	0	0	0	0	0
## 29	0	0	0	0	1	1	1	1	0	0	0	0	1	0	1	0	0	0	0
## 30	1	0	1	1	1	0	1	0	1	1	1	1	0	1	1	0	0	1	0
## 31	1	0	1	0	1	0	1	0	1	1	1	1	0	1	0	0	0	0	0
## 32	1	0	0	0	1	0	1	0	1	1	1	1	0	1	0	0	0	0	0
## 33	1	1	1	1	1	0	0	0	1	1	1	1	1	1	0	0	1	0	0
## 34	1	0	0	0	1	1	1	1	0	0	0	1	1	0	1	0	0	0	0
## 35	0	0	0	1	1	0	1	0	1	1	1	1	0	1	0	0	1	0	0
## 36	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	1	0	0
## 37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0

```
## 38  0  0  1  0  1  0  0  0  0  0  0  1  0  1  1  0  1  0  1
## 39  1  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  1  1
## 40  0  0  1  0  1  1  0  0  0  0  0  0  0  0  0  0  1  1  1
## 41  1  1  1  0  1  1  0  1  0  1  0  1  0  0  1  0  1  1  1
## 42  0  0  1  0  1  1  1  1  1  0  0  0  1  0  0  1  1  1  1
## 43  0  0  1  0  1  1  0  0  0  0  0  0  0  0  1  0  0  0  1
## 44  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
## 45  0  0  0  1  0  0  1  1  0  0  0  0  1  0  0  0  0  0  0
## 46  0  0  0  0  0  0  1  0  1  1  0  0  1  1  0  0  0  0  0
## 47  1  1  0  0  0  0  0  0  1  0  0  0  0  0  1  1  0  0  0
## 48  0  0  1  0  0  0  0  1  0  0  0  0  1  0  0  0  1  1  0
## 49  1  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1
## 50  0  0  0  1  0  0  1  0  1  1  1  0  0  1  0  1  0  0  0
## 51  1  0  0  0  0  0  0  0  1  1  1  1  0  1  0  0  1  1  1
## 52  0  1  1  0  1  0  0  0  0  1  0  0  0  0  1  0  1  1  1
## 53  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
## 54  1  0  0  0  1  0  0  0  0  0  0  1  0  0  1  0  0  0  1
## 55  1  1  1  0  1  1  0  0  0  1  0  0  0  0  1  0  1  1  1
## 56  1  1  1  0  1  1  0  0  0  0  0  0  1  0  0  0  1  1  1
## 57  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  1
## 58  0  0  0  0  0  0  1  0  1  1  1  1  0  0  0  0  0  0  0
## 59  0  0  0  0  0  0  0  0  1  1  1  1  0  0  0  0  0  0  0
## 60  0  0  0  0  1  0  0  0  0  0  0  0  1  1  0  0  0  0  0
## 61  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
## 62  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  1  0  0  0
## 63  0  0  0  1  0  0  1  0  1  1  1  1  0  1  0  0  0  0  0
## 64  1  0  1  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
## 65  1  0  1  0  1  1  0  0  1  0  0  0  0  0  1  0  1  1  1
## 66  1  1  1  0  1  0  1  0  0  0  0  0  0  0  0  0  0  1  1
## 67  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1  1
## 68  1  0  0  0  1  1  0  0  0  0  0  0  0  0  0  0  0  0  1
## 69  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0
## 70  0  0  0  0  0  0  1  1  0  0  1  0  0  0  0  0  0  0  1
## 71  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  1  1
##     X40 X41 X42 X43 X44 X45 X46 X47 X48 X49 X50 X51 X52 X53 X54 X55 X56 X57 X58
## 1    1   0   1   0   0   0   0   0   0   0   0   0   0   1   0   0   0   0   0
## 2    0   1   1   1   0   0   0   1   0   0   0   0   1   0   0   0   0   0   0
## 3    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
## 4    1   1   0   0   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0
## 5    0   0   0   0   0   0   0   0   0   1   1   0   0   1   0   0   0   1   1
## 6    0   0   0   0   0   0   0   0   0   1   0   0   0   0   0   0   0   1   1
## 7    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   1   0
## 8    1   0   1   0   0   0   0   0   1   0   0   1   0   0   0   0   0   0   0
## 9    0   1   0   0   1   0   0   1   0   0   0   0   0   0   0   0   0   0   0
## 10   0   0   0   1   0   0   0   1   0   0   0   0   1   0   1   0   0   0   0
## 11   1   0   1   0   0   0   0   0   1   0   0   0   0   1   0   1   0   0   0
## 12   0   1   0   0   0   0   0   1   0   1   0   0   0   0   0   0   0   0   0
## 13   1   1   1   0   0   0   0   1   1   0   1   1   0   1   1   1   1   1   0
## 14   0   1   0   0   0   0   0   1   0   1   0   0   0   0   0   0   0   0   0
## 15   0   0   0   1   0   0   1   0   0   0   0   0   0   0   0   0   0   0   0
## 16   0   1   0   1   1   1   0   1   0   1   0   0   1   0   1   0   0   0   0
## 17   0   1   0   1   1   1   0   1   0   0   0   0   0   0   0   0   0   0   0
## 18   0   0   0   0   0   0   0   0   0   1   1   0   0   0   0   0   0   1   1
## 19   0   1   1   0   1   1   0   0   0   0   0   0   1   0   0   0   0   0   0
```

```
## 20  0  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  0  0  0
## 21  1  0  1  0  0  0  0  0  1  0  0  1  0  0  1  1  1  0  0
## 22  1  0  0  0  0  0  1  0  1  0  1  0  0  1  1  1  0  0  0
## 23  1  0  0  0  0  0  1  0  0  0  0  1  0  0  1  1  0  0  0
## 24  1  1  1  0  0  0  0  1  0  0  0  1  1  0  1  1  1  0  0
## 25  0  0  0  0  1  0  0  0  0  1  0  0  0  0  0  0  0  0  0
## 26  1  1  1  0  0  0  0  0  1  0  0  1  0  1  1  1  0  0  0
## 27  1  1  1  0  0  0  0  0  0  0  0  0  0  0  1  1  1  0  0
## 28  0  1  0  0  1  1  0  0  0  1  0  0  0  0  0  0  0  1  0
## 29  1  1  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0  0  0
## 30  0  1  0  0  0  1  1  0  0  1  1  0  0  0  0  0  0  1  1
## 31  1  0  0  0  0  1  0  0  0  1  1  1  0  0  1  0  0  1  1
## 32  0  0  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  1  1
## 33  1  0  0  0  0  0  0  0  0  0  1  0  0  1  0  0  0  1  1
## 34  0  1  0  1  1  1  0  1  0  0  0  0  0  0  0  1  0  0  0
## 35  0  0  0  0  0  1  0  0  0  1  1  0  0  0  0  0  0  0  0
## 36  1  0  1  0  0  0  1  0  0  0  0  1  0  1  1  0  0  0  0
## 37  0  1  0  0  0  0  1  0  0  1  0  0  0  0  0  0  0  0  0
## 38  1  1  0  0  0  0  0  1  0  0  1  1  0  0  1  1  1  0  0
## 39  1  1  0  0  0  0  0  1  0  0  1  1  0  0  1  1  1  0  0
## 40  1  1  1  0  0  0  0  0  1  0  1  1  0  1  1  1  1  0  0
## 41  1  1  1  0  1  0  0  0  1  1  1  1  0  1  1  1  1  0  0
## 42  1  1  0  0  1  0  0  1  0  1  0  1  0  0  0  0  0  0  0
## 43  1  0  1  0  0  0  0  1  0  0  1  0  0  0  1  0  1  0  0
## 44  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
## 45  1  1  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0
## 46  0  0  0  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0
## 47  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0
## 48  0  1  1  0  1  1  0  1  0  0  0  0  0  0  0  0  0  0  0
## 49  1  0  0  0  0  0  0  0  1  0  1  1  0  0  1  0  0  0  0
## 50  1  1  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0  0
## 51  1  0  1  0  0  0  0  0  1  1  1  1  0  1  0  1  1  1  1
## 52  1  1  0  0  0  0  0  0  1  0  1  1  0  1  1  1  1  0  0
## 53  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
## 54  1  0  0  0  0  0  0  0  0  0  1  1  0  1  1  1  0  1  0
## 55  1  0  1  0  0  0  0  0  1  0  0  1  0  1  1  1  1  0  0
## 56  1  0  0  0  0  0  0  0  0  0  1  1  0  1  1  1  1  0  0
## 57  1  0  1  0  0  0  0  0  0  0  1  1  0  0  1  1  1  0  0
## 58  0  0  0  0  0  0  0  0  0  0  1  0  0  1  0  0  0  1  1
## 59  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  1  1
## 60  0  0  0  0  1  1  0  0  0  0  1  0  0  0  0  0  0  0  0
## 61  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
## 62  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  1  1  0  0
## 63  0  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0  0  0  0
## 64  0  0  0  0  0  0  0  1  0  0  0  0  1  0  0  1  0  0  0
## 65  1  0  0  0  0  0  0  0  1  0  0  1  0  1  1  1  1  1  0
## 66  1  0  0  0  0  0  0  0  1  1  0  1  0  1  1  1  1  0  0
## 67  0  0  1  0  0  0  0  0  1  0  0  1  0  1  1  1  1  0  0
## 68  1  0  0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
## 69  0  0  0  0  0  0  0  0  1  0  0  0  0  1  0  0  0  0  0
## 70  0  0  0  0  1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
## 71  0  0  0  0  0  0  0  0  1  0  0  1  0  0  1  1  1  0  0
##     X59 X60 X61 X62 X63 X64 X65 X66 X67 X68 X69 X70
## 1    0   0   0   0   0   0   0   0   0   0   0   0
```

```
## 2    0   0   0   0   1   0   0   0   0   0   0   0
## 3    0   0   0   0   0   0   0   0   0   0   0   0
## 4    0   0   0   0   0   1   0   0   0   0   1   0
## 5    0   0   0   1   0   0   0   0   0   0   0   0
## 6    0   0   0   0   0   1   0   0   0   0   0   0
## 7    0   0   0   0   1   0   0   0   0   0   0   0
## 8    0   0   0   0   0   1   0   0   0   0   0   0
## 9    1   0   0   0   0   0   0   0   0   0   0   0
## 10   1   0   0   0   1   0   0   0   0   0   0   0
## 11   0   0   0   0   0   1   0   0   0   0   0   0
## 12   1   0   1   0   0   0   1   0   0   0   0   0
## 13   0   0   0   0   1   1   1   1   1   0   0   1
## 14   0   0   0   1   0   0   0   0   0   0   0   0
## 15   0   0   1   1   0   0   0   0   0   0   0   0
## 16   1   0   0   0   1   0   0   0   0   0   0   0
## 17   1   0   0   0   0   0   0   0   0   0   0   0
## 18   0   0   0   0   0   0   0   0   0   0   0   0
## 19   1   0   0   0   1   0   0   0   0   0   1   0
## 20   0   0   0   0   0   0   0   0   1   0   0   0
## 21   0   0   0   0   0   0   1   0   1   0   1   0
## 22   0   0   0   0   1   1   1   0   1   0   0   1
## 23   0   0   0   0   0   0   1   0   0   0   0   0
## 24   0   0   0   0   1   1   1   1   0   0   0   0
## 25   0   0   0   1   0   0   0   0   0   0   0   0
## 26   1   0   1   0   0   1   1   0   1   1   0   0
## 27   0   0   0   0   0   1   0   0   1   0   0   0
## 28   0   0   0   1   0   0   1   0   0   0   1   0
## 29   0   0   0   0   0   0   0   0   0   0   1   0
## 30   0   0   0   1   0   1   0   0   0   0   0   0
## 31   0   0   0   1   0   0   0   0   0   0   0   0
## 32   0   0   0   1   0   0   0   0   0   0   1   0
## 33   0   0   0   1   0   0   0   0   0   0   0   0
## 34   1   1   0   0   1   0   0   0   0   0   0   0
## 35   1   0   0   1   0   0   0   0   0   0   0   0
## 36   0   0   0   0   0   1   0   0   0   0   0   0
## 37   0   0   1   0   0   0   0   0   0   0   0   0
## 38   0   0   0   0   0   1   0   1   0   0   0   0
## 39   0   0   0   0   0   1   1   1   0   1   0   1
## 40   0   0   0   0   0   1   1   1   1   0   1   1
## 41   0   0   0   0   0   1   1   0   1   0   0   0
## 42   0   0   0   0   0   0   0   0   0   0   0   0
## 43   0   0   0   0   0   0   0   1   0   0   0   0
## 44   0   0   0   0   0   0   0   0   0   0   0   0
## 45   1   0   1   0   0   0   0   0   0   0   1   0
## 46   1   0   0   1   0   0   0   0   0   0   0   0
## 47   0   0   0   0   0   0   0   0   0   0   0   0
## 48   0   0   0   0   1   0   0   0   0   0   0   0
## 49   0   0   0   0   0   1   1   1   0   1   0   1
## 50   0   0   0   1   0   0   1   0   0   0   0   0
## 51   1   0   0   0   0   0   0   0   0   0   0   0
## 52   0   0   0   0   0   1   1   1   0   0   0   1
## 53   0   0   0   0   1   0   0   0   0   0   0   0
## 54   0   0   0   0   0   1   1   1   1   1   0   0
## 55   0   0   0   0   0   1   1   1   0   0   0   1
```

```
## 56   0   0   1   0   1   1   1   1   0   0   0   1
## 57   0   0   1   0   0   1   1   1   0   0   0   1
## 58   0   0   0   0   0   1   0   0   0   0   0   0
## 59   0   0   0   0   0   0   0   0   0   0   0   0
## 60   1   1   1   0   0   0   0   0   0   0   0   0
## 61   1   1   0   0   1   0   0   0   0   0   0   0
## 62   1   0   1   0   1   1   1   0   0   1   0   0
## 63   0   0   0   1   0   0   0   0   0   0   0   0
## 64   0   1   1   0   1   1   1   0   0   1   0   0
## 65   0   0   1   0   1   1   1   0   1   1   0   1
## 66   0   0   1   0   1   1   1   1   1   1   1   1
## 67   0   0   0   0   0   0   1   1   1   1   1   1
## 68   0   0   0   0   0   1   1   1   1   1   0   1
## 69   0   0   1   0   1   1   1   1   1   1   1   1
## 70   0   0   0   0   0   0   1   1   0   1   1   0
## 71   0   0   0   0   0   1   1   1   1   1   0   1
##
## $X
##       X X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11
## 1    0 31 64  1  0  1  0  0  1  0  1   0   0
## 2    1 32 62  1  0  1  0  0  0  1  1   0   0
## 3    2 13 67  1  0  0  1  0  1  0  1   0   0
## 4    3 31 59  1  0  1  0  0  0  1  0   0   1
## 5    4 31 59  1  0  0  1  0  1  0  0   1   0
## 6    5 29 55  1  0  0  1  0  1  0  1   0   0
## 7    6 29 63  1  0  0  1  0  0  1  0   0   1
## 8    7 28 53  1  0  1  0  0  1  0  0   0   1
## 9    8 25 53  1  0  1  0  0  0  1  1   0   0
## 10   9 25 53  1  0  1  0  0  0  1  0   0   1
## 11  10 23 50  1  0  1  0  0  1  0  1   0   0
## 12  11 24 52  1  0  1  0  0  0  1  0   1   0
## 13  12 22 57  1  0  1  0  0  1  0  0   1   0
## 14  13  1 56  1  0  0  1  0  0  1  1   0   0
## 15  14 21 48  1  0  0  0  1  0  1  0   0   1
## 16  15 20 46  1  0  1  0  0  0  1  1   0   0
## 17  16 23 50  1  0  1  0  0  0  1  1   0   0
## 18  17 18 45  1  0  0  1  0  1  0  0   1   0
## 19  18 19 46  1  0  1  0  0  0  1  1   0   0
## 20  19 19 49  1  0  1  0  0  1  0  1   0   0
## 21  20 17 43  1  0  1  0  0  1  0  0   1   0
## 22  21  9 49  1  0  1  0  0  1  0  0   0   1
## 23  22 16 45  1  0  1  0  0  1  0  0   1   0
## 24  23 15 44  1  0  1  0  0  1  0  0   1   0
## 25  24 15 43  1  0  0  1  0  0  1  0   1   0
## 26  25 15 41  1  0  1  0  0  1  0  0   0   1
## 27  26 13 47  1  0  1  0  0  1  0  1   0   0
## 28  27 11 38  1  0  0  1  0  0  1  0   1   0
## 29  28 10 38  1  0  1  0  0  0  1  0   0   1
## 30  29  7 39  1  0  0  1  0  1  0  0   0   1
## 31  30  8 34  1  0  0  1  0  1  0  0   1   0
## 32  31  8 33  1  0  0  1  0  1  0  0   0   1
## 33  32  8 37  1  0  0  1  0  1  0  0   0   1
## 34  33  8 36  1  0  1  0  0  0  1  0   1   0
## 35  34  8 33  1  0  0  1  0  0  1  0   0   1
```

```
## 36 35  5 43  1  0  1  0  0  1  0  0    0    1
## 37 36  5 44  0  1  0  0  1  0  1  0    0    1
## 38 37  7 53  0  1  1  0  0  1  0  0    1    0
## 39 38  6 37  0  1  1  0  0  1  0  1    0    0
## 40 39  6 34  0  1  1  0  0  1  0  1    0    0
## 41 40  5 31  0  1  1  0  0  1  0  0    1    0
## 42 41  4 31  0  1  1  0  0  0  1  0    1    0
## 43 42  5 47  0  1  1  0  0  1  0  0    1    0
## 44 43  5 53  0  1  0  0  1  0  1  1    0    0
## 45 44  3 38  0  1  1  0  0  0  1  0    0    1
## 46 45  3 42  0  1  0  1  0  0  1  0    1    0
## 47 46  3 38  0  1  0  0  1  1  0  0    0    1
## 48 47  1 35  0  1  1  0  0  0  1  0    0    1
## 49 48  4 36  0  1  1  0  0  1  0  0    1    0
## 50 49  3 31  0  1  0  1  0  0  1  0    1    0
## 51 50  4 29  0  1  0  1  0  1  0  0    0    1
## 52 51  4 29  0  1  1  0  0  1  0  0    0    1
## 53 52 10 38  0  1  1  0  0  0  1  0    0    1
## 54 53  3 29  0  1  1  0  0  1  0  0    0    1
## 55 54  3 34  0  1  1  0  0  1  0  0    0    1
## 56 55  3 38  0  1  1  0  0  1  0  0    1    0
## 57 56  3 33  0  1  1  0  0  1  0  0    1    0
## 58 57  3 33  0  1  0  1  0  1  0  0    0    1
## 59 58  2 30  0  1  0  1  0  1  0  0    1    0
## 60 59  2 31  0  1  1  0  0  0  1  0    1    0
## 61 60  2 34  0  1  1  0  0  0  1  0    0    1
## 62 61  2 32  0  1  1  0  0  0  1  0    1    0
## 63 62  2 29  0  1  0  1  0  0  1  0    1    0
## 64 63  2 45  0  1  1  0  0  0  1  0    1    0
## 65 64  2 28  0  1  1  0  0  1  0  0    0    1
## 66 65  1 43  0  1  1  0  0  1  0  0    0    1
## 67 66  1 35  0  1  1  0  0  1  0  0    1    0
## 68 67  1 26  0  1  1  0  0  1  0  0    0    1
## 69 68  1 38  0  1  1  0  0  1  0  0    0    1
## 70 69  1 31  0  1  1  0  0  0  1  0    1    0
## 71 70  1 26  0  1  1  0  0  1  0  0    1    0
```

Visualize data

```r
# Something is wrong with visualize net, needs debug, see below scripts for more info on plotting actua
visualize.net(net.list)
```
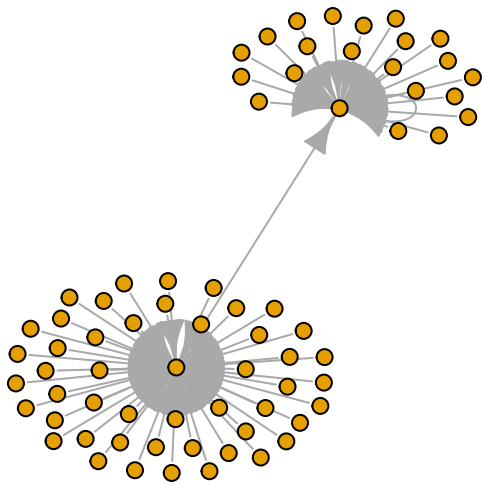
Load parameters

```r
parameters<-generate_default_parameters()
```

Update parameters

```r
new.parameters<-list(encoder_base="GATConv",
                     K=3L,
                     epoch_cluster=100L,
                     n_layers=1L,
                     use_mincut=T,
                     ae_type="ARGA",
                     custom_dataset="none",
                     learning_rate=1e-2,
                     lambda_kl=0.,
                     lambda_adv=0.001,
                     lambda_cluster=0.5)
parameters<-update.parameters(parameters,new.parameters)
```

Create design matrix to expand factors, update net.list

```r
# WILL DO, WIP!
```

Fit cluster, embedding, classification, generation, or link prediction model

```r
cluster.model<-cluster.model.fit(parameters, net.list)
```

Plot Objective Convergence

```
plot.diagnostics(cluster.model)
```

```
## Warning in melt(loss.log, id.vars = "epoch"): The melt generic in data.table
## has been passed a data.frame and will attempt to redirect to the relevant
## reshape2 method; please note that reshape2 is deprecated, and this redirection
## is now deprecated as well. To continue using melt methods from reshape2 while
## both libraries are attached, e.g. melt.list, you can prepend the namespace
## like reshape2::melt(loss.log). In the next version, this warning will become an
## error.
```

```
## Warning in melt(loss.log, id.vars = "epoch"): The melt generic in data.table
## has been passed a data.frame and will attempt to redirect to the relevant
## reshape2 method; please note that reshape2 is deprecated, and this redirection
## is now deprecated as well. To continue using melt methods from reshape2 while
## both libraries are attached, e.g. melt.list, you can prepend the namespace
## like reshape2::melt(loss.log). In the next version, this warning will become an
## error.
```


Summarize Results

```
results<-extract.results(cluster.model)
graphs<-extract.graphs(cluster.model)
```

```r
cl<-extract.clusters(cluster.model)
summary(cluster.model)
```

```
## [1] "Extracted 2 clusters:"
## cl
##  0  2
## 34 37
## [1] "Extracted low dimensional embeddings of shape 71 30"
## [1] "Clustering Vector:"
##  [1] 2 0 0 0 0 0 0 2 0 2 2 0 2 0 0 0 0 0 0 0 2 2 0 2 0 2 2 0 0 0 0 0 0 0 0 2 0 2
## [39] 2 2 2 2 2 0 2 0 0 2 2 0 0 2 2 2 2 2 2 0 0 2 2 2 0 2 2 2 2 2 2 2 2
## [1] "Fuzzy Cluster Assignment Matrix:"
## tensor([[ 0.4146, -0.7186,  0.7746],
##         [ 1.1437, -0.7913,  0.0164],
##         [ 2.3725, -0.9205, -1.2642],
##         [ 0.9234, -0.7735,  0.2459],
##         [ 1.7557, -0.8593, -0.6232],
##         [ 2.0872, -0.8938, -0.9672],
##         [ 1.3297, -0.8191, -0.1757],
##         [-0.1101, -0.6651,  1.3208],
##         [ 0.6412, -0.7480,  0.5422],
##         [ 0.5618, -0.7358,  0.6249],
##         [-0.1842, -0.6608,  1.3988],
##         [ 0.8353, -0.7689,  0.3399],
##         [-0.1199, -0.6704,  1.3329],
##         [ 2.2276, -0.9103, -1.1119],
##         [ 1.3785, -0.8216, -0.2267],
##         [ 1.0322, -0.7869,  0.1348],
##         [ 0.9332, -0.7746,  0.2365],
##         [ 2.8129, -0.9674, -1.7246],
##         [ 1.0306, -0.7865,  0.1357],
##         [ 0.7654, -0.7578,  0.4101],
##         [-0.1119, -0.6690,  1.3239],
##         [ 0.2961, -0.7127,  0.8995],
##         [ 0.7645, -0.7519,  0.4087],
##         [ 0.2024, -0.7003,  0.9971],
##         [ 2.2936, -0.9177, -1.1802],
##         [ 0.2680, -0.7097,  0.9289],
##         [ 0.1346, -0.6932,  1.0673],
##         [ 1.7198, -0.8599, -0.5828],
##         [ 0.6065, -0.7419,  0.5774],
##         [ 1.8473, -0.8688, -0.7177],
##         [ 1.6326, -0.8495, -0.4936],
##         [ 2.1456, -0.9039, -1.0271],
##         [ 1.5097, -0.8373, -0.3658],
##         [ 0.7251, -0.7572,  0.4551],
##         [ 2.2226, -0.9115, -1.1069],
##         [ 0.0883, -0.6872,  1.1147],
##         [ 1.0861, -0.7945,  0.0805],
##         [-0.0328, -0.6797,  1.2426],
##         [-0.3595, -0.6472,  1.5822],
##         [-0.6832, -0.6141,  1.9193],
##         [-0.1632, -0.6643,  1.3773],
##         [ 0.5386, -0.7387,  0.6489],
```

```
##           [-0.1069, -0.6660,  1.3183],
##           [ 1.5003, -0.8262, -0.3529],
##           [ 0.5540, -0.7444,  0.6348],
##           [ 1.6035, -0.8520, -0.4585],
##           [ 0.9172, -0.7729,  0.2530],
##           [ 0.2026, -0.7066,  1.0001],
##           [-0.8606, -0.5966,  2.1041],
##           [ 2.0844, -0.9001, -0.9618],
##           [ 0.8510, -0.7720,  0.3208],
##           [-0.6035, -0.6215,  1.8362],
##           [ 0.3755, -0.7156,  0.8205],
##           [-0.3260, -0.6496,  1.5461],
##           [-0.5880, -0.6232,  1.8203],
##           [-0.7779, -0.6051,  2.0186],
##           [-0.9081, -0.5930,  2.1547],
##           [ 1.9467, -0.8829, -0.8217],
##           [ 2.7393, -0.9632, -1.6480],
##           [ 0.4957, -0.7400,  0.6965],
##           [-0.7563, -0.6214,  2.0033],
##           [-0.5862, -0.6323,  1.8228],
##           [ 2.8362, -0.9774, -1.7453],
##           [-0.3541, -0.6503,  1.5803],
##           [-0.6387, -0.6197,  1.8730],
##           [-0.8923, -0.5969,  2.1386],
##           [-1.2164, -0.5642,  2.4758],
##           [-1.0188, -0.5828,  2.2688],
##           [-1.6128, -0.5283,  2.8897],
##           [-0.2097, -0.6681,  1.4293],
##           [-1.3278, -0.5538,  2.5920]])
## [1] "Generated and Real Networks:"
## $A.pred
## IGRAPH f8349b9 DN-- 71 2411 --
## + attr: name (v/c), V1 (v/n), V2 (v/n), V3 (v/n), V4 (v/n), V5 (v/n),
## | V6 (v/n), V7 (v/n), V8 (v/n), V9 (v/n), V10 (v/n), V11 (v/n), V12
## | (v/n)
## + edges from f8349b9 (vertex names):
##  [1] 1->1  1->2  1->3  1->4  1->5  1->6  1->8  1->10 1->14 1->15 1->16 1->17
## [13] 1->18 1->19 1->20 1->23 1->24 1->25 1->27 1->29 1->30 1->36 1->43 1->44
## [25] 1->47 1->53 1->59 2->1  2->2  2->3  2->4  2->5  2->6  2->7  2->9  2->10
## [37] 2->12 2->14 2->15 2->16 2->17 2->18 2->19 2->20 2->23 2->25 2->28 2->29
## [49] 2->30 2->31 2->32 2->33 2->34 2->35 2->37 2->42 2->44 2->45 2->46 2->47
## [61] 2->50 2->51 2->53 2->58 2->59 2->60 2->63 3->1  3->2  3->3  3->4  3->5
## + ... omitted several edges
##
## $A.true
## IGRAPH 0f02842 DN-- 71 1505 --
## + attr: name (v/c), V1 (v/n), V2 (v/n), V3 (v/n), V4 (v/n), V5 (v/n),
## | V6 (v/n), V7 (v/n), V8 (v/n), V9 (v/n), V10 (v/n), V11 (v/n), V12
## | (v/n)
## + edges from 0f02842 (vertex names):
##  [1] 1->1  1->2  1->4  1->5  1->8  1->11 1->16 1->17 1->19 1->20 1->21 1->22
## [13] 1->23 1->24 1->26 1->27 1->29 1->30 1->36 1->39 1->41 1->43 1->54 2->1
## [25] 2->2  2->3  2->4  2->6  2->7  2->10 2->12 2->15 2->16 2->17 2->19 2->20
## [37] 2->22 2->24 2->26 2->27 2->29 2->34 2->42 2->43 2->44 2->48 2->53 2->64
```

```
## [49] 3->2  3->3  3->4  3->6  3->14 3->17 3->18 3->19 3->23 3->25 3->28 3->30
## [61] 4->1  4->2  4->3  4->4  4->6  4->9  4->12 4->13 4->14 4->16 4->17 4->19
## + ... omitted several edges
```

Visualize Results

```
plot(cluster.model)
```

Predicted Network   **Original Network**
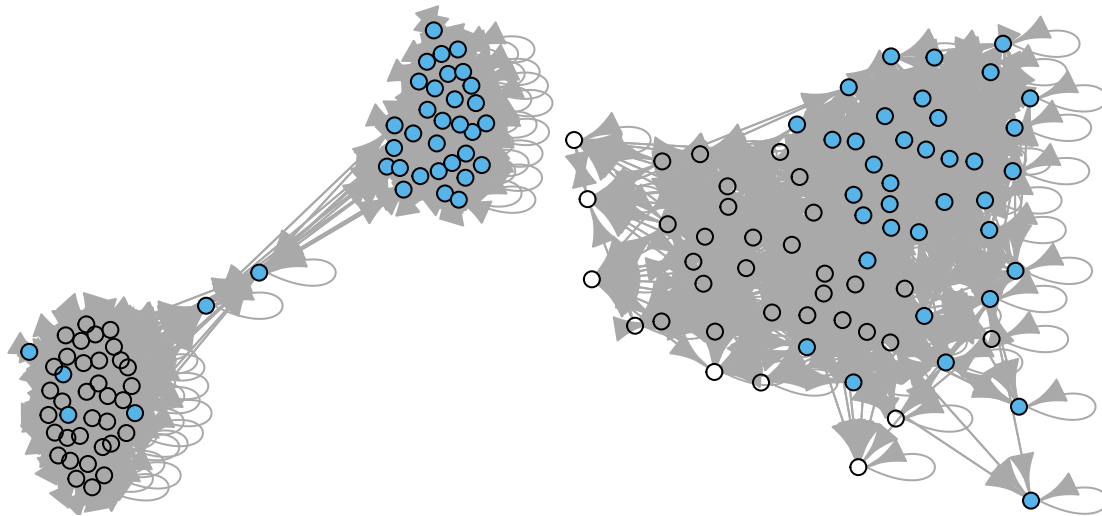
Interpret

Attention between Two Individuals

```
attention.matrices<-visualize.attention(cluster.model,weight.scaling.factor = 4)
```
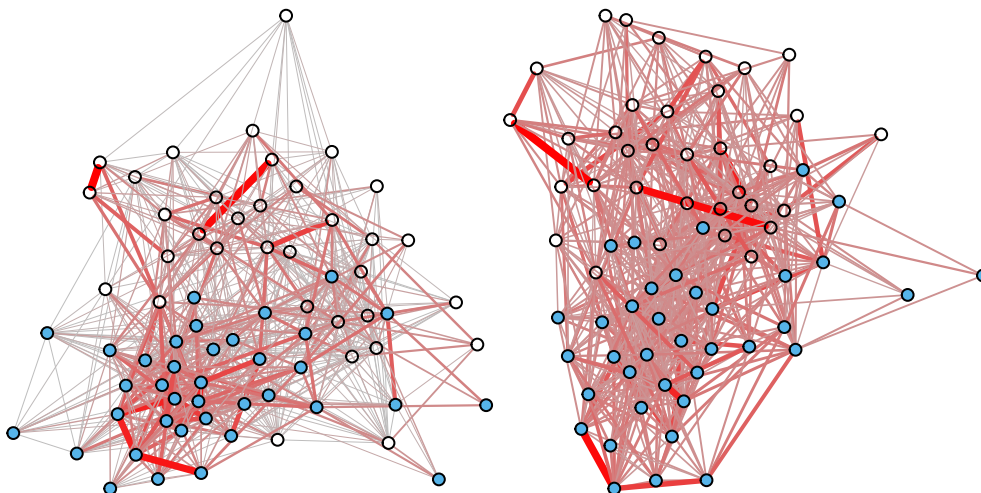

Important Samples

13

and Features per Cluster Assignment

```
attributions<-interpret.predictors(cluster.model)
```


14
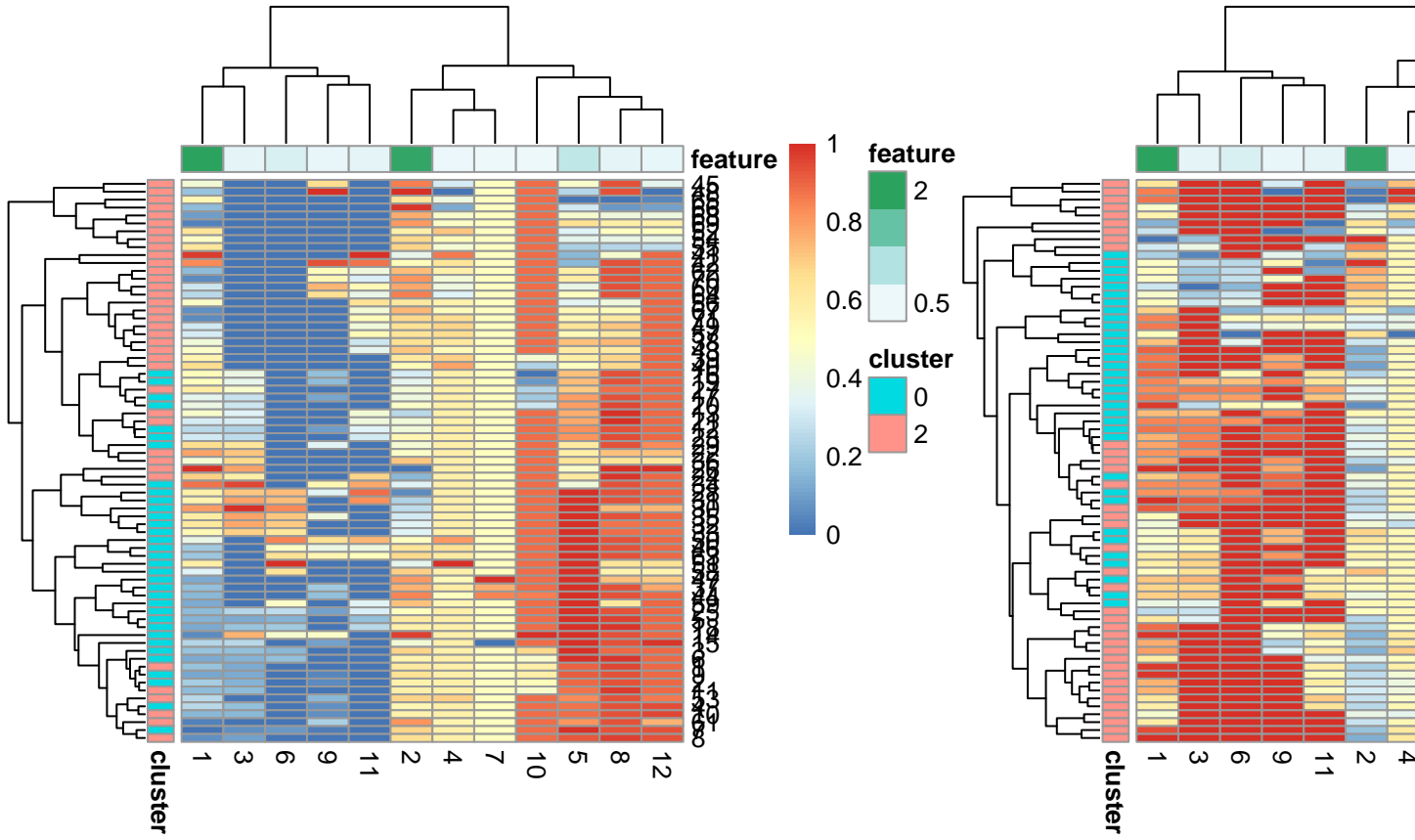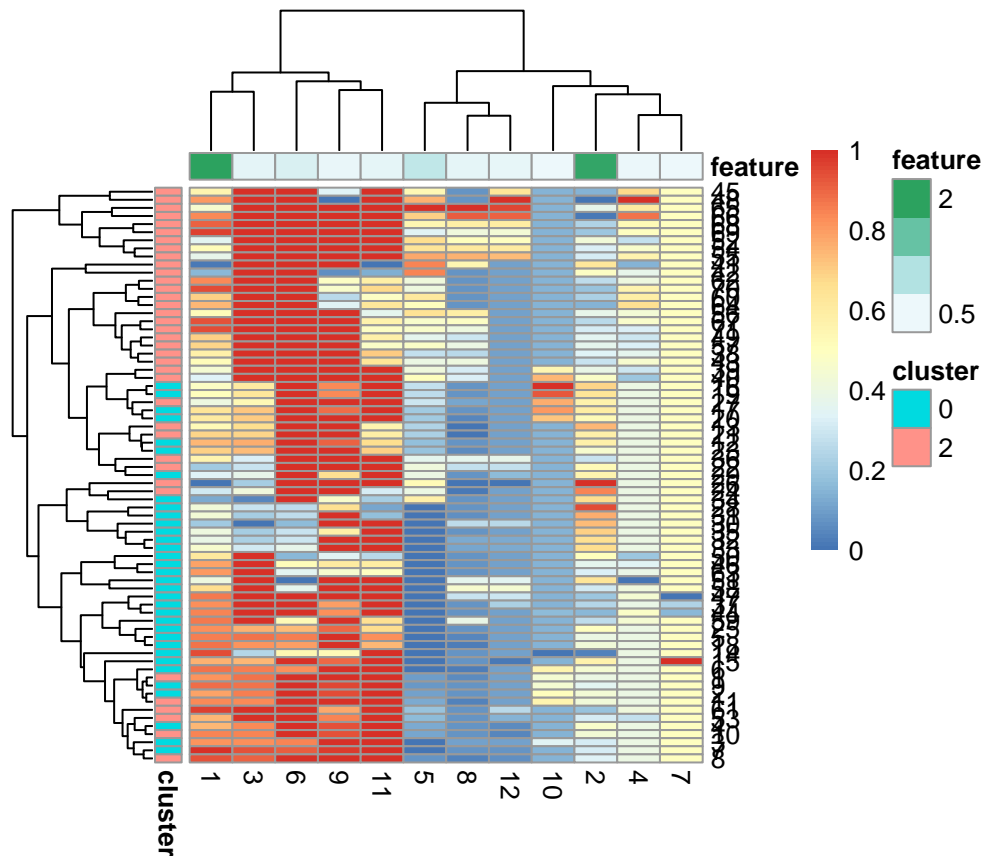
```
parameters.2<-update.parameters(parameters,list(encoder_base="GCNConv"))
cluster.model.2<-cluster.model.fit(parameters.2, net.list)
```

Please run: pip install git+https://github.com/rusty1s/pytorch_geometric.git for motif visualization:

```
motif.graphs<-extract.motifs(cluster.model.2)
cl<-extract.clusters(cluster.model.2)
vis.motif(motif.graphs,61,cl,threshold=0.4)
```

```
## Warning in vattrs[[name]][index] <- value: number of items to replace is not a
## multiple of replacement length
```
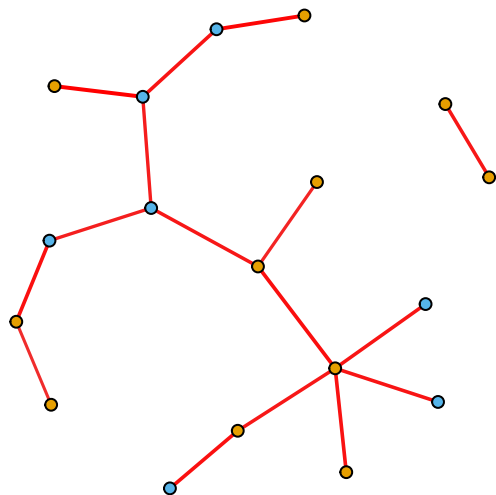
```
##               [,1]      [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9]      [,10]
##  [1,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [2,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [3,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [4,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [5,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [6,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [7,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [8,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##  [9,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [10,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [11,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [12,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [13,] 0.0000000 0.4581873    0    0    0    0    0    0    0 0.0000000
## [14,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [15,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [16,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [17,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [18,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [19,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [20,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [21,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [22,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [23,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [24,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [25,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [26,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [27,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [28,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [29,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [30,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [31,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [32,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [33,] 0.4720956 0.0000000    0    0    0    0    0    0    0 0.4646811
## [34,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [35,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
## [36,] 0.0000000 0.0000000    0    0    0    0    0    0    0 0.0000000
##           [,11] [,12]     [,13]      [,14] [,15] [,16] [,17] [,18] [,19]
##  [1,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [2,] 0.0000000     0 0.4581873 0.0000000     0     0     0     0     0
##  [3,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [4,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [5,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [6,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [7,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [8,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
##  [9,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [10,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [11,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [12,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [13,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [14,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [15,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
## [16,] 0.0000000     0 0.0000000 0.0000000     0     0     0     0     0
```

```
## [17,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [18,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [19,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [20,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [21,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [22,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [23,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [24,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [25,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [26,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [27,] 0.4228493        0 0.0000000 0.0000000        0        0        0        0        0
## [28,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [29,] 0.0000000        0 0.0000000 0.4786376        0        0        0        0        0
## [30,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [31,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [32,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [33,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [34,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [35,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
## [36,] 0.0000000        0 0.0000000 0.0000000        0        0        0        0        0
##            [,20]      [,21] [,22] [,23] [,24]      [,25]      [,26]      [,27]
##  [1,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [2,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [3,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [4,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [8,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [10,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [11,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.4228493
## [12,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [16,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [19,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [20,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.4595252
## [21,] 0.0000000 0.0000000     0     0     0 0.0000000 0.4016918 0.0000000
## [22,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [25,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [26,] 0.0000000 0.4016918     0     0     0 0.0000000 0.0000000 0.0000000
## [27,] 0.4595252 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [30,] 0.4421084 0.0000000     0     0     0 0.0000000 0.0000000 0.0000000
## [31,] 0.4368208 0.0000000     0     0     0 0.0000000 0.4785240 0.0000000
## [32,] 0.0000000 0.0000000     0     0     0 0.5054195 0.0000000 0.0000000
## [33,] 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000 0.4849239
```

```
## [34,] 0.0000000 0.0000000        0       0       0 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.0000000        0       0       0 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000        0       0       0 0.0000000 0.0000000 0.0000000
##             [,28]      [,29]     [,30]     [,31]     [,32]      [,33] [,34] [,35]
##  [1,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4720956     0     0
##  [2,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [5,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
##  [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4646811     0     0
## [11,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [14,] 0.0000000 0.4786376 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [16,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [18,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [19,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [20,] 0.0000000 0.0000000 0.4421084 0.4368208 0.0000000 0.0000000     0     0
## [21,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [22,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [23,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.5054195 0.0000000     0     0
## [26,] 0.0000000 0.0000000 0.0000000 0.4785240 0.0000000 0.0000000     0     0
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4849239     0     0
## [28,] 0.0000000 0.0000000 0.5223777 0.0000000 0.0000000 0.0000000     0     0
## [29,] 0.0000000 0.6497187 0.0000000 0.0000000 0.0000000 0.4575843     0     0
## [30,] 0.5223777 0.0000000 0.0000000 0.0000000 0.4663638 0.0000000     0     0
## [31,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [32,] 0.0000000 0.0000000 0.4663638 0.0000000 0.0000000 0.0000000     0     0
## [33,] 0.0000000 0.4575843 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [35,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4674311     0     0
##             [,36]
##  [1,] 0.0000000
##  [2,] 0.0000000
##  [3,] 0.0000000
##  [4,] 0.0000000
##  [5,] 0.0000000
##  [6,] 0.0000000
##  [7,] 0.0000000
##  [8,] 0.0000000
##  [9,] 0.0000000
## [10,] 0.0000000
## [11,] 0.0000000
## [12,] 0.0000000
## [13,] 0.0000000
```

```
## [14,] 0.0000000
## [15,] 0.0000000
## [16,] 0.0000000
## [17,] 0.0000000
## [18,] 0.0000000
## [19,] 0.0000000
## [20,] 0.0000000
## [21,] 0.0000000
## [22,] 0.0000000
## [23,] 0.0000000
## [24,] 0.0000000
## [25,] 0.0000000
## [26,] 0.0000000
## [27,] 0.0000000
## [28,] 0.0000000
## [29,] 0.0000000
## [30,] 0.0000000
## [31,] 0.0000000
## [32,] 0.0000000
## [33,] 0.4674311
## [34,] 0.0000000
## [35,] 0.0000000
## [36,] 0.0000000
```

```r
vis.motif(motif.graphs,8,cl,threshold=0.4)
```

```
## Warning in vattrs[[name]][index] <- value: number of items to replace is not a
## multiple of replacement length
```



```
##             [,1]      [,2]      [,3]      [,4]      [,5]      [,6]      [,7]
## [1,] 0.6949778 0.7265647 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [2,] 0.7265647 0.0000000 0.0000000 0.0000000 0.0000000 0.4957911 0.0000000
## [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4494246
## [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4117040 0.0000000 0.0000000
## [5,] 0.0000000 0.0000000 0.0000000 0.4117040 0.6442088 0.0000000 0.0000000
## [6,] 0.0000000 0.4957911 0.0000000 0.0000000 0.0000000 0.6751018 0.0000000
## [7,] 0.0000000 0.0000000 0.4494246 0.0000000 0.0000000 0.0000000 0.6116524
## [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
```

```
## [10,] 0.4908710 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [11,] 0.5077062 0.0000000 0.0000000 0.0000000 0.4725852 0.0000000 0.0000000
## [12,] 0.5357548 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000 0.4509288 0.0000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.5077072 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [16,] 0.4996319 0.0000000 0.0000000 0.4325045 0.0000000 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4699971 0.0000000 0.0000000
## [19,] 0.0000000 0.0000000 0.4506514 0.0000000 0.0000000 0.0000000 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [21,] 0.0000000 0.4873397 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [22,] 0.4829085 0.7254215 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [23,] 0.4786462 0.4874950 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.4492922 0.0000000 0.0000000 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4808059 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.4773931 0.0000000 0.0000000 0.0000000 0.0000000 0.4820920
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4687101
## [31,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.5074913
## [32,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [33,] 0.0000000 0.0000000 0.4515150 0.0000000 0.0000000 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4436469 0.0000000 0.5184674
## [35,] 0.5049345 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.5393717 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [39,] 0.4503711 0.4815880 0.0000000 0.0000000 0.5313103 0.0000000 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [43,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4548582 0.0000000 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.5114491 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.5086613
## [49,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [52,] 0.0000000 0.5010334 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [55,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4861274
## [57,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [58,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [59,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [60,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.5193277
## [61,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [62,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
```

```
## [64,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##             [,8]      [,9]     [,10]     [,11]     [,12]     [,13]     [,14]
##  [1,] 0.0000000 0.0000000 0.4908710 0.5077062 0.5357548 0.0000000 0.0000000
##  [2,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4509288
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000 0.0000000 0.4725852 0.0000000 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [8,] 0.5413286 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [10,] 0.0000000 0.0000000 0.0000000 0.5041702 0.5115602 0.0000000 0.0000000
## [11,] 0.0000000 0.0000000 0.5041702 0.0000000 0.0000000 0.0000000 0.0000000
## [12,] 0.0000000 0.0000000 0.5115602 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4065867
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4065867 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [16,] 0.0000000 0.0000000 0.5267328 0.0000000 0.5130697 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.4590470 0.0000000 0.0000000 0.0000000
## [19,] 0.0000000 0.0000000 0.0000000 0.0000000 0.5054573 0.0000000 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [21,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [22,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000 0.5061330 0.0000000 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [25,] 0.4814661 0.0000000 0.0000000 0.0000000 0.4849244 0.0000000 0.4254767
## [26,] 0.0000000 0.4955610 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.5072840 0.0000000 0.0000000
## [28,] 0.4224497 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [31,] 0.0000000 0.0000000 0.0000000 0.5388948 0.0000000 0.0000000 0.0000000
## [32,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [33,] 0.0000000 0.5054083 0.0000000 0.4723003 0.0000000 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.4993960 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [40,] 0.4298447 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.4542302 0.0000000 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [43,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.4893907 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [49,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [51,] 0.0000000 0.4920028 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
```

```
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [53,] 0.0000000 0.4908194 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [55,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [57,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [58,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [59,] 0.0000000 0.4986616 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [60,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [61,] 0.0000000 0.0000000 0.0000000 0.5369460 0.0000000 0.0000000 0.0000000
## [62,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [64,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##            [,15]     [,16] [,17]     [,18]     [,19] [,20]     [,21]     [,22]
##  [1,] 0.0000000 0.4996319     0 0.0000000 0.0000000     0 0.0000000 0.4829085
##  [2,] 0.5077072 0.0000000     0 0.0000000 0.0000000     0 0.4873397 0.7254215
##  [3,] 0.0000000 0.0000000     0 0.0000000 0.4506514     0 0.0000000 0.0000000
##  [4,] 0.0000000 0.4325045     0 0.0000000 0.0000000     0 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000     0 0.4699971 0.0000000     0 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
##  [8,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [10,] 0.0000000 0.5267328     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [11,] 0.0000000 0.0000000     0 0.4590470 0.0000000     0 0.0000000 0.0000000
## [12,] 0.0000000 0.5130697     0 0.0000000 0.5054573     0 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [16,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000     0 0.0000000 0.7242762     0 0.0000000 0.0000000
## [19,] 0.0000000 0.0000000     0 0.7242762 0.0000000     0 0.4839371 0.0000000
## [20,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [21,] 0.0000000 0.0000000     0 0.0000000 0.4839371     0 0.6416107 0.0000000
## [22,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [25,] 0.0000000 0.5121178     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [27,] 0.5230365 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000     0 0.4551012 0.0000000     0 0.0000000 0.0000000
## [30,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.4990283 0.0000000
## [31,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.5212830 0.0000000
## [32,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [33,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [35,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [36,] 0.5163572 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000     0 0.0000000 0.0000000     0 0.0000000 0.0000000
```
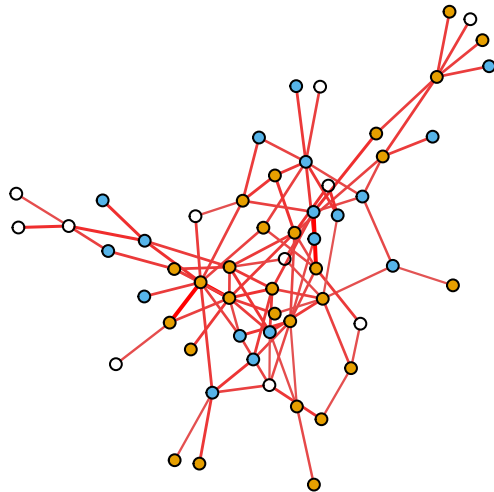
```
## [40,] 0.0000000 0.0000000        0 0.5085890 0.0000000        0 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000        0 0.0000000 0.4693757        0 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [43,] 0.4799574 0.4098530        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [44,] 0.4212999 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [49,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [51,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [52,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.4189967 0.0000000
## [53,] 0.0000000 0.0000000        0 0.0000000 0.5457364        0 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.4338508
## [55,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [56,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [57,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [58,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [59,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [60,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [61,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [62,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [63,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [64,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
## [65,] 0.0000000 0.0000000        0 0.0000000 0.0000000        0 0.0000000 0.0000000
##           [,23]      [,24]     [,25]     [,26]      [,27]      [,28]      [,29]
##  [1,] 0.4786462 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
##  [2,] 0.4874950 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.4773931
##  [3,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
##  [4,] 0.0000000 0.4492922 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000 0.0000000 0.000000 0.4808059 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.4820920
##  [8,] 0.0000000 0.0000000 0.4814661 0.000000 0.0000000 0.4224497 0.0000000
##  [9,] 0.0000000 0.0000000 0.0000000 0.495561 0.0000000 0.0000000 0.0000000
## [10,] 0.5061330 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [11,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [12,] 0.0000000 0.0000000 0.4849244 0.000000 0.5072840 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000 0.4254767 0.000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.000000 0.5230365 0.0000000 0.0000000
## [16,] 0.0000000 0.0000000 0.5121178 0.000000 0.0000000 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.4551012
## [19,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [21,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [22,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
```

```
## [28,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [30,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [31,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [32,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [33,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.0000000 0.4287046 0.000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.4379485 0.000000 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [43,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.5196504 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [49,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [55,] 0.5077840 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [57,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [58,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [59,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [60,] 0.0000000 0.0000000 0.4083211 0.000000 0.0000000 0.0000000 0.0000000
## [61,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [62,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [64,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.000000 0.0000000 0.0000000 0.0000000
##            [,30]      [,31]      [,32]      [,33]      [,34]      [,35]      [,36]
##  [1,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.5049345 0.0000000
##  [2,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [3,] 0.0000000 0.0000000 0.0000000 0.4515150 0.0000000 0.0000000 0.0000000
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4436469 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [7,] 0.4687101 0.5074913 0.0000000 0.0000000 0.5184674 0.0000000 0.0000000
##  [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000 0.0000000 0.5054083 0.0000000 0.0000000 0.0000000
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [11,] 0.0000000 0.5388948 0.0000000 0.4723003 0.0000000 0.0000000 0.0000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.5163572
```

```
## [16,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [19,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [21,] 0.4990283 0.5212830 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [22,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.4287046 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [31,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [32,] 0.0000000 0.0000000 0.0000000 0.4989023 0.0000000 0.0000000 0.0000000
## [33,] 0.0000000 0.0000000 0.4989023 0.0000000 0.0000000 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [43,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [49,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [55,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [57,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [58,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [59,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [60,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [61,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [62,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [64,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##            [,37]     [,38]     [,39]     [,40]     [,41] [,42]     [,43]
##  [1,] 0.0000000 0.0000000 0.4503711 0.0000000 0.0000000     0 0.0000000
##  [2,] 0.5393717 0.0000000 0.4815880 0.0000000 0.0000000     0 0.0000000
##  [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
```

```
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
##  [5,] 0.0000000 0.0000000 0.5313103 0.0000000 0.0000000          0 0.4548582
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
##  [8,] 0.0000000 0.0000000 0.0000000 0.4298447 0.0000000          0 0.0000000
##  [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [10,] 0.4993960 0.0000000 0.0000000 0.0000000 0.4542302          0 0.0000000
## [11,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.4799574
## [16,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.4098530
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.5085890 0.0000000          0 0.0000000
## [19,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4693757          0 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [21,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [22,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4379485          0 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [28,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.5196504
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [31,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [32,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [33,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [35,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.4741897
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [41,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [43,] 0.0000000 0.0000000 0.4741897 0.0000000 0.0000000          0 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [49,] 0.5482449 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [55,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
## [57,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000          0 0.0000000
```

```
## [58,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [59,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [60,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [61,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [62,] 0.5537853 0.4332898 0.0000000 0.0000000 0.0000000        0 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [64,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0 0.0000000
##            [,44] [,45]     [,46]     [,47]     [,48]     [,49] [,50]     [,51]
##    [1,] 0.0000000     0 0.0000000 0.5114491 0.0000000 0.0000000     0 0.0000000
##    [2,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [3,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [4,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [5,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [6,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [7,] 0.0000000     0 0.0000000 0.0000000 0.5086613 0.0000000     0 0.0000000
##    [8,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
##    [9,] 0.0000000     0 0.4893907 0.0000000 0.0000000 0.0000000     0 0.4920028
## [10,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [11,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [12,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [13,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [14,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [15,] 0.4212999     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [16,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [17,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [18,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [19,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [20,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [21,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [22,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [23,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [24,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [25,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [26,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [27,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [28,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [29,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [30,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [31,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [32,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [33,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [34,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [35,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [36,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [37,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.5482449     0 0.0000000
## [38,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [39,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [40,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [41,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [42,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [43,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [44,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
## [45,] 0.0000000     0 0.0000000 0.0000000 0.0000000 0.0000000     0 0.0000000
```

```
## [46,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [47,] 0.0000000         0 0.0000000 0.6692761 0.0000000 0.0000000         0 0.0000000
## [48,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [49,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [50,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [51,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [52,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [53,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [54,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [55,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [56,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [57,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [58,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [59,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [60,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [61,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [62,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [63,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [64,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
## [65,] 0.0000000         0 0.0000000 0.0000000 0.0000000 0.0000000         0 0.0000000
##           [,52]     [,53]     [,54]     [,55]     [,56] [,57] [,58]     [,59]
##  [1,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [2,] 0.5010334 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [5,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.4861274     0     0 0.0000000
##  [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
##  [9,] 0.0000000 0.4908194 0.0000000 0.0000000 0.0000000     0     0 0.4986616
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [11,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [16,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [17,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [18,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [19,] 0.0000000 0.5457364 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [20,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [21,] 0.4189967 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [22,] 0.0000000 0.0000000 0.4338508 0.0000000 0.0000000     0     0 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.5077840 0.0000000     0     0 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [28,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [31,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [32,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
## [33,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000     0     0 0.0000000
```

```
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [35,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [41,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [43,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [44,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [49,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [50,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [55,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [56,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [57,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [58,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [59,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [60,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [61,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [62,] 0.0000000 0.0000000 0.0000000 0.4807629 0.0000000        0        0 0.0000000
## [63,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [64,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
## [65,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000        0        0 0.0000000
##            [,60]     [,61]     [,62] [,63]     [,64] [,65]
##  [1,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [2,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [3,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [4,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [5,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [6,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [7,] 0.5193277 0.0000000 0.0000000     0 0.0000000     0
##  [8,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
##  [9,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [10,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [11,] 0.0000000 0.5369460 0.0000000     0 0.0000000     0
## [12,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [13,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [14,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [15,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [16,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [17,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [18,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [19,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [20,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
## [21,] 0.0000000 0.0000000 0.0000000     0 0.0000000     0
```

```
## [22,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [23,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [24,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [25,] 0.4083211 0.0000000 0.0000000        0 0.0000000        0
## [26,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [27,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [28,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [29,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [30,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [31,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [32,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [33,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [34,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [35,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [36,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [37,] 0.0000000 0.0000000 0.5537853        0 0.0000000        0
## [38,] 0.0000000 0.0000000 0.4332898        0 0.0000000        0
## [39,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [40,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [41,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [42,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [43,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [44,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [45,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [46,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [47,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [48,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [49,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [50,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [51,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [52,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [53,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [54,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [55,] 0.0000000 0.0000000 0.4807629        0 0.0000000        0
## [56,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [57,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [58,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [59,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [60,] 0.0000000 0.5481769 0.0000000        0 0.0000000        0
## [61,] 0.5481769 0.7570822 0.0000000        0 0.0000000        0
## [62,] 0.0000000 0.0000000 0.0000000        0 0.5488373        0
## [63,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
## [64,] 0.0000000 0.0000000 0.5488373        0 0.0000000        0
## [65,] 0.0000000 0.0000000 0.0000000        0 0.0000000        0
```
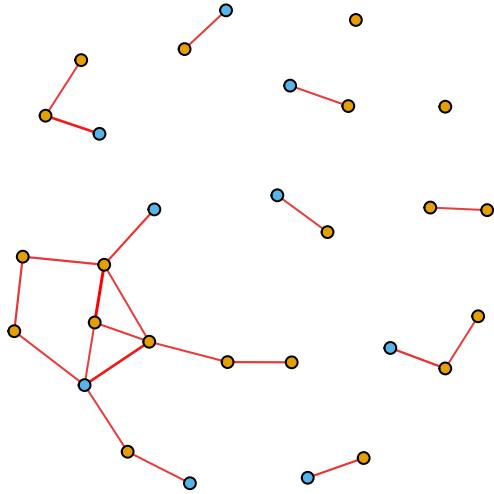
```r
vis.motif(motif.graphs,5,cl,threshold=0.5, weight.scaling.factor=1.5)
```

```
## Warning in vattrs[[name]][index] <- value: number of items to replace is not a
## multiple of replacement length
```

```
##              [,1]      [,2] [,3] [,4]      [,5]      [,6]      [,7] [,8] [,9]
##  [1,] 0.6045539 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
##  [2,] 0.0000000 0.0000000    0    0 0.6544513 0.0000000 0.0000000    0    0
##  [3,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
##  [4,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
##  [5,] 0.0000000 0.6544513    0    0 0.0000000 0.5095003 0.0000000    0    0
##  [6,] 0.0000000 0.0000000    0    0 0.5095003 0.0000000 0.0000000    0    0
##  [7,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.6298417    0    0
##  [8,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
##  [9,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [10,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [11,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [12,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [13,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [14,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [15,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [16,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [17,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [18,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [19,] 0.0000000 0.5153923    0    0 0.5018132 0.0000000 0.0000000    0    0
## [20,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [21,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [22,] 0.0000000 0.5011982    0    0 0.0000000 0.0000000 0.0000000    0    0
## [23,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [24,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [25,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [26,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [27,] 0.6507708 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [28,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [29,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [30,] 0.0000000 0.0000000    0    0 0.0000000 0.5403580 0.0000000    0    0
## [31,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [32,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [33,] 0.5035376 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [34,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [35,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [36,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
## [37,] 0.0000000 0.0000000    0    0 0.0000000 0.0000000 0.0000000    0    0
```

```
## [38,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [39,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [40,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [41,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [42,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [43,] 0.0000000 0.5098855        0        0 0.0000000 0.0000000 0.0000000        0        0
## [44,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [45,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [46,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [47,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [48,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [49,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [50,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [51,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [52,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [53,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [54,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [55,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [56,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [57,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [58,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [59,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [60,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [61,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [62,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [63,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [64,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [65,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
## [66,] 0.0000000 0.0000000        0        0 0.5019772 0.0000000 0.0000000        0        0
## [67,] 0.0000000 0.0000000        0        0 0.0000000 0.0000000 0.0000000        0        0
##            [,10]     [,11]     [,12] [,13] [,14] [,15]      [,16]      [,17] [,18]
##  [1,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [2,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [3,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [4,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [5,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [6,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [7,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [8,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
##  [9,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [10,] 0.0000000 0.0000000 0.0000000     0     0     0 0.5036972 0.0000000     0
## [11,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.5571651     0
## [12,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [13,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [14,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [15,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [16,] 0.5036972 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [17,] 0.0000000 0.5571651 0.0000000     0     0     0 0.0000000 0.0000000     0
## [18,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [19,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [20,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [21,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.5013228     0
## [22,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
## [23,] 0.0000000 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000     0
```

## [24,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [25,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [26,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [27,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [28,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [29,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [30,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [31,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [32,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [33,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [34,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [35,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [36,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [37,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [38,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [39,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [40,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [41,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [42,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [43,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [44,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [45,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [46,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [47,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [48,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [49,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [50,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [51,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [52,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [53,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [54,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [55,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [56,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [57,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [58,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [59,]	0.0000000	0.0000000	0.5392568	0	0	0	0.0000000	0.0000000	0
## [60,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [61,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [62,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [63,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [64,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [65,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [66,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0
## [67,]	0.0000000	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000	0

##	[,19]	[,20]	[,21]	[,22]	[,23]	[,24]	[,25]	[,26]	[,27]
## [1,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.6507708
## [2,]	0.5153923	0	0.0000000	0.5011982	0	0	0	0.0000000	0.0000000
## [3,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [4,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [5,]	0.5018132	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [6,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [7,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [8,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000
## [9,]	0.0000000	0	0.0000000	0.0000000	0	0	0	0.0000000	0.0000000

```
## [10,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [11,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [12,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [13,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [14,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [15,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [16,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [17,] 0.0000000    0 0.5013228 0.0000000    0    0    0 0.0000000 0.0000000
## [18,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [19,] 0.0000000    0 0.0000000 0.7407911    0    0    0 0.0000000 0.0000000
## [20,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [21,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [22,] 0.7407911    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [23,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [24,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [25,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [26,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [27,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [28,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [29,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [30,] 0.0000000    0 0.0000000 0.5436807    0    0    0 0.0000000 0.0000000
## [31,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [32,] 0.0000000    0 0.0000000 0.5423138    0    0    0 0.0000000 0.0000000
## [33,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [34,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [35,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [36,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [37,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [38,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [39,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [40,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [41,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [42,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.5120444 0.0000000
## [43,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [44,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [45,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [46,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [47,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [48,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [49,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [50,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [51,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [52,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [53,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [54,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [55,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [56,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [57,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [58,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [59,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [60,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [61,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [62,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
## [63,] 0.0000000    0 0.0000000 0.0000000    0    0    0 0.0000000 0.0000000
```

```
## [64,] 0.0000000     0 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000
## [65,] 0.0000000     0 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000
## [66,] 0.0000000     0 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000
## [67,] 0.0000000     0 0.0000000 0.0000000     0     0     0 0.0000000 0.0000000
##          [,28]    [,29]      [,30] [,31]     [,32]      [,33] [,34] [,35]     [,36]
##  [1,]        0 0.000000 0.0000000     0 0.0000000 0.5035376     0     0 0.0000000
##  [2,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [3,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [4,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [5,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [6,]        0 0.000000 0.5403580     0 0.0000000 0.0000000     0     0 0.0000000
##  [7,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [8,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
##  [9,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [10,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [11,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [12,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [13,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [14,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [15,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [16,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [17,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [18,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [19,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [20,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [21,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [22,]        0 0.000000 0.5436807     0 0.5423138 0.0000000     0     0 0.0000000
## [23,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [24,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [25,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [26,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [27,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [28,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [29,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [30,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [31,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [32,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [33,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [34,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [35,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [36,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.7309772
## [37,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [38,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [39,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [40,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [41,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [42,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [43,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [44,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [45,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [46,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [47,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [48,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
## [49,]        0 0.000000 0.0000000     0 0.0000000 0.0000000     0     0 0.0000000
```

```
## [50,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [51,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [52,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [53,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [54,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [55,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [56,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [57,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [58,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [59,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [60,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [61,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [62,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [63,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [64,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [65,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [66,]      0 0.508768 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
## [67,]      0 0.000000 0.0000000      0 0.0000000 0.0000000      0      0 0.0000000
##         [,37] [,38] [,39] [,40] [,41]     [,42]      [,43] [,44] [,45] [,46] [,47]
##  [1,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [2,]      0     0     0     0     0 0.0000000 0.5098855      0     0     0     0
##  [3,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [4,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [5,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [6,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [7,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [8,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
##  [9,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [10,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [11,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [12,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [13,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [14,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [15,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [16,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [17,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [18,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [19,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [20,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [21,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [22,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [23,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [24,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [25,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [26,]      0     0     0     0     0 0.5120444 0.0000000      0     0     0     0
## [27,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [28,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [29,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [30,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [31,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [32,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [33,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [34,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
## [35,]      0     0     0     0     0 0.0000000 0.0000000      0     0     0     0
```

```
## [36,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [37,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [38,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [39,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [40,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [41,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [42,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [43,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [44,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [45,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [46,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [47,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [48,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [49,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [50,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [51,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [52,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [53,]      0      0      0      0      0 0.0000000 0.5374276      0      0      0      0
## [54,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [55,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [56,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [57,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [58,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [59,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [60,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [61,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [62,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [63,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [64,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [65,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [66,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
## [67,]      0      0      0      0      0 0.0000000 0.0000000      0      0      0      0
##         [,48]      [,49] [,50] [,51] [,52]      [,53] [,54] [,55] [,56] [,57] [,58]
##  [1,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [2,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [3,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [4,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [5,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [6,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [7,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [8,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
##  [9,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [10,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [11,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [12,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [13,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [14,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [15,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [16,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [17,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [18,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [19,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [20,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
## [21,]      0 0.0000000      0      0      0 0.0000000      0      0      0      0      0
```

```
## [22,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [23,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [24,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [25,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [26,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [27,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [28,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [29,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [30,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [31,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [32,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [33,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [34,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [35,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [36,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [37,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [38,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [39,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [40,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [41,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [42,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [43,]     0 0.0000000      0      0     0 0.5374276      0      0      0      0      0
## [44,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [45,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [46,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [47,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [48,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [49,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [50,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [51,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [52,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [53,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [54,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [55,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [56,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [57,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [58,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [59,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [60,]     0 0.5002547      0      0     0 0.0000000      0      0      0      0      0
## [61,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [62,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [63,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [64,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [65,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [66,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
## [67,]     0 0.0000000      0      0     0 0.0000000      0      0      0      0      0
##            [,59]      [,60]      [,61] [,62] [,63]      [,64] [,65]      [,66] [,67]
## [1,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
## [2,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
## [3,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
## [4,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
## [5,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.5019772      0
## [6,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
## [7,] 0.0000000 0.0000000 0.0000000      0     0 0.0000000      0 0.0000000      0
```

```
##  [8,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
##  [9,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [10,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [11,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [12,] 0.5392568 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [13,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [14,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [15,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [16,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [17,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [18,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [19,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [20,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [21,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [22,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [23,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [24,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [25,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [26,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [27,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [28,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [29,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.5087680    0
## [30,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [31,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [32,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [33,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [34,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [35,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [36,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [37,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [38,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [39,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [40,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [41,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [42,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [43,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [44,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [45,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [46,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [47,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [48,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [49,] 0.0000000 0.5002547 0.0000000    0    0 0.0000000    0 0.0000000    0
## [50,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [51,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [52,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [53,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [54,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [55,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [56,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [57,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [58,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [59,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [60,] 0.0000000 0.0000000 0.0000000    0    0 0.0000000    0 0.0000000    0
## [61,] 0.0000000 0.0000000 0.0000000    0    0 0.5140417    0 0.0000000    0
```

```
## [62,] 0.0000000 0.0000000 0.0000000        0        0 0.0000000        0 0.0000000        0
## [63,] 0.0000000 0.0000000 0.0000000        0        0 0.0000000        0 0.0000000        0
## [64,] 0.0000000 0.0000000 0.5140417        0        0 0.0000000        0 0.0000000        0
## [65,] 0.0000000 0.0000000 0.0000000        0        0 0.0000000        0 0.0000000        0
## [66,] 0.0000000 0.0000000 0.0000000        0        0 0.0000000        0 0.0000000        0
## [67,] 0.0000000 0.0000000 0.0000000        0        0 0.0000000        0 0.0000000        0
```

```
vis.motif(motif.graphs,71,cl,threshold=0.2)
```

```
## Warning in vattrs[[name]][index] <- value: number of items to replace is not a
## multiple of replacement length
```
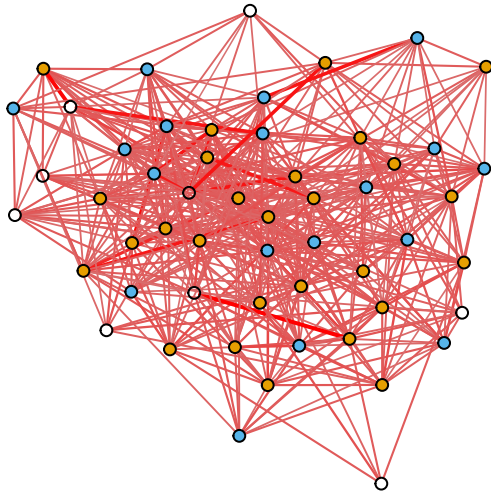


```
##              [,1]      [,2]      [,3]      [,4]      [,5]      [,6]      [,7]
##  [1,] 0.2727942 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [2,] 0.0000000 0.2929959 0.2940302 0.2359970 0.3115939 0.0000000 0.2310608
##  [3,] 0.0000000 0.2940302 0.3062719 0.2902843 0.0000000 0.2670122 0.0000000
##  [4,] 0.0000000 0.2359970 0.2902843 0.3285599 0.0000000 0.2371763 0.0000000
##  [5,] 0.0000000 0.3115939 0.0000000 0.0000000 0.2514231 0.2841794 0.0000000
##  [6,] 0.0000000 0.0000000 0.2670122 0.2371763 0.2841794 0.2846006 0.0000000
##  [7,] 0.0000000 0.2310608 0.0000000 0.0000000 0.0000000 0.0000000 0.2733311
##  [8,] 0.0000000 0.0000000 0.2308270 0.0000000 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.2538945 0.0000000 0.0000000 0.2892167 0.0000000 0.2824294
## [10,] 0.0000000 0.0000000 0.2868458 0.2414299 0.0000000 0.0000000 0.2676528
## [11,] 0.2763932 0.0000000 0.0000000 0.2596075 0.0000000 0.0000000 0.2281884
## [12,] 0.0000000 0.0000000 0.2781259 0.0000000 0.0000000 0.3168457 0.0000000
## [13,] 0.0000000 0.2229806 0.3061752 0.2535276 0.0000000 0.2509568 0.0000000
## [14,] 0.0000000 0.2780854 0.2999203 0.2433081 0.0000000 0.0000000 0.2578702
## [15,] 0.0000000 0.2930514 0.2904308 0.2665063 0.0000000 0.3011561 0.0000000
## [16,] 0.0000000 0.2551607 0.2507694 0.2732250 0.2886642 0.0000000 0.0000000
## [17,] 0.0000000 0.3248015 0.0000000 0.2379971 0.0000000 0.0000000 0.0000000
## [18,] 0.2697006 0.3162547 0.2860756 0.2643516 0.0000000 0.0000000 0.0000000
## [19,] 0.0000000 0.2678658 0.0000000 0.2649422 0.2845047 0.0000000 0.3204299
## [20,] 0.0000000 0.2620410 0.3219216 0.2428502 0.0000000 0.2800677 0.2425137
## [21,] 0.0000000 0.3053572 0.2451202 0.2529956 0.3333340 0.2475016 0.2547912
## [22,] 0.0000000 0.2815362 0.2808717 0.2527642 0.2691328 0.3103844 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.2511855 0.2681368 0.2619074 0.0000000
## [24,] 0.0000000 0.2686261 0.0000000 0.0000000 0.0000000 0.2536310 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.2780025 0.2266423 0.2389374 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2884336 0.2663537 0.0000000
```

```
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2493970 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000 0.2834126 0.0000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.2964824 0.0000000 0.0000000 0.0000000 0.0000000 0.2598993
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [31,] 0.2290739 0.2923429 0.0000000 0.0000000 0.2588657 0.0000000 0.0000000
## [32,] 0.2600871 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [33,] 0.0000000 0.2832397 0.0000000 0.2514208 0.0000000 0.0000000 0.2596428
## [34,] 0.0000000 0.0000000 0.2257290 0.3079254 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.2705699 0.2846849 0.0000000 0.0000000 0.0000000 0.2593212
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.2372887 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.2631327 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2804528
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2397072 0.2640409 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2612481 0.0000000 0.0000000
## [41,] 0.2617948 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2719995
## [42,] 0.0000000 0.2751198 0.0000000 0.0000000 0.2888660 0.0000000 0.0000000
## [43,] 0.2717584 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [44,] 0.2966454 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [45,] 0.2851948 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2325594 0.2405936 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.2756810 0.0000000 0.0000000 0.0000000 0.0000000
## [49,] 0.2444049 0.0000000 0.0000000 0.2738666 0.0000000 0.2866948 0.2617295
## [50,] 0.2918953 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [51,] 0.5172723 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [52,] 0.2842390 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [53,] 0.2785998 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.2885930 0.0000000 0.0000000 0.0000000
##             [,8]      [,9]     [,10]     [,11]     [,12]     [,13]     [,14]
##  [1,] 0.0000000 0.0000000 0.0000000 0.2763932 0.0000000 0.0000000 0.0000000
##  [2,] 0.0000000 0.2538945 0.0000000 0.0000000 0.0000000 0.2229806 0.2780854
##  [3,] 0.2308270 0.0000000 0.2868458 0.0000000 0.2781259 0.3061752 0.2999203
##  [4,] 0.0000000 0.0000000 0.2414299 0.2596075 0.0000000 0.2535276 0.2433081
##  [5,] 0.0000000 0.2892167 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.3168457 0.2509568 0.0000000
##  [7,] 0.0000000 0.2824294 0.2676528 0.2281884 0.0000000 0.0000000 0.2578702
##  [8,] 0.2897279 0.0000000 0.2331645 0.0000000 0.0000000 0.2567117 0.2414145
##  [9,] 0.0000000 0.2419749 0.2503707 0.2858309 0.0000000 0.0000000 0.2314292
## [10,] 0.2331645 0.2503707 0.2432317 0.2776884 0.2729585 0.2780904 0.2500455
## [11,] 0.0000000 0.2858309 0.2776884 0.3276161 0.2715529 0.2718736 0.2509157
## [12,] 0.0000000 0.0000000 0.2729585 0.2715529 0.2498304 0.2821352 0.0000000
## [13,] 0.2567117 0.0000000 0.2780904 0.2718736 0.2821352 0.2418320 0.2729288
## [14,] 0.2414145 0.2314292 0.2500455 0.2509157 0.0000000 0.2729288 0.2501434
## [15,] 0.0000000 0.0000000 0.2653465 0.2767592 0.2932407 0.2694531 0.2458890
## [16,] 0.0000000 0.0000000 0.0000000 0.3179466 0.3003484 0.0000000 0.2935473
## [17,] 0.0000000 0.3176427 0.0000000 0.2771120 0.0000000 0.0000000 0.2723913
## [18,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2909348 0.2813642 0.2616550
## [19,] 0.0000000 0.2689426 0.0000000 0.2523122 0.0000000 0.0000000 0.0000000
## [20,] 0.2727464 0.2875717 0.2551647 0.2265175 0.0000000 0.2583573 0.2886717
## [21,] 0.2309449 0.2850071 0.2928435 0.3308459 0.2635977 0.2748485 0.2693322
## [22,] 0.2387801 0.2649107 0.0000000 0.2488498 0.2708197 0.2314558 0.0000000
## [23,] 0.0000000 0.0000000 0.2364147 0.2903196 0.3189315 0.2598960 0.2471635
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2715765
## [25,] 0.0000000 0.0000000 0.0000000 0.2930772 0.3062740 0.0000000 0.0000000
```

```
## [26,] 0.0000000 0.0000000 0.2588566 0.0000000 0.2235378 0.2623001 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.2463625 0.0000000 0.0000000 0.0000000
## [28,] 0.2682859 0.0000000 0.2488816 0.2765076 0.2619435 0.2636643 0.2697018
## [29,] 0.0000000 0.0000000 0.0000000 0.3126530 0.2583780 0.0000000 0.0000000
## [30,] 0.0000000 0.0000000 0.2768512 0.3095671 0.0000000 0.3083497 0.0000000
## [31,] 0.0000000 0.2490463 0.0000000 0.3222824 0.0000000 0.0000000 0.2572428
## [32,] 0.0000000 0.2697161 0.0000000 0.2714449 0.0000000 0.0000000 0.2846896
## [33,] 0.0000000 0.2653965 0.0000000 0.2950480 0.0000000 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.2842993 0.2967985 0.0000000 0.2380260 0.2564377
## [35,] 0.0000000 0.2684541 0.0000000 0.2816236 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2781583 0.0000000 0.0000000
## [37,] 0.2762564 0.0000000 0.2536639 0.2289969 0.0000000 0.2998214 0.2563898
## [38,] 0.0000000 0.2345753 0.0000000 0.2294319 0.0000000 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000 0.2756050 0.0000000 0.0000000 0.2719816 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.2780822 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.0000000 0.2755319 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.2615873 0.0000000 0.4202537 0.0000000 0.0000000 0.0000000
## [43,] 0.2408387 0.0000000 0.0000000 0.2172437 0.0000000 0.2713111 0.0000000
## [44,] 0.0000000 0.5127517 0.0000000 0.2379614 0.0000000 0.0000000 0.0000000
## [45,] 0.0000000 0.0000000 0.0000000 0.2785166 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.2586527 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.2834598 0.0000000 0.2606090 0.0000000 0.0000000
## [48,] 0.2769596 0.0000000 0.0000000 0.2535016 0.0000000 0.2697998 0.0000000
## [49,] 0.0000000 0.2901938 0.0000000 0.2963600 0.0000000 0.0000000 0.0000000
## [50,] 0.0000000 0.0000000 0.2699155 0.2800078 0.0000000 0.0000000 0.0000000
## [51,] 0.0000000 0.0000000 0.0000000 0.3451510 0.0000000 0.0000000 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.2732410 0.0000000 0.0000000 0.0000000
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##            [,15]     [,16]     [,17]     [,18]     [,19]     [,20]     [,21]
##  [1,] 0.0000000 0.0000000 0.0000000 0.2697006 0.0000000 0.0000000 0.0000000
##  [2,] 0.2930514 0.2551607 0.3248015 0.3162547 0.2678658 0.2620410 0.3053572
##  [3,] 0.2904308 0.2507694 0.0000000 0.2860756 0.0000000 0.3219216 0.2451202
##  [4,] 0.2665063 0.2732250 0.2379971 0.2643516 0.2649422 0.2428502 0.2529956
##  [5,] 0.0000000 0.2886642 0.0000000 0.0000000 0.2845047 0.0000000 0.3333340
##  [6,] 0.3011561 0.0000000 0.0000000 0.0000000 0.0000000 0.2800677 0.2475016
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.3204299 0.2425137 0.2547912
##  [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2727464 0.2309449
##  [9,] 0.0000000 0.0000000 0.3176427 0.0000000 0.2689426 0.2875717 0.2850071
## [10,] 0.2653465 0.0000000 0.0000000 0.0000000 0.0000000 0.2551647 0.2928435
## [11,] 0.2767592 0.3179466 0.2771120 0.0000000 0.2523122 0.2265175 0.3308459
## [12,] 0.2932407 0.3003484 0.0000000 0.2909348 0.0000000 0.0000000 0.2635977
## [13,] 0.2694531 0.0000000 0.0000000 0.2813642 0.0000000 0.2583573 0.2748485
## [14,] 0.2458890 0.2935473 0.2723913 0.2616550 0.0000000 0.2886717 0.2693322
## [15,] 0.3448344 0.2596496 0.2636545 0.2966582 0.0000000 0.2310198 0.2432450
## [16,] 0.2596496 0.2992473 0.2626838 0.2397104 0.2764964 0.2870855 0.2649098
## [17,] 0.2636545 0.2626838 0.2567433 0.0000000 0.0000000 0.2690980 0.2962291
## [18,] 0.2966582 0.2397104 0.0000000 0.2972235 0.0000000 0.0000000 0.2872478
## [19,] 0.0000000 0.2764964 0.0000000 0.0000000 0.2405733 0.0000000 0.0000000
## [20,] 0.2310198 0.2870855 0.2690980 0.0000000 0.0000000 0.2477167 0.3030622
## [21,] 0.2432450 0.2649098 0.2962291 0.2872478 0.0000000 0.3030622 0.2870809
## [22,] 0.0000000 0.2361543 0.2371096 0.0000000 0.3249891 0.2722960 0.2513342
## [23,] 0.2977462 0.0000000 0.0000000 0.2902207 0.0000000 0.2865540 0.2822933
## [24,] 0.2687811 0.2662469 0.0000000 0.3401161 0.0000000 0.2872849 0.2376781
```

```
## [25,] 0.0000000 0.2490404 0.2728011 0.2572360 0.0000000 0.2836397 0.2729772
## [26,] 0.3212359 0.0000000 0.0000000 0.2733089 0.0000000 0.0000000 0.2845713
## [27,] 0.0000000 0.0000000 0.2408844 0.2808797 0.2532020 0.2567138 0.2444465
## [28,] 0.2444068 0.0000000 0.0000000 0.2751488 0.0000000 0.0000000 0.2535541
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2536327 0.2400006
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2881168 0.2444499
## [31,] 0.0000000 0.0000000 0.0000000 0.3011491 0.0000000 0.0000000 0.2858648
## [32,] 0.0000000 0.2820649 0.3220496 0.0000000 0.0000000 0.2592557 0.2703158
## [33,] 0.0000000 0.0000000 0.2881420 0.3046169 0.2777614 0.2865149 0.2752347
## [34,] 0.2836493 0.2623414 0.0000000 0.0000000 0.0000000 0.2800061 0.2668402
## [35,] 0.2621929 0.2425106 0.3065210 0.0000000 0.0000000 0.2161845 0.2693655
## [36,] 0.0000000 0.0000000 0.0000000 0.2550646 0.2813526 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2521357 0.0000000
## [38,] 0.0000000 0.0000000 0.2891140 0.3027676 0.0000000 0.0000000 0.2667370
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.2498620 0.0000000 0.0000000 0.0000000
## [41,] 0.0000000 0.0000000 0.2193907 0.0000000 0.2946490 0.3079538 0.2725395
## [42,] 0.0000000 0.0000000 0.0000000 0.2973841 0.0000000 0.0000000 0.4713217
## [43,] 0.0000000 0.2802761 0.2807106 0.2915648 0.2196399 0.2730837 0.2812048
## [44,] 0.0000000 0.2469848 0.2483147 0.3024883 0.2697182 0.2422631 0.2928984
## [45,] 0.0000000 0.0000000 0.3126725 0.0000000 0.0000000 0.2689707 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2396201
## [48,] 0.3173082 0.0000000 0.0000000 0.2501726 0.0000000 0.2659968 0.0000000
## [49,] 0.0000000 0.0000000 0.0000000 0.3020837 0.0000000 0.4806145 0.2737182
## [50,] 0.0000000 0.0000000 0.2679772 0.2859029 0.2720901 0.3099036 0.2893078
## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2950438 0.0000000
## [52,] 0.0000000 0.2916809 0.2384648 0.2911390 0.0000000 0.0000000 0.2449108
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2786048
## [54,] 0.2778121 0.0000000 0.2565254 0.0000000 0.0000000 0.0000000 0.0000000
##            [,22]      [,23]      [,24]      [,25]      [,26]      [,27]      [,28]
##  [1,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [2,] 0.2815362 0.0000000 0.2686261 0.0000000 0.0000000 0.0000000 0.0000000
##  [3,] 0.2808717 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2834126
##  [4,] 0.2527642 0.2511855 0.0000000 0.2780025 0.0000000 0.0000000 0.0000000
##  [5,] 0.2691328 0.2681368 0.0000000 0.2266423 0.2884336 0.2493970 0.0000000
##  [6,] 0.3103844 0.2619074 0.2536310 0.2389374 0.2663537 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [8,] 0.2387801 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2682859
##  [9,] 0.2649107 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [10,] 0.0000000 0.2364147 0.0000000 0.0000000 0.2588566 0.0000000 0.2488816
## [11,] 0.2488498 0.2903196 0.0000000 0.2930772 0.0000000 0.2463625 0.2765076
## [12,] 0.2708197 0.3189315 0.0000000 0.3062740 0.2235378 0.0000000 0.2619435
## [13,] 0.2314558 0.2598960 0.0000000 0.0000000 0.2623001 0.0000000 0.2636643
## [14,] 0.0000000 0.2471635 0.2715765 0.0000000 0.0000000 0.0000000 0.2697018
## [15,] 0.0000000 0.2977462 0.2687811 0.0000000 0.3212359 0.0000000 0.2444068
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## [19,] 0.3249891 0.0000000 0.0000000 0.0000000 0.0000000 0.2532020 0.0000000
## [20,] 0.2722960 0.2865540 0.2872849 0.2836397 0.0000000 0.2567138 0.0000000
## [21,] 0.2513342 0.2822933 0.2376781 0.2729772 0.2845713 0.2444465 0.2535541
## [22,] 0.3149614 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2432400
## [23,] 0.0000000 0.2685883 0.3093128 0.2852858 0.2842447 0.0000000 0.2186825
```

```
## [24,] 0.0000000 0.3093128 0.2505780 0.2622403 0.2636093 0.3059172 0.0000000
## [25,] 0.0000000 0.2852858 0.2622403 0.3176233 0.3200047 0.3375757 0.0000000
## [26,] 0.0000000 0.2842447 0.2636093 0.3200047 0.3199723 0.2682133 0.0000000
## [27,] 0.0000000 0.0000000 0.3059172 0.3375757 0.2682133 0.2954807 0.2947574
## [28,] 0.2432400 0.2186825 0.0000000 0.0000000 0.0000000 0.2947574 0.2786408
## [29,] 0.0000000 0.0000000 0.2433994 0.0000000 0.0000000 0.0000000 0.2903275
## [30,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2577516 0.0000000
## [31,] 0.0000000 0.0000000 0.2835923 0.0000000 0.0000000 0.0000000 0.0000000
## [32,] 0.2724791 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [33,] 0.2628707 0.0000000 0.0000000 0.2841951 0.0000000 0.2793958 0.0000000
## [34,] 0.2595108 0.2180248 0.2428231 0.0000000 0.0000000 0.0000000 0.2742123
## [35,] 0.2987537 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.2792742 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2350174
## [38,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [39,] 0.0000000 0.3019367 0.2952429 0.2558707 0.2747528 0.0000000 0.0000000
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## [41,] 0.0000000 0.0000000 0.0000000 0.2801818 0.0000000 0.0000000 0.0000000
## [42,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2659812 0.0000000
## [43,] 0.4654570 0.0000000 0.0000000 0.2575015 0.0000000 0.0000000 0.0000000
## [44,] 0.2821580 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2812990
## [45,] 0.2790076 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.2899864 0.2749055 0.2973556 0.2753157 0.2747746 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2543082
## [49,] 0.2749795 0.0000000 0.2204416 0.0000000 0.0000000 0.0000000 0.0000000
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## [51,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
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## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [54,] 0.0000000 0.3017595 0.0000000 0.0000000 0.2656326 0.0000000 0.0000000
##              [,29]     [,30]     [,31]     [,32]     [,33]     [,34]     [,35]
##   [1,] 0.0000000 0.0000000 0.2290739 0.2600871 0.0000000 0.0000000 0.0000000
##   [2,] 0.2964824 0.0000000 0.2923429 0.0000000 0.2832397 0.0000000 0.2705699
##   [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2257290 0.2846849
##   [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2514208 0.3079254 0.0000000
##   [5,] 0.0000000 0.0000000 0.2588657 0.0000000 0.0000000 0.0000000 0.0000000
##   [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##   [7,] 0.2598993 0.0000000 0.0000000 0.0000000 0.2596428 0.0000000 0.2593212
##   [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##   [9,] 0.0000000 0.0000000 0.2490463 0.2697161 0.2653965 0.0000000 0.2684541
## [10,] 0.0000000 0.2768512 0.0000000 0.0000000 0.0000000 0.2842993 0.0000000
## [11,] 0.3126530 0.3095671 0.3222824 0.2714449 0.2950480 0.2967985 0.2816236
## [12,] 0.2583780 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.3083497 0.0000000 0.0000000 0.0000000 0.2380260 0.0000000
## [14,] 0.0000000 0.0000000 0.2572428 0.2846896 0.0000000 0.2564377 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2836493 0.2621929
## [16,] 0.0000000 0.0000000 0.0000000 0.2820649 0.0000000 0.2623414 0.2425106
## [17,] 0.0000000 0.0000000 0.0000000 0.3220496 0.2881420 0.0000000 0.3065210
## [18,] 0.0000000 0.0000000 0.3011491 0.0000000 0.3046169 0.0000000 0.0000000
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## [22,] 0.0000000 0.0000000 0.0000000 0.2724791 0.2628707 0.2595108 0.2987537
```

```
## [23,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2180248 0.0000000
## [24,] 0.2433994 0.0000000 0.2835923 0.0000000 0.0000000 0.2428231 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2841951 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.2577516 0.0000000 0.0000000 0.2793958 0.0000000 0.0000000
## [28,] 0.2903275 0.0000000 0.0000000 0.0000000 0.0000000 0.2742123 0.0000000
## [29,] 0.2025961 0.2465430 0.0000000 0.0000000 0.2710970 0.0000000 0.2951424
## [30,] 0.2465430 0.2378574 0.0000000 0.2639666 0.2425004 0.2694784 0.0000000
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## [33,] 0.2710970 0.2425004 0.2947790 0.2709953 0.2627359 0.3091951 0.2550984
## [34,] 0.0000000 0.2694784 0.2923426 0.2822212 0.3091951 0.2125894 0.0000000
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## [36,] 0.3078153 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.4758774 0.2660090 0.0000000 0.0000000 0.2356514 0.2390901
## [38,] 0.0000000 0.0000000 0.0000000 0.2857389 0.2486489 0.0000000 0.0000000
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2722985 0.2849007 0.0000000
## [40,] 0.0000000 0.2562148 0.2268721 0.2391536 0.3272553 0.0000000 0.2543385
## [41,] 0.2334614 0.2739689 0.2663501 0.2620682 0.2379100 0.2897565 0.0000000
## [42,] 0.2440591 0.0000000 0.0000000 0.2550332 0.2699743 0.0000000 0.0000000
## [43,] 0.2709876 0.2713046 0.3058427 0.2507519 0.2444418 0.0000000 0.2970957
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## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
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## [50,] 0.0000000 0.0000000 0.4749111 0.2464078 0.3002079 0.0000000 0.0000000
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## [52,] 0.0000000 0.0000000 0.0000000 0.2561422 0.3033843 0.0000000 0.0000000
## [53,] 0.0000000 0.0000000 0.2846988 0.0000000 0.0000000 0.0000000 0.0000000
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##             [,36]     [,37]     [,38]     [,39]     [,40]     [,41]     [,42]
##  [1,] 0.0000000 0.0000000 0.2631327 0.0000000 0.0000000 0.2617948 0.0000000
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##  [3,] 0.0000000 0.2372887 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [5,] 0.0000000 0.0000000 0.0000000 0.2397072 0.2612481 0.0000000 0.2888660
##  [6,] 0.0000000 0.0000000 0.0000000 0.2640409 0.0000000 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000 0.2804528 0.0000000 0.0000000 0.2719995 0.0000000
##  [8,] 0.0000000 0.2762564 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000 0.2345753 0.0000000 0.0000000 0.0000000 0.2615873
## [10,] 0.0000000 0.2536639 0.0000000 0.2756050 0.0000000 0.0000000 0.0000000
## [11,] 0.0000000 0.2289969 0.2294319 0.0000000 0.2780822 0.2755319 0.4202537
## [12,] 0.2781583 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.2998214 0.0000000 0.2719816 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.2563898 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [16,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [17,] 0.0000000 0.0000000 0.2891140 0.0000000 0.0000000 0.2193907 0.0000000
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## [19,] 0.2813526 0.0000000 0.0000000 0.0000000 0.0000000 0.2946490 0.0000000
## [20,] 0.0000000 0.2521357 0.0000000 0.0000000 0.0000000 0.3079538 0.0000000
## [21,] 0.0000000 0.0000000 0.2667370 0.0000000 0.0000000 0.2725395 0.4713217
```

```
## [22,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [23,] 0.0000000 0.0000000 0.0000000 0.3019367 0.0000000 0.0000000 0.0000000
## [24,] 0.2792742 0.0000000 0.0000000 0.2952429 0.5341605 0.0000000 0.0000000
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## [26,] 0.0000000 0.0000000 0.0000000 0.2747528 0.2997911 0.0000000 0.0000000
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## [31,] 0.0000000 0.2660090 0.0000000 0.0000000 0.2268721 0.2663501 0.0000000
## [32,] 0.0000000 0.0000000 0.2857389 0.0000000 0.2391536 0.2620682 0.2550332
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## [37,] 0.0000000 0.2947310 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.0000000 0.0000000 0.2483949 0.0000000 0.2829137 0.3003585 0.0000000
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## [47,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [48,] 0.0000000 0.2500576 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [49,] 0.0000000 0.0000000 0.2828667 0.0000000 0.0000000 0.2272447 0.2459713
## [50,] 0.0000000 0.0000000 0.2435046 0.2464494 0.0000000 0.2999738 0.2466795
## [51,] 0.0000000 0.0000000 0.2426711 0.0000000 0.0000000 0.2365202 0.2446381
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2458181
## [53,] 0.0000000 0.0000000 0.2815824 0.0000000 0.0000000 0.0000000 0.2894833
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##            [,43]     [,44]     [,45]     [,46]     [,47]     [,48]     [,49]
##   [1,] 0.2717584 0.2966454 0.2851948 0.0000000 0.0000000 0.0000000 0.2444049
##   [2,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##   [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2756810 0.0000000
##   [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2738666
##   [5,] 0.0000000 0.0000000 0.0000000 0.2325594 0.0000000 0.0000000 0.0000000
##   [6,] 0.0000000 0.0000000 0.0000000 0.2405936 0.0000000 0.0000000 0.2866948
##   [7,] 0.0000000 0.0000000 0.0000000 0.2405936 0.0000000 0.0000000 0.2617295
##   [8,] 0.2408387 0.0000000 0.0000000 0.0000000 0.0000000 0.2769596 0.0000000
##   [9,] 0.0000000 0.5127517 0.0000000 0.0000000 0.0000000 0.0000000 0.2901938
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2834598 0.0000000 0.0000000
## [11,] 0.2172437 0.2379614 0.2785166 0.2586527 0.0000000 0.2535016 0.2963600
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2606090 0.0000000 0.0000000
## [13,] 0.2713111 0.0000000 0.0000000 0.0000000 0.0000000 0.2697998 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.3173082 0.0000000
## [16,] 0.2802761 0.2469848 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [17,] 0.2807106 0.2483147 0.3126725 0.0000000 0.0000000 0.0000000 0.0000000
## [18,] 0.2915648 0.3024883 0.0000000 0.0000000 0.0000000 0.2501726 0.3020837
## [19,] 0.2196399 0.2697182 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [20,] 0.2730837 0.2422631 0.2689707 0.0000000 0.0000000 0.2659968 0.4806145
```

```
## [21,] 0.2812048 0.2928984 0.0000000 0.0000000 0.2396201 0.0000000 0.2737182
## [22,] 0.4654570 0.2821580 0.2790076 0.0000000 0.0000000 0.0000000 0.2749795
## [23,] 0.0000000 0.0000000 0.0000000 0.2899864 0.0000000 0.0000000 0.0000000
## [24,] 0.0000000 0.0000000 0.0000000 0.2749055 0.0000000 0.0000000 0.2204416
## [25,] 0.2575015 0.0000000 0.0000000 0.2973556 0.0000000 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.2753157 0.0000000 0.0000000 0.0000000
## [27,] 0.0000000 0.0000000 0.0000000 0.2747746 0.0000000 0.0000000 0.0000000
## [28,] 0.0000000 0.2812990 0.0000000 0.0000000 0.0000000 0.2543082 0.0000000
## [29,] 0.2709876 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2516631
## [30,] 0.2713046 0.2723324 0.2448459 0.0000000 0.0000000 0.0000000 0.2894443
## [31,] 0.3058427 0.2843532 0.2659988 0.0000000 0.0000000 0.0000000 0.4711804
## [32,] 0.2507519 0.3244484 0.2343823 0.0000000 0.0000000 0.0000000 0.2604830
## [33,] 0.2444418 0.2688493 0.2537622 0.0000000 0.0000000 0.0000000 0.2801802
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [35,] 0.2970957 0.0000000 0.2741421 0.0000000 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2500576 0.0000000
## [38,] 0.2988757 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2828667
## [39,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [40,] 0.0000000 0.3116738 0.2466440 0.2840201 0.0000000 0.0000000 0.0000000
## [41,] 0.2453635 0.2489935 0.2580259 0.0000000 0.0000000 0.0000000 0.2272447
## [42,] 0.2594873 0.2735793 0.0000000 0.2516939 0.0000000 0.0000000 0.2459713
## [43,] 0.2571194 0.2718033 0.2827480 0.0000000 0.0000000 0.0000000 0.2579508
## [44,] 0.2718033 0.2395361 0.2738135 0.0000000 0.2492086 0.2822983 0.3170337
## [45,] 0.2827480 0.2738135 0.2762778 0.0000000 0.2720076 0.0000000 0.2805374
## [46,] 0.0000000 0.0000000 0.0000000 0.3053590 0.0000000 0.0000000 0.2857754
## [47,] 0.0000000 0.2492086 0.2720076 0.0000000 0.6789209 0.2665814 0.2559346
## [48,] 0.0000000 0.2822983 0.0000000 0.0000000 0.2665814 0.2778976 0.4773986
## [49,] 0.2579508 0.3170337 0.2805374 0.2857754 0.2559346 0.4773986 0.2755538
## [50,] 0.2595335 0.3086691 0.2850858 0.0000000 0.2104410 0.2706938 0.4616169
## [51,] 0.2879015 0.2425835 0.2596604 0.0000000 0.0000000 0.0000000 0.0000000
## [52,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.2368557
## [53,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2719853 0.2675616 0.2692430
## [54,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##            [,50]     [,51]     [,52]     [,53]     [,54]
##  [1,] 0.2918953 0.5172723 0.2842390 0.2785998 0.0000000
##  [2,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2885930
##  [5,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##  [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [10,] 0.2699155 0.0000000 0.0000000 0.0000000 0.0000000
## [11,] 0.2800078 0.3451510 0.2732410 0.0000000 0.0000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [15,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2778121
## [16,] 0.0000000 0.0000000 0.2916809 0.0000000 0.0000000
## [17,] 0.2679772 0.0000000 0.2384648 0.0000000 0.2565254
## [18,] 0.2859029 0.0000000 0.2911390 0.0000000 0.0000000
## [19,] 0.2720901 0.0000000 0.0000000 0.0000000 0.0000000
```

```
## [20,] 0.3099036 0.2950438 0.0000000 0.0000000 0.0000000
## [21,] 0.2893078 0.0000000 0.2449108 0.2786048 0.0000000
## [22,] 0.0000000 0.0000000 0.2637964 0.0000000 0.0000000
## [23,] 0.2894952 0.0000000 0.0000000 0.0000000 0.3017595
## [24,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [25,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [26,] 0.0000000 0.0000000 0.0000000 0.0000000 0.2656326
## [27,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [28,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [29,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [30,] 0.0000000 0.2410022 0.0000000 0.0000000 0.0000000
## [31,] 0.4749111 0.2621258 0.0000000 0.2846988 0.0000000
## [32,] 0.2464078 0.2715413 0.2561422 0.0000000 0.2924328
## [33,] 0.3002079 0.0000000 0.3033843 0.0000000 0.0000000
## [34,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [35,] 0.0000000 0.4739264 0.0000000 0.0000000 0.0000000
## [36,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [37,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [38,] 0.2435046 0.2426711 0.0000000 0.2815824 0.0000000
## [39,] 0.2464494 0.0000000 0.0000000 0.0000000 0.0000000
## [40,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [41,] 0.2999738 0.2365202 0.0000000 0.0000000 0.0000000
## [42,] 0.2466795 0.2446381 0.2458181 0.2894833 0.0000000
## [43,] 0.2595335 0.2879015 0.0000000 0.0000000 0.0000000
## [44,] 0.3086691 0.2425835 0.0000000 0.0000000 0.0000000
## [45,] 0.2850858 0.2596604 0.0000000 0.0000000 0.0000000
## [46,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [47,] 0.2104410 0.0000000 0.0000000 0.2719853 0.0000000
## [48,] 0.2706938 0.0000000 0.0000000 0.2675616 0.0000000
## [49,] 0.4616169 0.0000000 0.2368557 0.2692430 0.0000000
## [50,] 0.3347241 0.2627641 0.3099056 0.2603242 0.2996033
## [51,] 0.2627641 0.2478623 0.2712008 0.2686424 0.2383378
## [52,] 0.3099056 0.2712008 0.3243540 0.2625186 0.0000000
## [53,] 0.2603242 0.2686424 0.2625186 0.2883047 0.2429939
## [54,] 0.2996033 0.2383378 0.0000000 0.2429939 0.2622221
```

Matching graph embeddings to multivariate normal distribution

```
parameters.3<-update.parameters(parameters,list(ae_type="ARGVA",
                                                  lambda_kl=1e-2))
embedding.model<-cluster.model.fit(parameters.3, net.list)
z<-extract.embeddings(embedding.model)
cl<-extract.clusters(embedding.model)
lo<-make.layout(z)
G.true<-extract.graphs(embedding.model)$A.true
plot.net(G.true,cl,layout=lo)
```
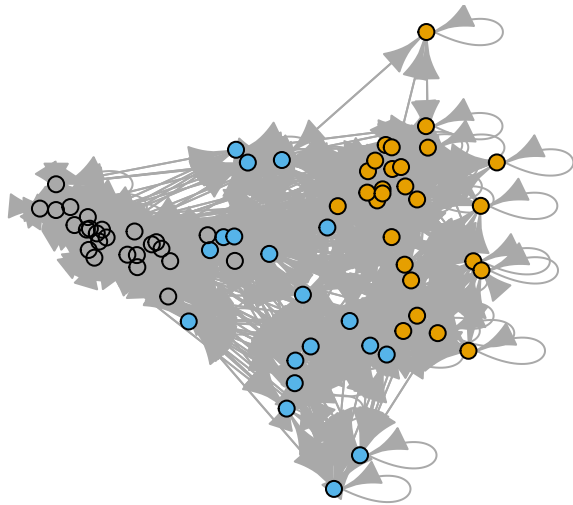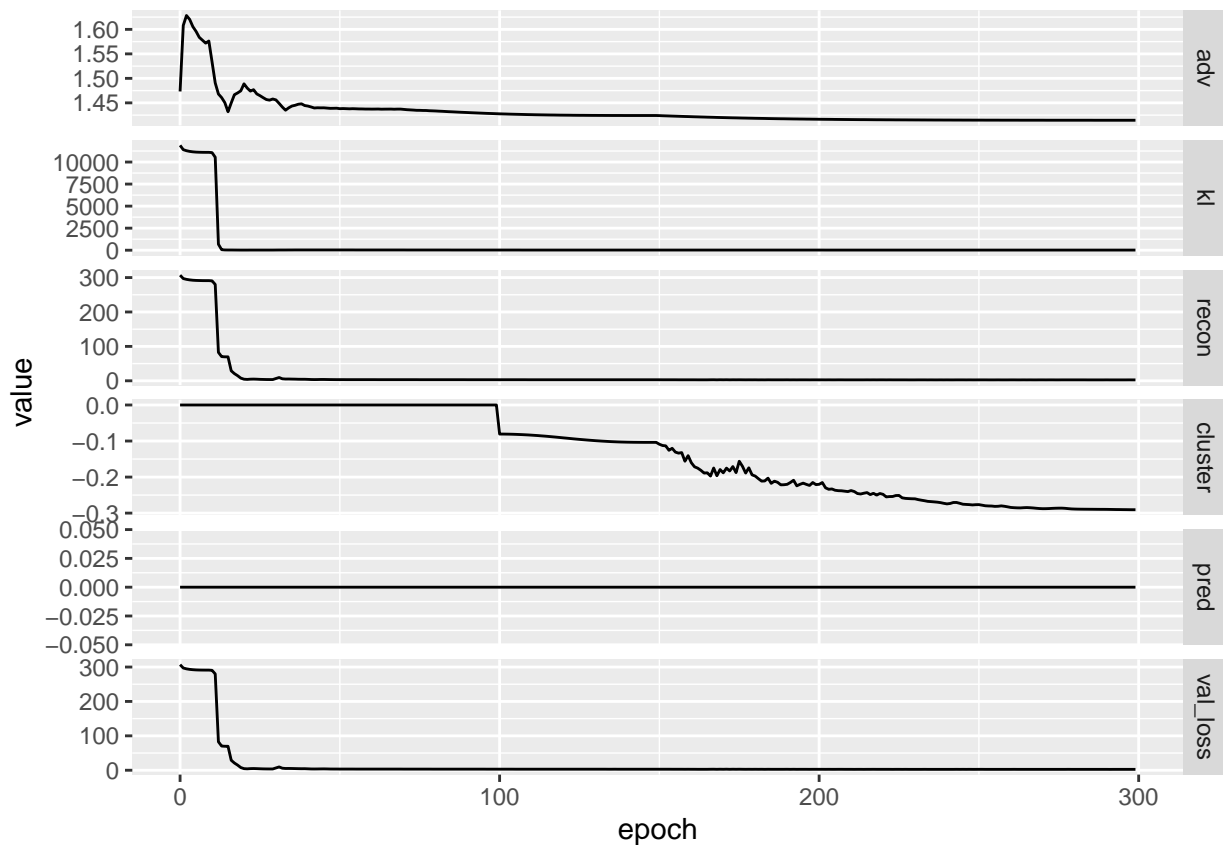
Plot diagnostics with added variational KL divergence loss

```r
plot.diagnostics(embedding.model)
```

```
## Warning in melt(loss.log, id.vars = "epoch"): The melt generic in data.table
## has been passed a data.frame and will attempt to redirect to the relevant
## reshape2 method; please note that reshape2 is deprecated, and this redirection
## is now deprecated as well. To continue using melt methods from reshape2 while
## both libraries are attached, e.g. melt.list, you can prepend the namespace
## like reshape2::melt(loss.log). In the next version, this warning will become an
## error.

## Warning in melt(loss.log, id.vars = "epoch"): The melt generic in data.table
## has been passed a data.frame and will attempt to redirect to the relevant
## reshape2 method; please note that reshape2 is deprecated, and this redirection
## is now deprecated as well. To continue using melt methods from reshape2 while
## both libraries are attached, e.g. melt.list, you can prepend the namespace
## like reshape2::melt(loss.log). In the next version, this warning will become an
## error.
```

Simulate Networks from Variational Graph Auto-Encoder model

```r
sim.graphs<-simulate.networks(embedding.model,nsim=30)
cl<-extract.clusters(embedding.model)
for (i in c(1,2,29,30)){
  net<-sim.graphs$networks[[i]]
  embedding<-sim.graphs$embeddings[[i]]
  lo<-make.layout(embedding)
  plot.net(net,cl,layout = lo)
}
```