

Practical 1: Write a program to compute the following for a given a network: (i) number of edges, (ii) number of nodes; (iii) degree of node; (iv) node with lowest degree; (v) the adjacency list; (vi) matrix of the graph.

Code:

```
# Install and load the igraph package
install.packages("igraph")
library(igraph)

# Create a graph object 'g' using graph.formula function with edges 1-2, 1-3,
2-3, 2-4, 3-5, 4-5, 4-6, 4-7, 5-6, 6-7
g <- graph.formula(1-2, 1-3, 2-3, 2-4, 3-5, 4-5, 4-6, 4-7, 5-6, 6-7)

# Plot the graph object 'g'
plot(g)

# Count the number of edges in 'g'
ecount(g)

# Count the number of vertices in 'g'
vcount(g)

# Calculate the degree of each vertex in 'g'
degree(g)

# Create another graph object 'dg' using graph.formula function with edges 1-
>2, 1->3, 2<-3
dg <- graph.formula(1->2, 1->3, 2<+3)

# Plot the graph object 'dg'
plot(dg)

# Calculate the in-degree of each vertex in 'dg'
degree(dg, mode="in")

# Calculate the out-degree of each vertex in 'dg'
degree(dg, mode="out")

# Print the name of the vertex with the minimum degree in 'dg'
V(dg)$name[degree(dg)==min(degree(dg))]

# Print the name of the vertex with the maximum degree in 'dg'
V(dg)$name[degree(dg)==max(degree(dg))]
```

```
# Find the neighbors of vertex 5 in 'g'
neighbors(g,5)

# Find the neighbors of vertex 2 in 'g'
neighbors(g,2)

# Get the adjacency list of 'dg'
get.adjlist(dg)

# Get the adjacency matrix of 'g'
get.adjacency(g)
```

OUTPUT

