# INDEX

# SOCIAL NETWORK ANALYSIS

Network: A network is simply a graph structure having number of vertices (nodes) that are connected by links or edges.

Social Network: A social network is a social structure represented as a graph, where the vertices are individuals or organizations, and the links are interdependencies between the vertices, representing social connection as friendship, common interests, marital/family ties or collaborative activities.

# ABOUT THE PROJECT

Social Network Analysis is a set of methods used to visualize networks, describe specific characteristics of overall network structure, and build mathematical and statistical models of network structures and dynamics. Social networks are formally defined as a set of nodes that are tied by one or more types of relations.

It is possible to analyze and study social networks in RStudio.

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In this project we will be using a small network that indicates interactions in the famous *Sanskrit epic* ***Ramayana***.

Here, each node is a character and each edge indicates the interactions of one character with another character in the epic.

# ABOUT THE CODE

- IMPORTING NETWORK DATA INTO R

  The first step is to read the data in this network with *read.csv* command.

- HOW DO WE CONVERT THIS DATASET INTO A NETWORK OBJECT IN R?
  There are multiple packages to work with networks, but the most popular is *igraph* library because it's very flexible and easy to do.

- NETWORK VISUALIZATION

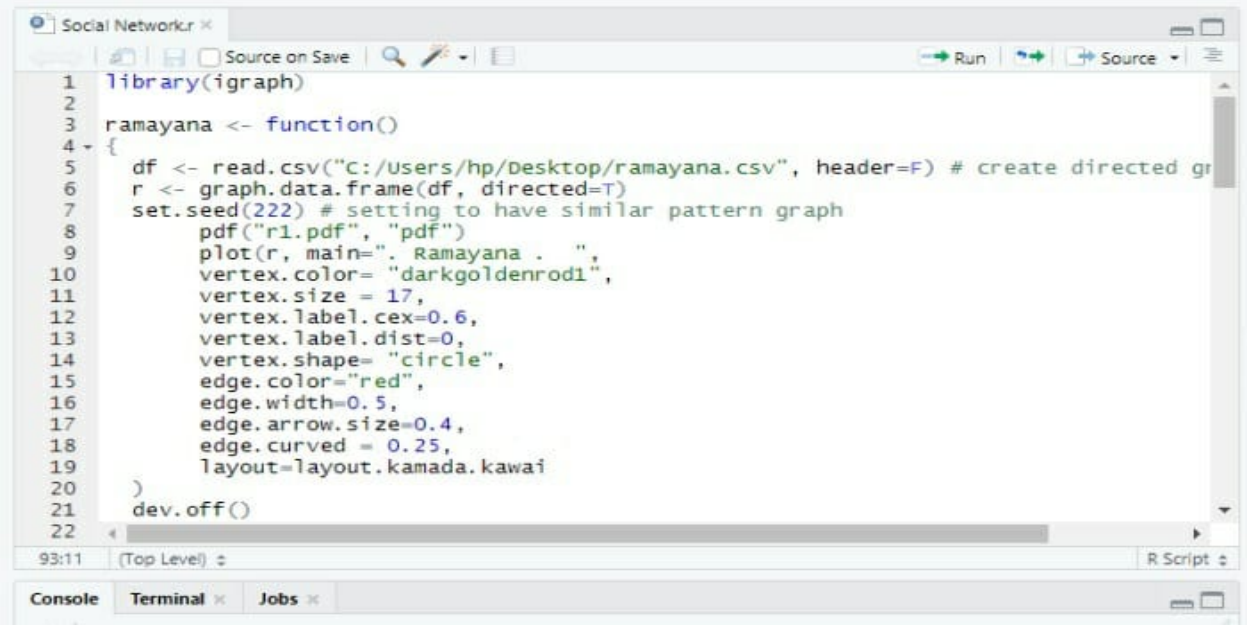
  How can we visualize this network? The *plot()* function works out of the box, but the default options are often not ideal.

- MODIFICATIONS IN PLOTTING ATTRIBUTES
  Common adjustments such as changing size/color/border of node or edges or labels can be made to show correspondence with each other in RStudio.

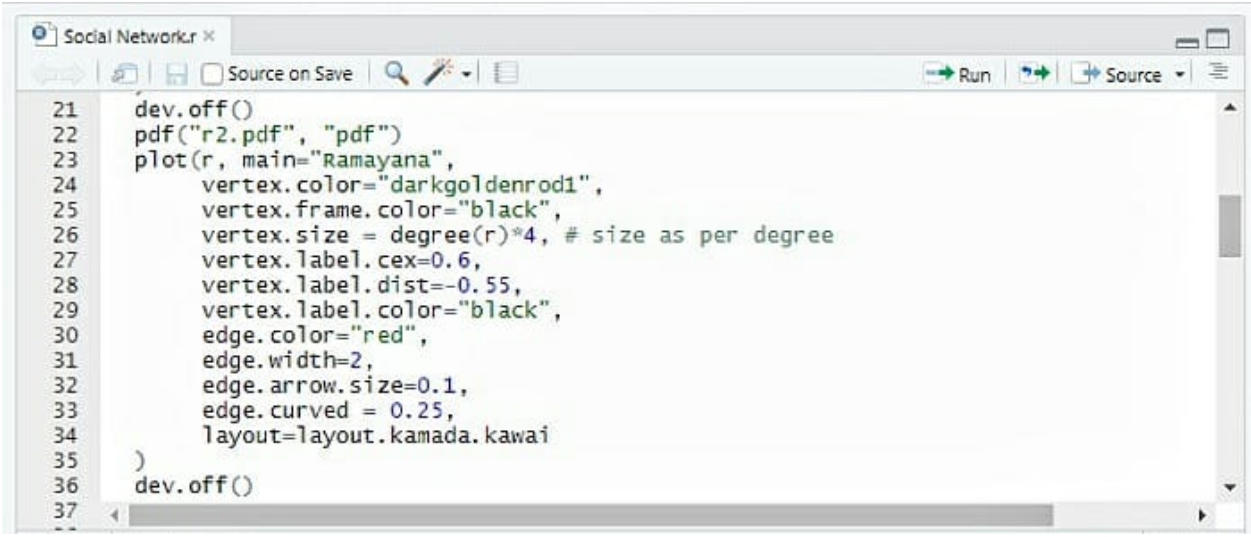
  We can also specify the layout for the plot; that is, the (x,y) coordinates where each node will be placed. *igraph* has a few different layouts built-in,
  that uses different algorithms to find an optimal distribution of nodes.

# CODING SECTION

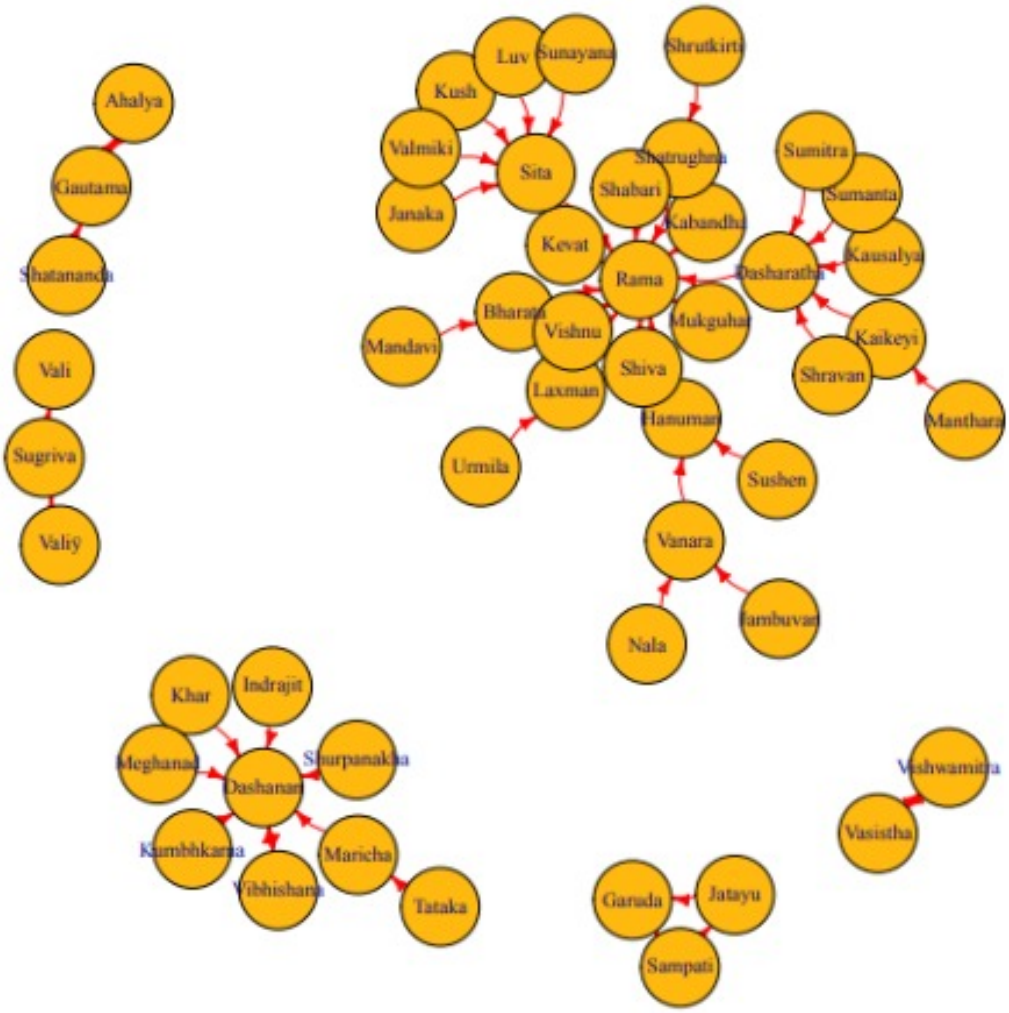
## // CODING FOR SIMPLE SOCIAL NETWORK FOR RAMAYANA CHARACTERS



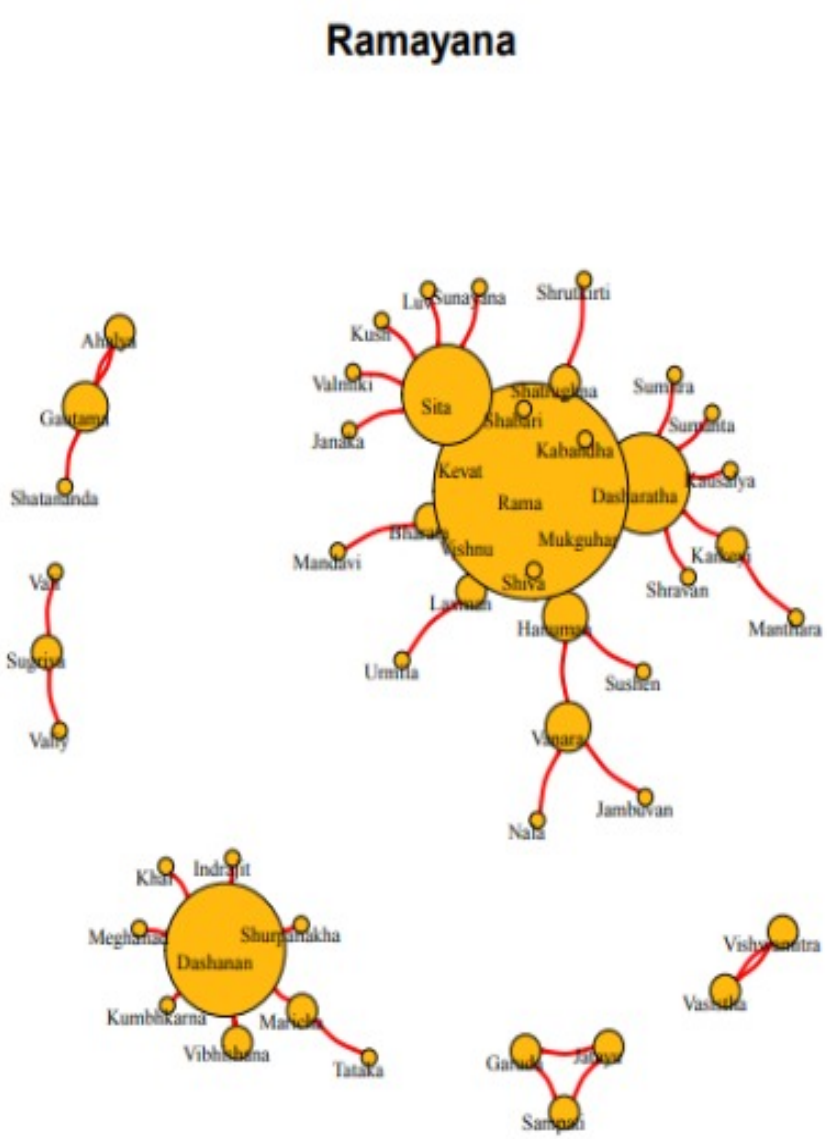

## // CODING FOR PLOTTING GRAPH 2


Social Network.r
Source on Save
Run
Source
dev.off()
pdf("r2.pdf", "pdf")
plot(r, main="Ramayana",
vertex.color="darkgoldenrod1",
vertex.frame.color="black",
vertex.size = degree(r)*4, # size as per degree
vertex.label.cex=0.6,
vertex.label.dist=-0.55,
vertex.label.color="black",
edge.color="red",
edge.width=2,
edge.arrow.size=0.1,
edge.curved = 0.25,
layout=layout.kamada.kawai
)
dev.off()

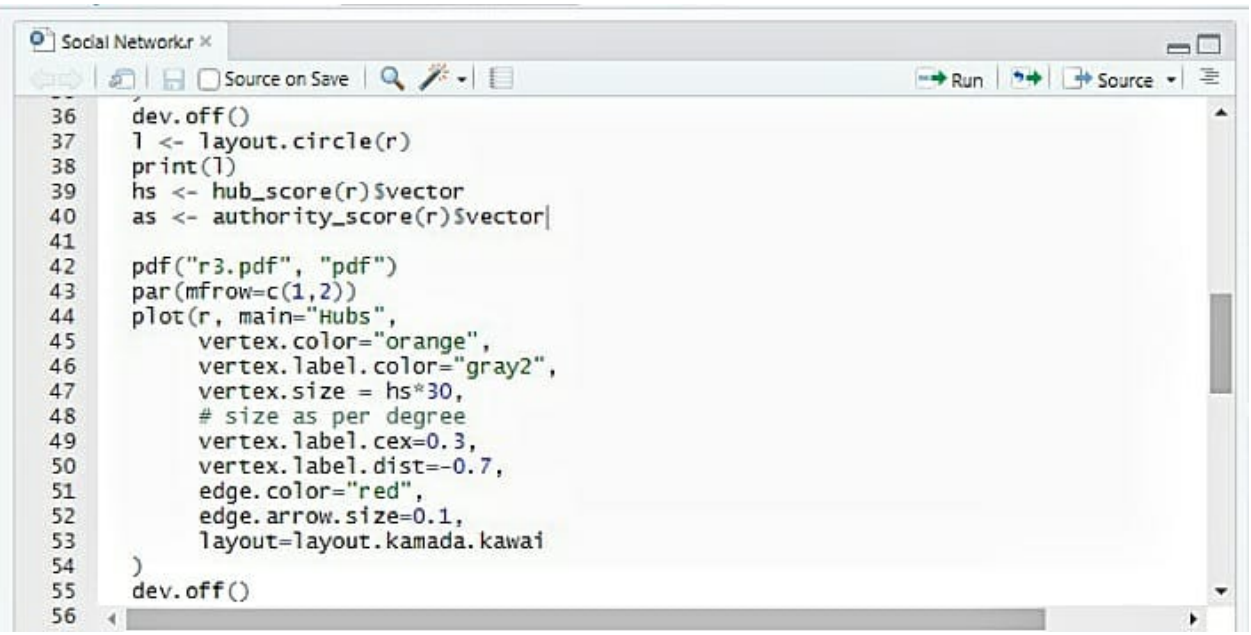
OUTPUT FOR SIMPLE NETWORK GRAPH



## OUPT[UT FOR NETWORK GRAPH (2)

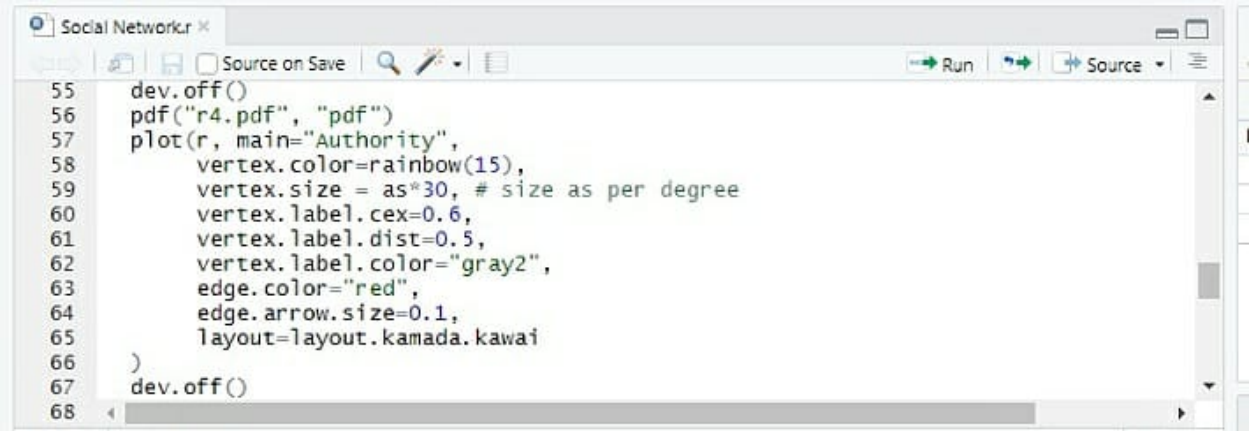


// CODING FOR PLOTTING HUB GRAPH



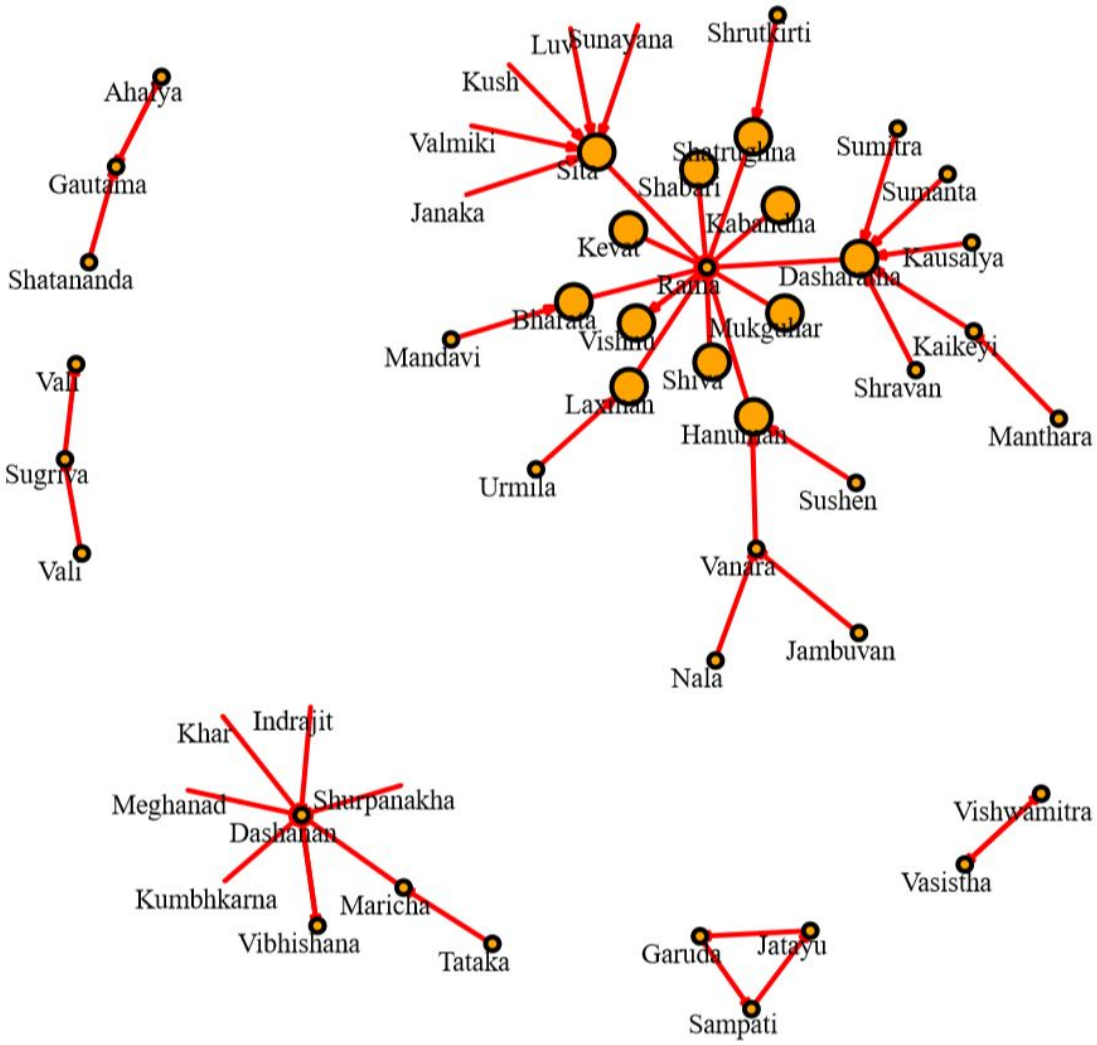

```
dev.off()
l <- layout.circle(r)
print(l)
hs <- hub_score(r)$vector
as <- authority_score(r)$vector

pdf("r3.pdf", "pdf")
par(mfrow=c(1,2))
plot(r, main="Hubs",
     vertex.color="orange",
     vertex.label.color="gray2",
     vertex.size = hs*30,
     # size as per degree
     vertex.label.cex=0.3,
     vertex.label.dist=-0.7,
     edge.color="red",
     edge.arrow.size=0.1,
     layout=layout.kamada.kawai
)
dev.off()
```

//CODING FOR PLOTTING AUTHORITY GRAPH

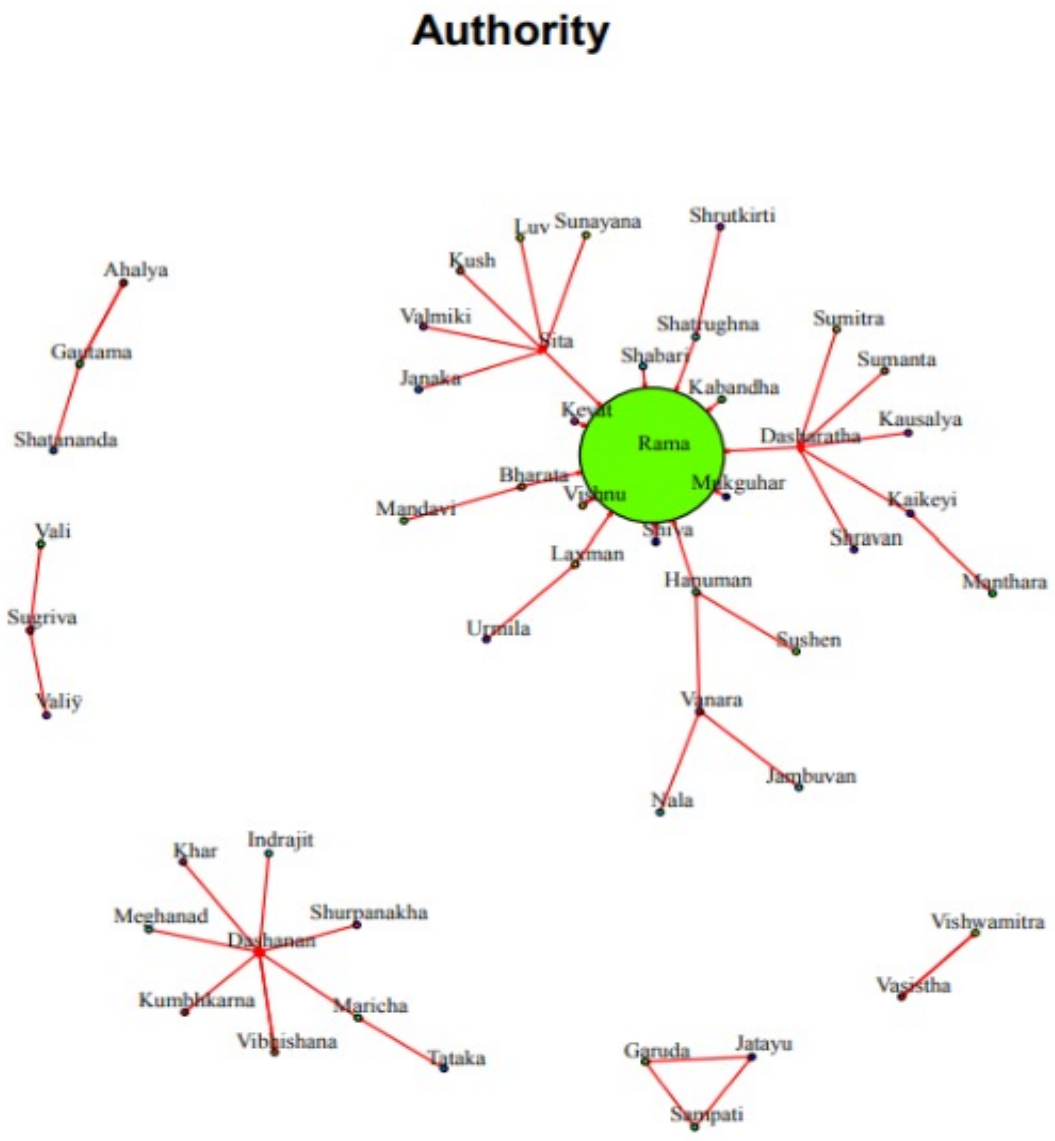



```
dev.off()
pdf("r4.pdf", "pdf")
plot(r, main="Authority",
     vertex.color=rainbow(15),
     vertex.size = as*30, # size as per degree
     vertex.label.cex=0.6,
     vertex.label.dist=0.5,
     vertex.label.color="gray2",
     edge.color="red",
     edge.arrow.size=0.1,
     layout=layout.kamada.kawai
)
dev.off()
```

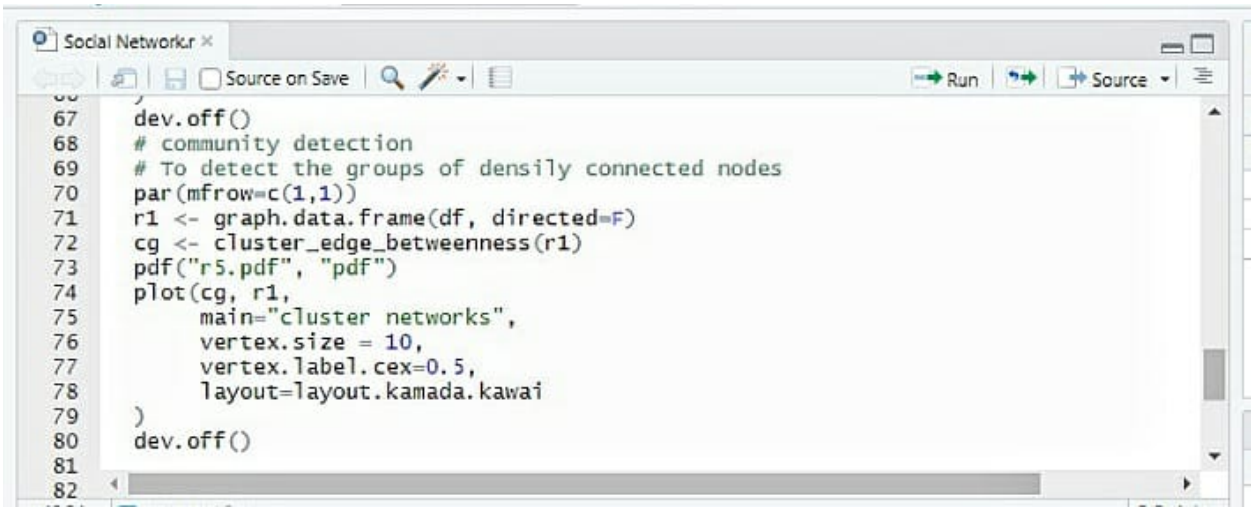
OUTPUT FOR HUB GRAPH



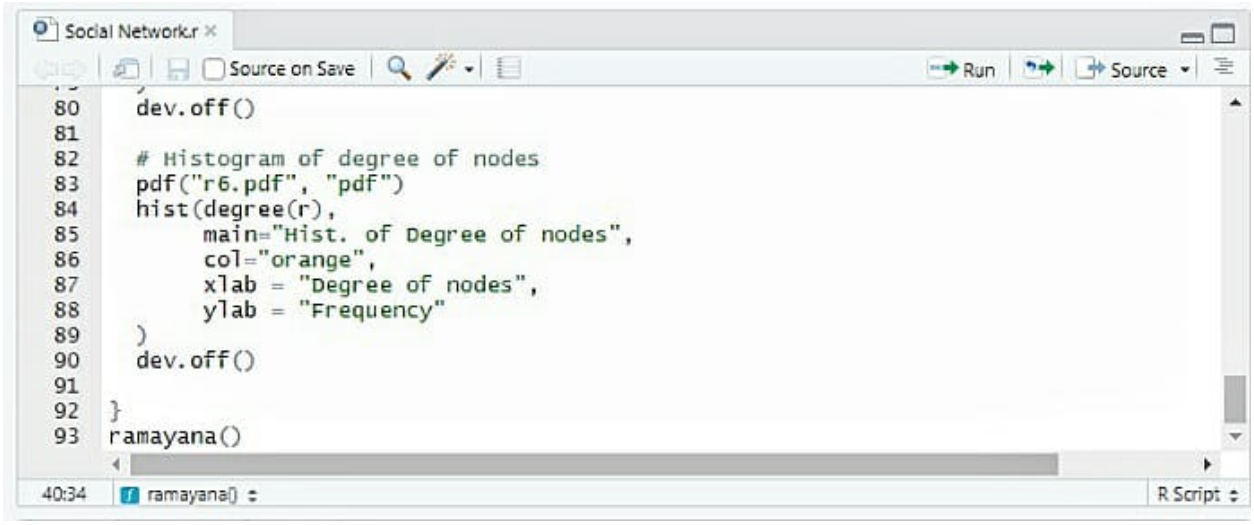
## OUTPUT FOR AUTHORITY GRAPH



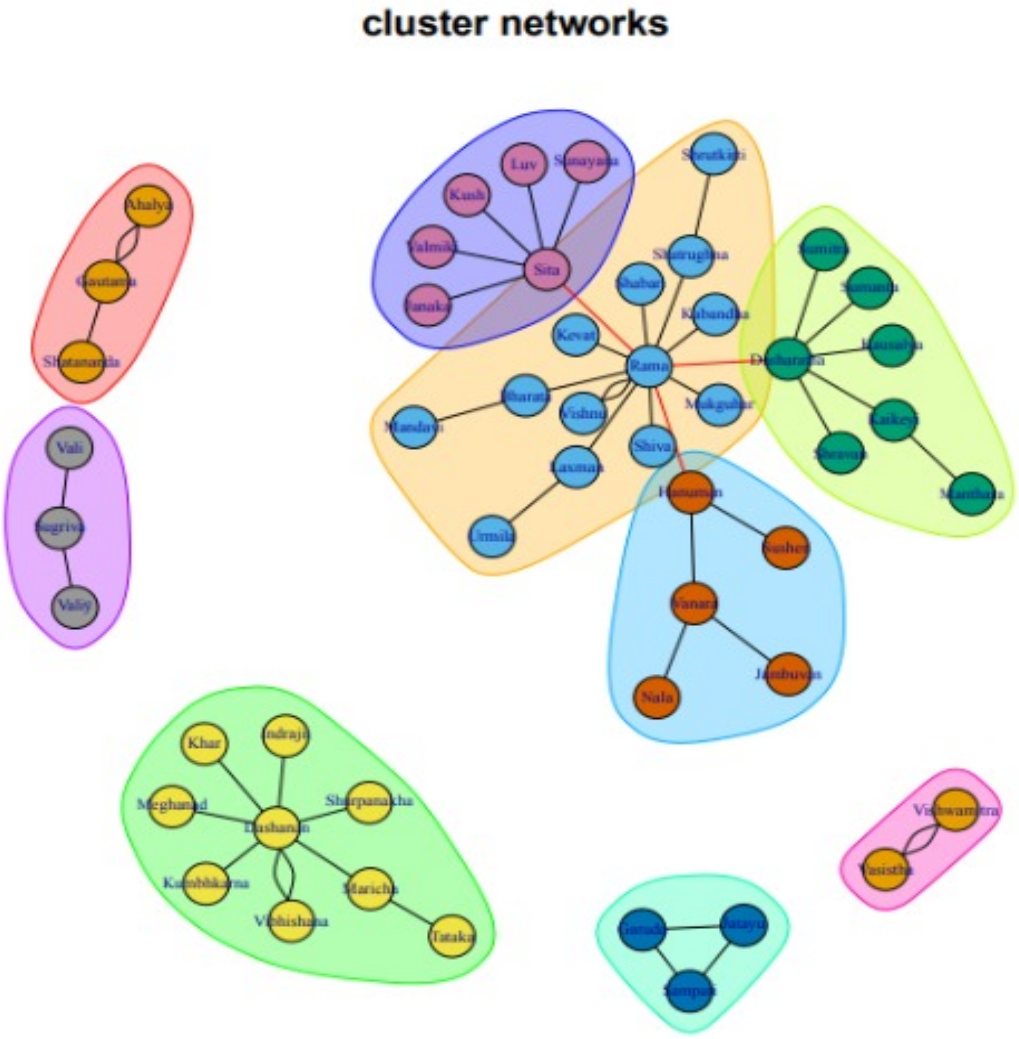
// CODING FOR PLOTTING A CLUSTER GRAPH :



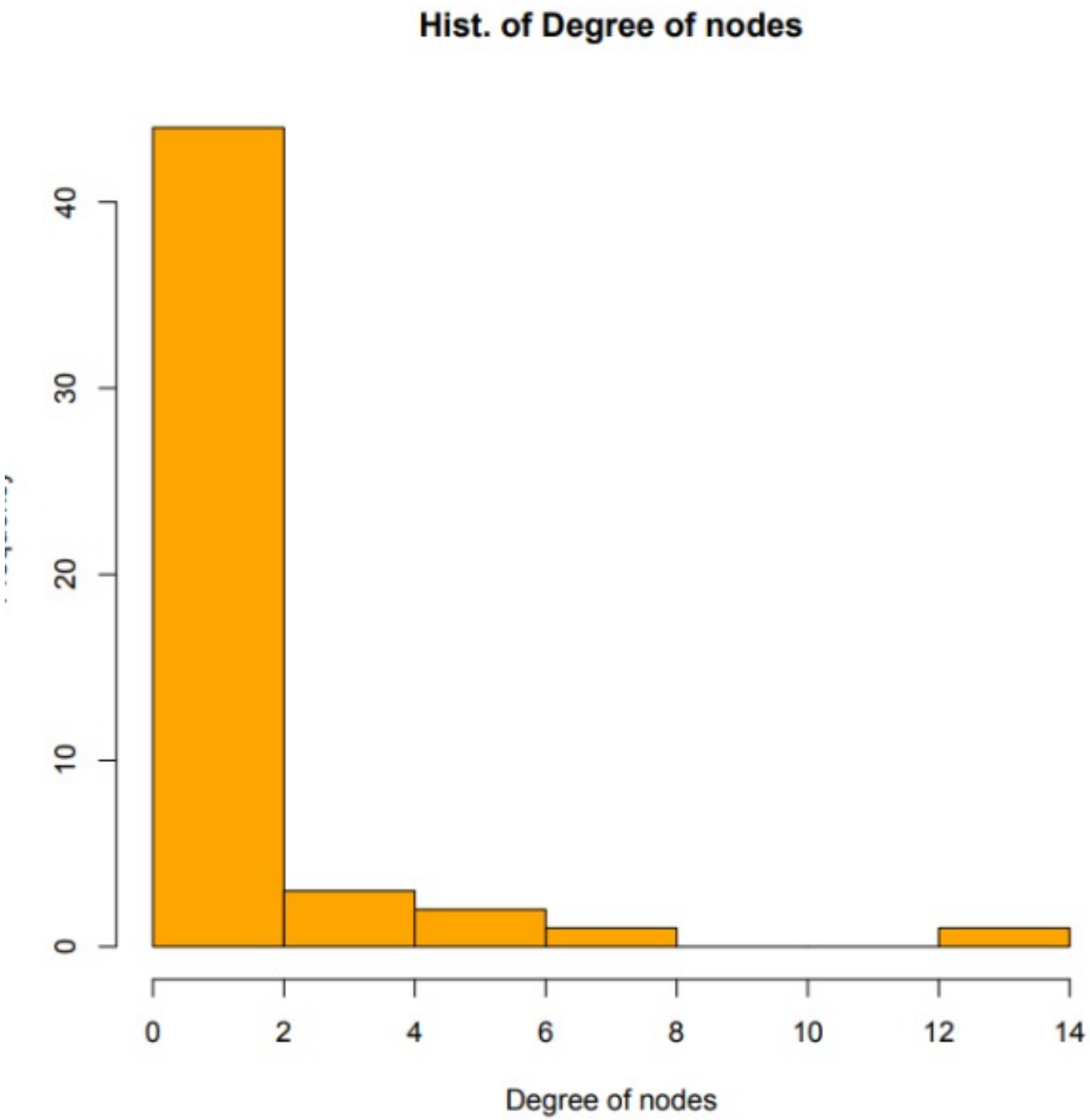

//CODING FOR PLOTTING A HISTOGRAM

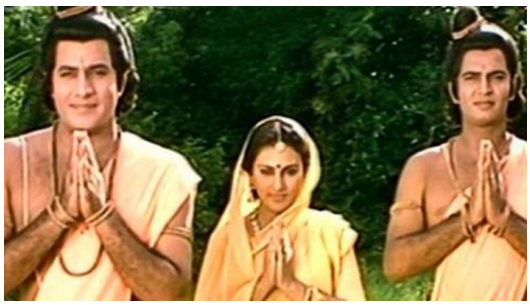


## OUTPUT FOR CLUSTER GRAPH



## HISTOGRAM OUTPUT





*THANKYOU*