



Experiment No.7
Social Network Analysis using R (for example: Community Detection Algorithm)
Date of Performance: 13/09/23
Date of Submission: 27/09/23



AIM : Social Network Analysis using R (for example: Community Detection Algorithm)

THEORY :

Online social platforms have enabled people around the world to interact with each other and

build relationships with others they share common interests with. This can be observed in real

life — naturally, we tend to develop and maintain relationships with others that are similar to

us. People with similar interests tend to gravitate towards each other and become associated

in communities — clusters or groups of people that share similar traits with each other. Since

people tend to cluster with others similar to them, we can use community detection to identify

users with a high number of degrees (connections) and see how far their reach can travel in the network.

- User Data Extraction — Since we are only interested in user data, we will only extract the following variables:
- User_id — Yelp user ID; this is needed to make nodes and edges
- Name — user's first name
- Review count — the number of reviews user has written
- Yelping since — date user joined Yelp
- Friends — a list containing all of the user's friends by user_id
- Fans — number of fans user has
- Elite — number of years the user has Elite status
- Average stars — user's average rating of all reviews written

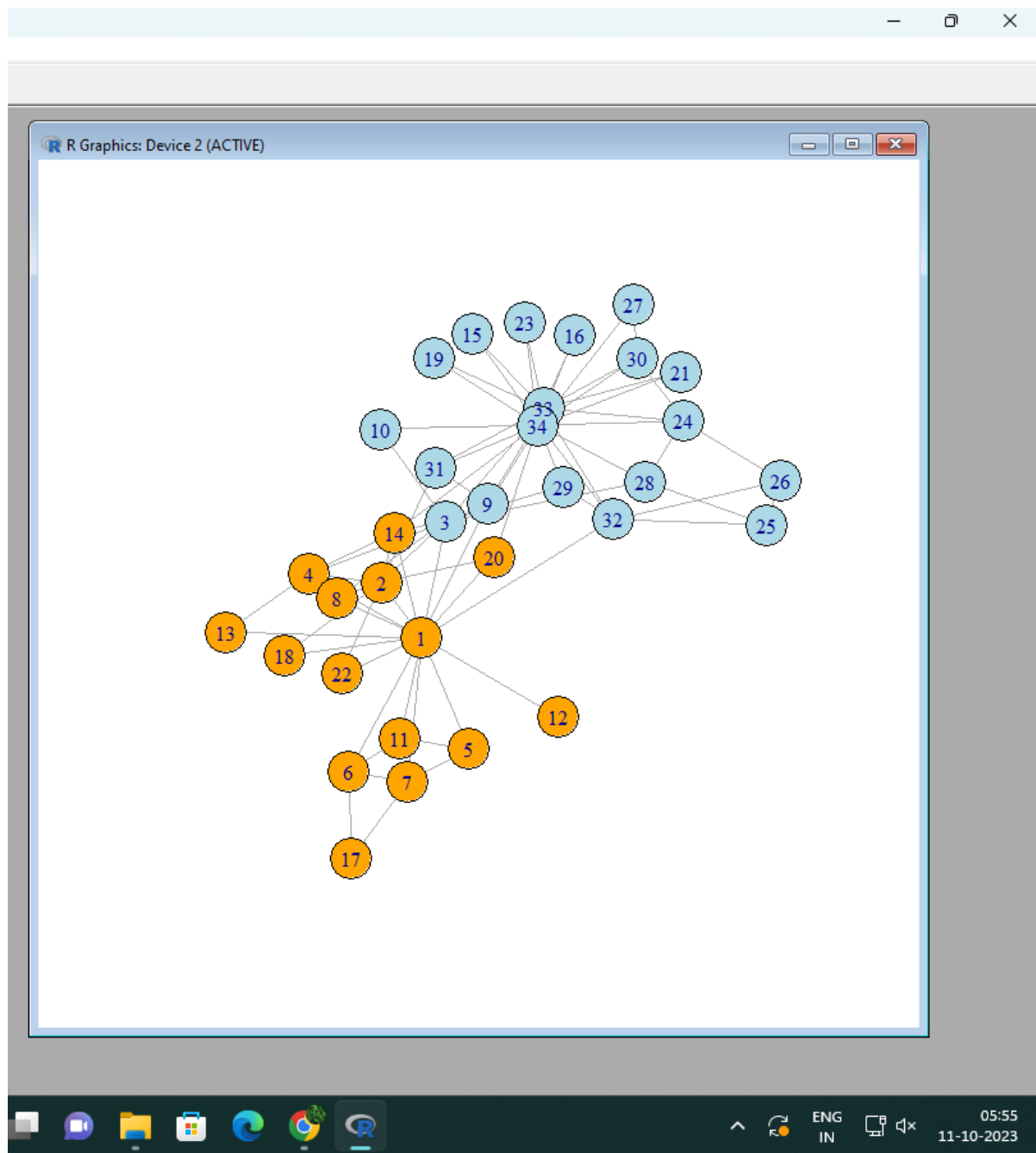


CODE :

```
library(igraph)
gizvan <- function(G) {
c= decompose. graph (G)
l = length(c)
v <= vector()
while(l==1){
x <-E(G)
y <- edge_betweenness (G)
z <- which.max(y)
edge <- x[z]
a <- ends (G,z[1]) [1]
b <- ends(G,z[1]) [2]
v <- c(v,a,b)
G <- delete_edges (G, edge)
c = decompose.graph (G)
l=length(c)
}
if(l==2){
paths <- shortest.paths (G)
for(i in 1:Vcount(V(G))){
if (paths[a, i] !=Inf) {
V(G) [i]$color = "lightblue"
}
else{
V(G) [i]$color = "orange"
}
}
G <- G + edge(v)
plot(G)
}
return(c)
}
g <- read.graph("C:/Users/admin/Desktop/CommunityDetection/karate.gml",format =
"gml")
plot(g)
c <- girvan(g)
```



OUTPUT :





CONCLUSION :

The experiment delving into Social Network Analysis using R, with a particular emphasis on Community Detection Algorithms, unveils a robust and dynamic tool for comprehending the intricate structures of social networks. R's versatility, coupled with its wealth of packages, positions it as an ideal platform for conducting this analysis. The realm of Social Network Analysis remains in a constant state of evolution, consistently evolving to meet new challenges and providing invaluable insights across diverse domains, spanning from online platforms to real-world communities. These insights hold the potential to inform decision-making and strategy development across a wide array of disciplines.