How can I manage and plot social network data in R?

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Managing and plotting social network data in R can be achieved through various methods. Firstly, it is essential to import the data into R using packages such as igraph or statnet. These packages allow for the creation of network objects that can be manipulated and analyzed.

Next, it is crucial to understand the structure of the data and the type of network it represents (e.g., directed, undirected, weighted). This information will help in choosing the appropriate visualization techniques and analysis methods.

To plot the social network data, R offers various visualization packages such as ggplot2, igraph, and networkD3. These packages allow for the creation of visually appealing and informative network plots. It is recommended to experiment with different layouts, colors, and node sizes to effectively communicate the network's underlying structure.

Furthermore, R also offers various tools for managing and analyzing social network data, such as calculating centrality measures, identifying communities, and conducting statistical tests. These tools can aid in gaining insights into the network and its dynamics.

In summary, managing and plotting social network data in R requires importing the data, understanding its structure, and utilizing appropriate visualization and analysis techniques. With the help of R's versatile packages and tools, one can effectively manage and analyze social network data for various research purposes.

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How can I manage and plot social network data? | R FAQ

This page uses the following package. Make sure that you can load them before trying to run the examples on this page. If you do not have a package installed, run: `install.packages("packagename")`, or if you see the version is out of date, run: `update.packages()`.

```
Version info: Code for this page was tested in R version 3.0.1 (2013-05-16)
On: 2013-10-15
With: knitr 1.5; igraph 0.6.5-2
```

Plotting social network data can be easily done with the igraph package in R.
This page will demonstrate some basic data management steps for social network
data and provide the commands for creating a social network plot.

First, load the package igraph assuming it's installed already:

```
require(igraph)
```

We will start with an adjacency table, mat25.txt.

```
x<-
read.table("https://stats.idre.ucla.edu/stat/data/mat25.txt
",header=FALSE)head(x)
```

```
## V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12 V13 V14
V15 V16 V17 V18 V19 V20
## 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0
## 2 0 0 0 0 1 1 0 0 0 1 0 0 0 0 0 0 0 0 1
## 3 0 1 0 0 1 0 1 1 0 0 0 0 0 0 0 0 1 0 0
## 4 0 0 0 0 0 1 0 0 0 0 0 1 1 0 0 0 0 1 0 0
## 5 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 1
```

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```
## 6 0 0 0 0 0 0 0 1 0 0 0 1 0 1 0 1 0 0 0 0
## V21 V22 V23 V24 V25
## 1 0 1 0 1 0
## 2 1 0 0 0 0
## 3 0 0 0 0 0
## 4 0 0 0 1 0
## 5 1 0 0 0 1
## 6 1 0 0 0 0
```

In order for the `igraph` package to recognize this table as a network, we can
first convert it to a matrix. Then, if we wish to calculate graph-related
statistics on it (betweenness, closeness, degree), we can use the matrix to
create a graph object.

```
network<-as.matrix(x)g1<-graph.adjacency(network)# compute betweenness(b1<-betweenness(g1,directed=FALSE))
```

```
## V1 V2 V3 V4 V5 V6 V7 V8 V9 V10
## 12.510 4.109 10.409 4.920 11.346 12.489 1.835 14.577 6.052 6.901
```

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```
## V11 V12 V13 V14 V15 V16 V17 V18 V19 V20
## 4.176 10.283 7.496 9.331 2.147 4.066 1.069 4.217 4.420
9.077
## V21 V22 V23 V24 V25
## 10.155 9.407 4.019 12.067 9.920

# compute closeness(c1<-closeness(g1,mode="out"))

## V1 V2 V3 V4 V5 V6 V7 V8 V9
##  0.01471  0.01408  0.01351  0.01408  0.01429  0.01408
0.01389  0.01408  0.01389
## V10 V11 V12 V13 V14 V15 V16 V17 V18
##  0.01389  0.01408  0.01389  0.01429  0.01389  0.01408
0.01429  0.02041  0.01449
## V19 V20 V21 V22 V23 V24 V25
##  0.01389  0.01449  0.01429  0.01429  0.01449  0.01449
0.01370

# compute degree(d1<-degree(g1,mode="out"))

## V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12 V13 V14
V15 V16 V17 V18
## 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
```

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V19 V20 V21 V22 V23 V24 V25
5 5 5 5 5 5 5

We have shown above how you can read an adjacency matrix as a table.
The `igraph` package also allows you to read in a dataset in which you list
the edges of a network. The file elist1.txt lists six edges:

1 2
1 3
1 4
3 5
4 6
6 4

We can read in this file as a graph, indicating that the format is an "edgelist".

```
xlist<-
read.graph("https://stats.idre.ucla.edu/stat/data/elist1.txt",format="edgelist")str(xlist)
```

IGRAPH D--- 7 6 --

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+ edges:
2->3 2->4 2->5 4->6 5->7 7->5

Looking at the summary of our graph object, R believes our graph has 7
vertices although we only listed edges ranging from vertices 1 through 6. R
makes a few assumptions unless otherwise specified:

We can amend our `read.graph` command to indicate that
our graph contains 8 vertices and that the edges are undirected. We
can then graph both and see the differences in nodes and edge
representations. Note that the plotting algorithm used does
not generate the same plot every time. In fact, it sometimes
generates plots in which vertices are crowded or overlapping or
edges are difficult to see. When this occurs, rerun the plot
command to get a new and likely better representation of your

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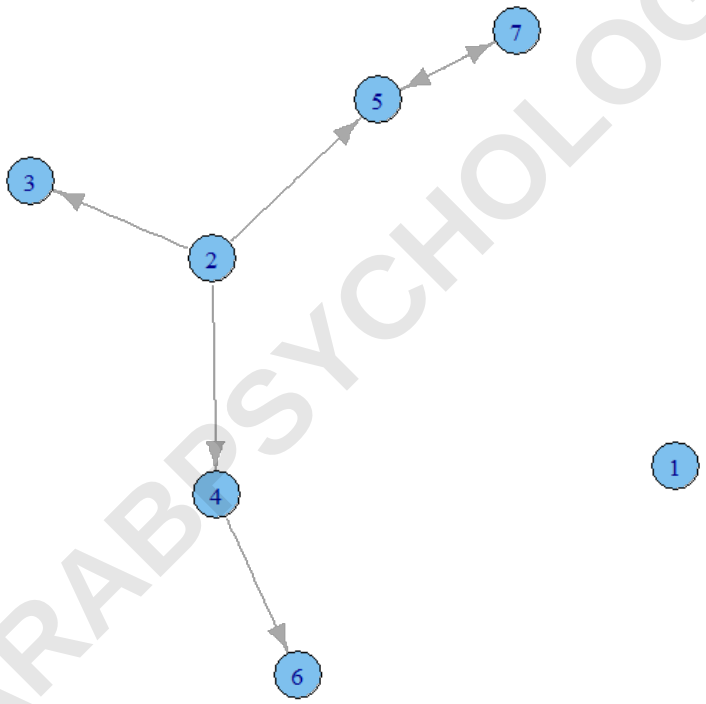
network.

```
xlist.8un<-
read.graph("https://stats.idre.ucla.edu/stat/data/elist1.txt",format="edgelist",n=8,directed=FALSE)plot.igraph(xlist)
```



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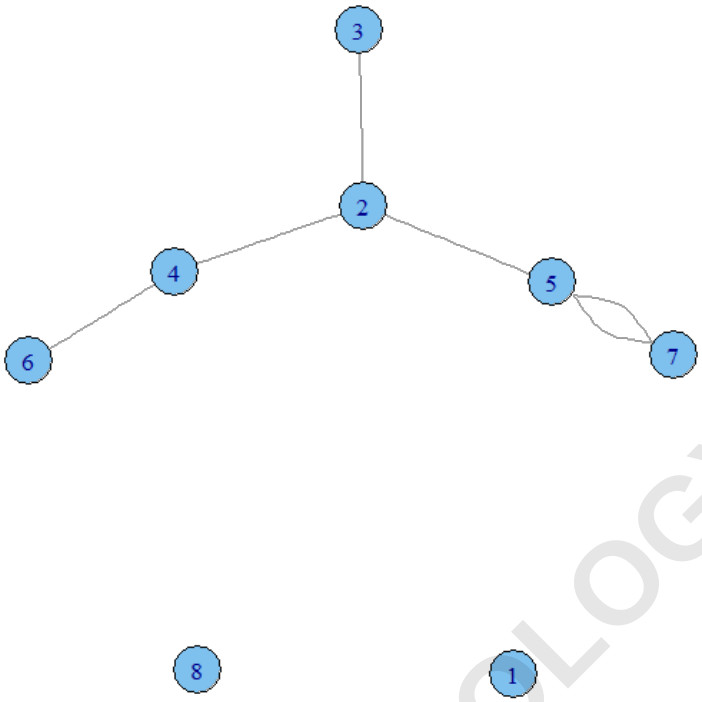
```
plot.igraph(xlist.8un)
```



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Our first graph has an unconnected 0 vertex and arrows on the
edges. Our second has unconnected 0 and 7 vertices and no arrows on
the edges. We could also enter our data in a single vector of vertex
indices where an edge connects the first and second, third and
fourth, fifth and sixth entries and so on.

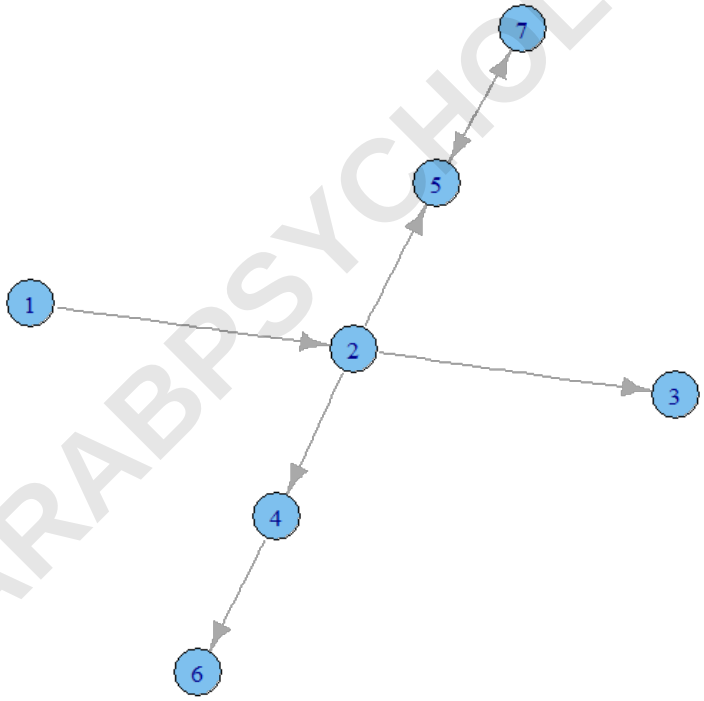
g2<-graph(c(1,2,2,3,2,4,2,5,4,6,5,7,7,5))str(g2)

IGRAPH D--- 7 7 --

+ edges:

1->2 2->3 2->4 2->5 4->6 5->7 7->5

plot.igraph(g2)



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For more information on the igraph package, see the

igraph package R-project page or the igraph library page.

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