



54 – Sahil Kabir

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



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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

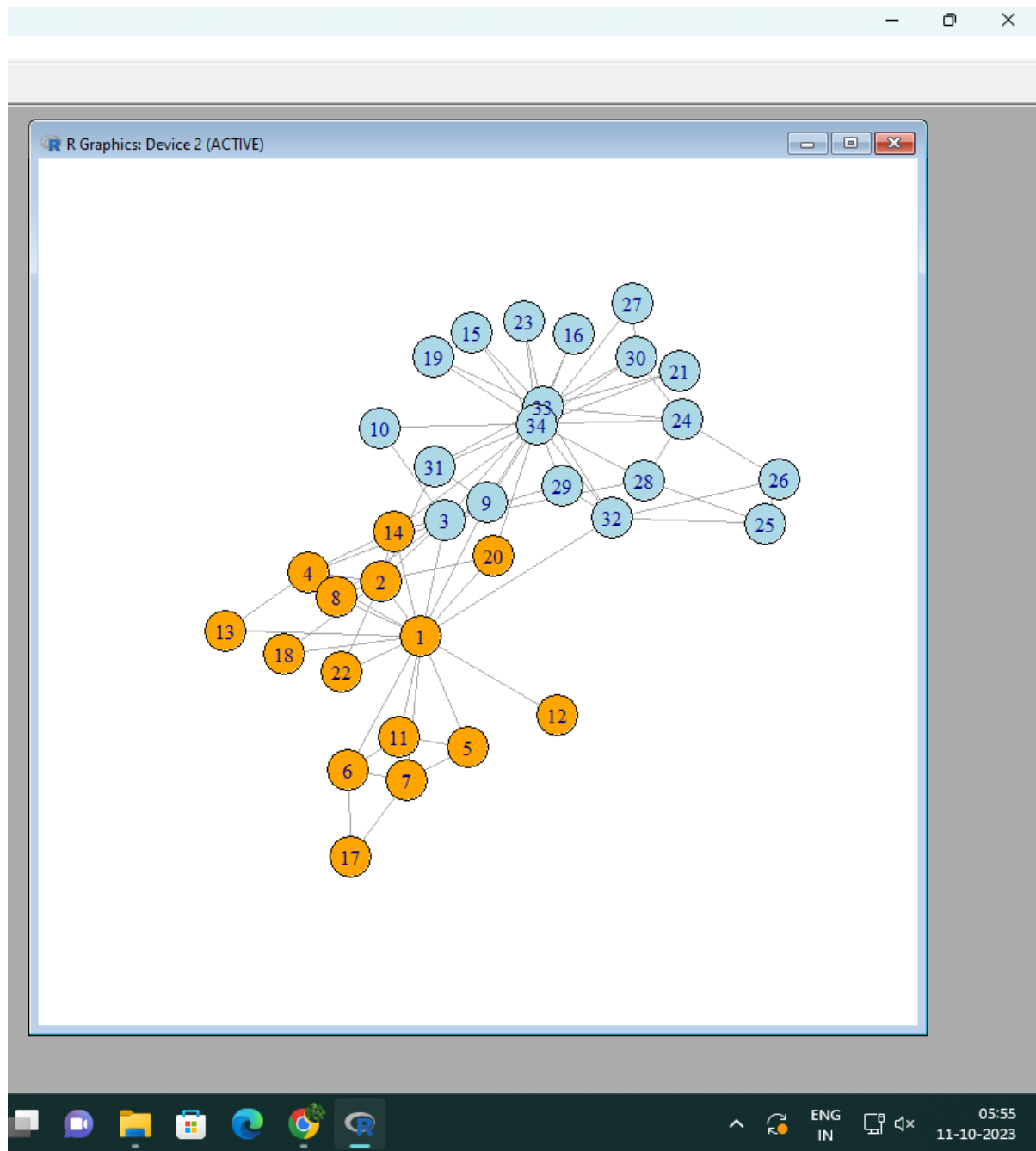


CODE:

```
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: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/ComunityDetection/karate.gml",format =
"gml")
plot(g)
c <- girvan(g)
```



OUTPUT :





CONCLUSION :

Certainly, social network analysis with R and community detection algorithms enables a deeper understanding of network structures. It helps us identify clusters of individuals with shared interests or connections, facilitating more targeted and effective decision-making. This approach has widespread applications, from improving online community management to enhancing recommendation systems and understanding the dynamics of human interactions in various social contexts.