



Experiment No.7
Social Network Analysis using R (for example: Community Detection Algorithm)
Date of Performance: 11/09/23
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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

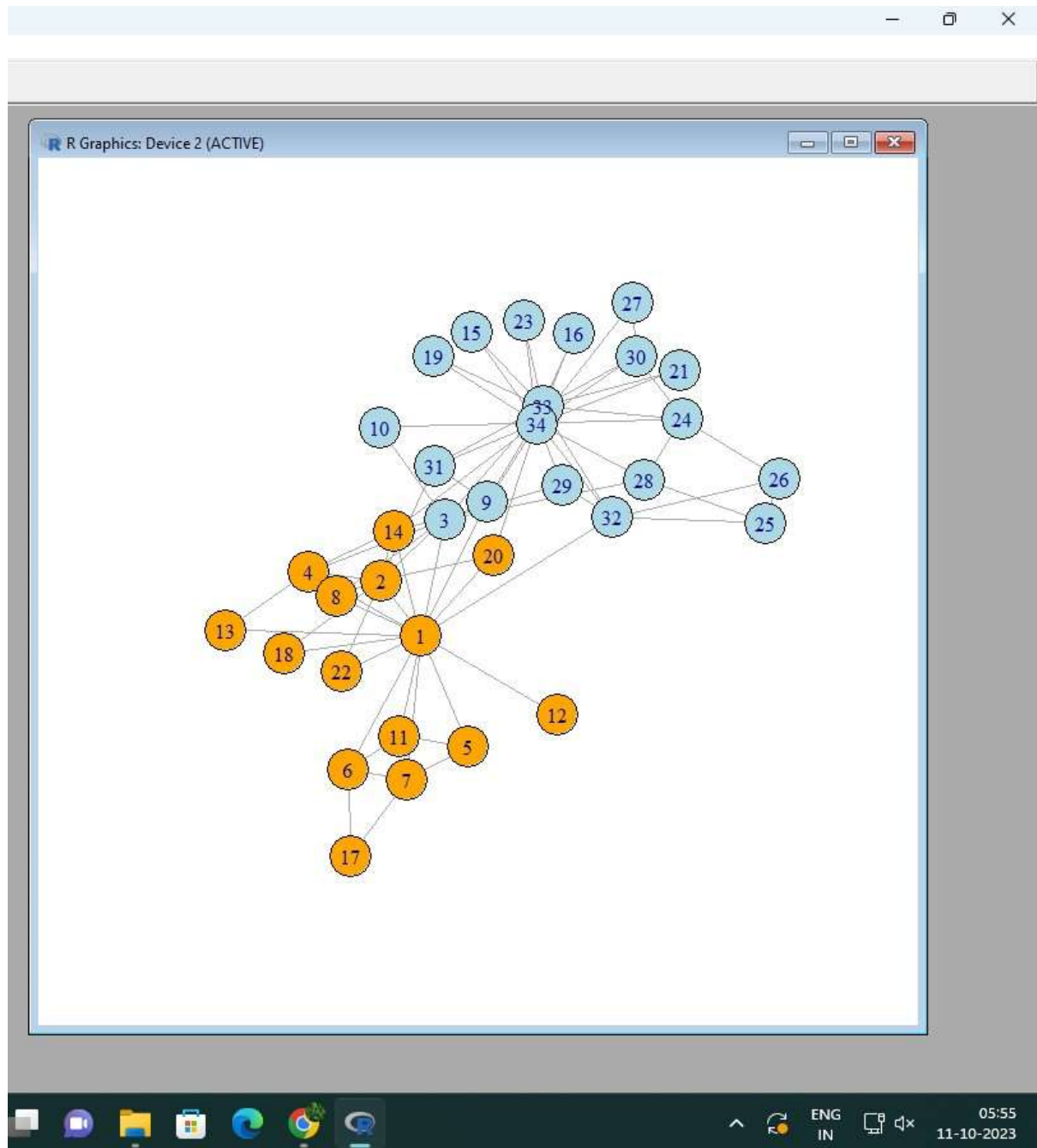
CODE:

```
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:length(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 :

utilizing R for social network analysis, particularly with community detection algorithms, is a powerful approach to uncovering insights within network structures. Analysing social networks using R and community detection algorithms provides a powerful means to uncover hidden patterns, understand network dynamics, and identify subgroups within networks. This approach is highly versatile and applicable across various fields, offering valuable insights into the structure and behaviour of social networks.