Subgroups Chapter 4

Nick Lauerman

Contents

Libraries and data used

Libraries

```
library(UserNetR)
library(igraph)
```

```
##
## Attaching package: 'igraph'

## The following objects are masked from 'package:stats':
##
##     decompose, spectrum

## The following object is masked from 'package:base':
##
##     union
```
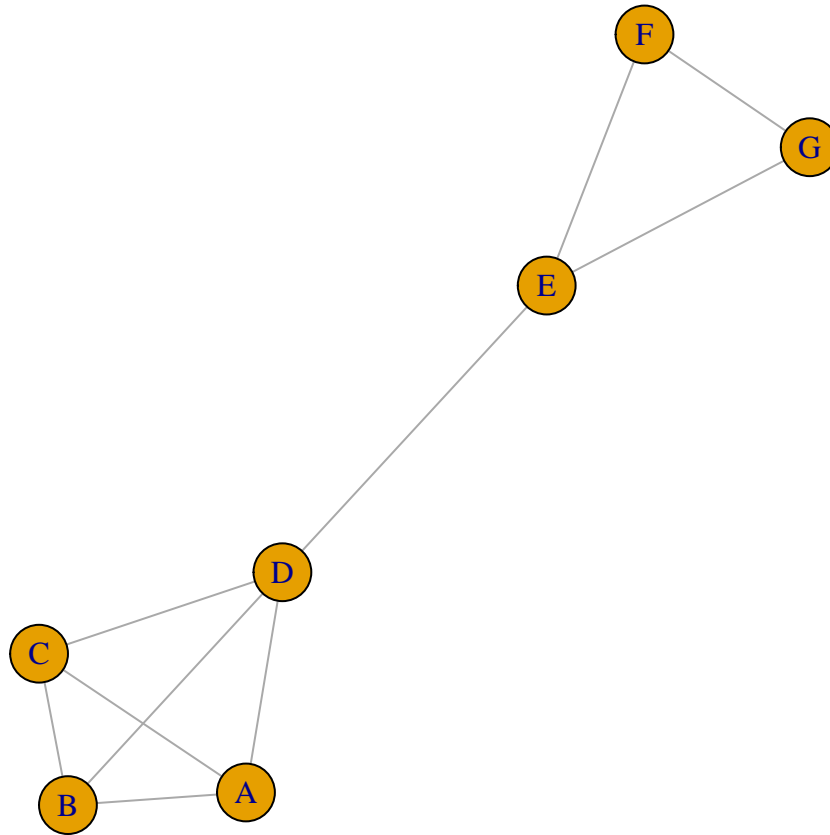
Data

Social Cohesion

Cliques

```
clqexmp <- graph.formula(A:B:C:D--A:B:C:D,D-E,E-F-G-E)
plot(clqexmp,
     layout = layout_with_fr)
```

```
clique.number(clqexmp)
```

```
## [1] 4
```

```
cliques(clqexmp,
        min = 3)
```

```
## [[1]]
## + 3/7 vertices, named, from 2003fde:
## [1] B C D
##
## [[2]]
## + 3/7 vertices, named, from 2003fde:
## [1] E F G
##
```

```
## [[3]]
## + 3/7 vertices, named, from 2003fde:
## [1] A B C
##
## [[4]]
## + 4/7 vertices, named, from 2003fde:
## [1] A B C D
##
## [[5]]
## + 3/7 vertices, named, from 2003fde:
## [1] A B D
##
## [[6]]
## + 3/7 vertices, named, from 2003fde:
## [1] A C D
```

```r
maximal.cliques(clqexmp,
                min = 3)
```

```
## [[1]]
## + 3/7 vertices, named, from 2003fde:
## [1] E F G
##
## [[2]]
## + 4/7 vertices, named, from 2003fde:
## [1] A B D C
```

```r
largest.cliques(clqexmp)
```

```
## [[1]]
## + 4/7 vertices, named, from 2003fde:
## [1] D A B C
```

```r
V(clqexmp)[unlist(largest.cliques(clqexmp))]
```

```
## + 4/7 vertices, named, from 2003fde:
## [1] D A B C
```

```r
g25 <- erdos.renyi.game(25,
                        75,
                        type = "gnm")
g50 <- erdos.renyi.game(50,
                        150,
                        type = "gnm")
g100 <- erdos.renyi.game(100,
                         300,
                         type = "gnm")
g500 <- erdos.renyi.game(500,
                         1500,
                         type = "gnm")
g1000 <- erdos.renyi.game(1000,
                          3000,
                          type = "gnm")
g5000 <- erdos.renyi.game(5000,
                          15000,
                          type = "gnm")
g10000 <- erdos.renyi.game(10000,
```

```r
                              30000,
                              type = "gnm")
nodes <- c(25,
           50,
           100,
           500,
           1000,
           5000,
           10000)
lrgclg <- c(clique.number(g25),
            clique.number(g50),
            clique.number(g100),
            clique.number(g500),
            clique.number(g1000),
            clique.number(g5000),
            clique.number(g10000))
numclq <- c(length(cliques(g25,
                           min = 3)),
            length(cliques(g50,
                           min = 3)),
            length(cliques(g100,
                           min = 3)),
            length(cliques(g500,
                           min = 3)),
            length(cliques(g1000,
                           min = 3)),
            length(cliques(g5000,
                           min = 3)),
            length(cliques(g10000,
                           min = 3)))
clqinfo <- data.frame(
  Nodes = nodes,
  Largest = lrgclg,
  number = numclq)
clqinfo
```

```
##    Nodes Largest number
## 1     25       4     37
## 2     50       4     32
## 3    100       3     36
## 4    500       3     34
## 5   1000       3     37
## 6   5000       3     44
## 7  10000       3     41
```