Exercise 2

2024-03-23

```
# Load necessary librariesyes
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(igraph)
```

```
##
## Attaching package: 'igraph'
```

```
## The following objects are masked from 'package:dplyr':
##
##     as_data_frame, groups, union
```

```
## The following objects are masked from 'package:stats':
##
##     decompose, spectrum
```

```
## The following object is masked from 'package:base':
##
##     union
```

```
library(tidygraph)
```

```
##
## Attaching package: 'tidygraph'
```

```
## The following object is masked from 'package:igraph':
##
##      groups
```

```
## The following object is masked from 'package:stats':
##
##      filter
```
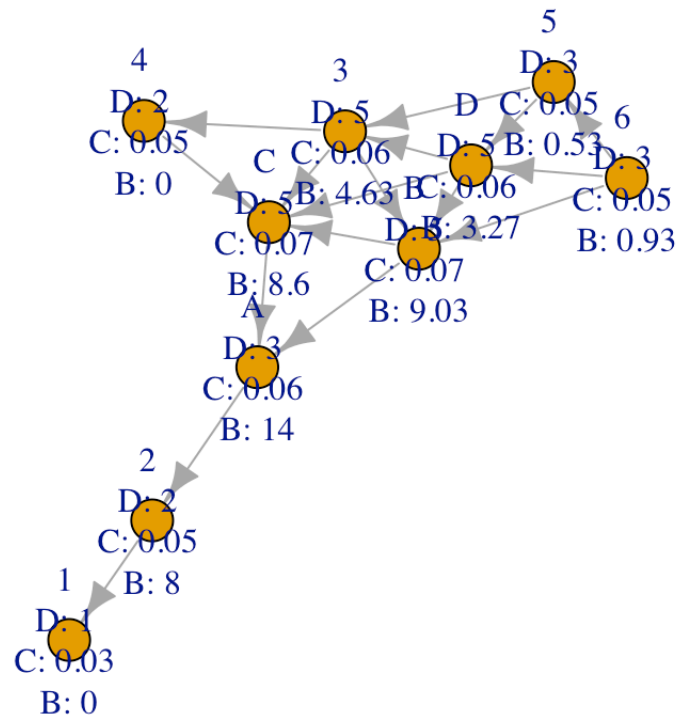
```
library(visNetwork)
```

```
# Read the dataset
df = read.csv("/Users/lauray/Documents/GitHub/2024-ona-assignments/Exercise 2/FACEBOO
K.csv")
```

```
# create the graph
graph = graph_from_data_frame(df, directed = TRUE)
```

```
degree_centrality <- degree(graph, mode = "all")
closeness_centrality <- closeness(graph, mode = "all")
betweenness_centrality <- betweenness(graph, directed = FALSE)
```

```
# Use these variables correctly in the labeling
labels <- paste(V(graph)$name,
                "\nD:", round(degree_centrality, 2),
                "\nC:", round(closeness_centrality, 2),
                "\nB:", round(betweenness_centrality, 2))

# Use one of the layouts in the plot
plot(graph, vertex.label = labels)
```

5
D: 3
C: 0.05

4
D: 2
C: 0.05
B: 0

3
D: 5
C: 0.06

6
D: 3
C: 0.05
B: 0.93

D
D: 5 B: 0.53

C
D: 5 B: 4.63

D: 5
C: 0.06
B: 3.27

D: 5
C: 0.07
B: 8.6

A
D: 3
C: 0.06
B: 14

D: 5
C: 0.07
B: 9.03

2
D: 2
C: 0.05
B: 8

1
D: 1
C: 0.03
B: 0

```
visNetwork::visIgraph(graph) %>%
   visNetwork::visLayout(randomSeed = 123)
```

```
edges_data <- get.data.frame(graph, what = "edges")
```

```
## Warning: `get.data.frame()` was deprecated in igraph 2.0.0.
## ℹ Please use `as_data_frame()` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

```
nodes_data <- data.frame(
  id = V(graph)$name,
  label = paste(V(graph)$name,
              "\nD:", round(degree_centrality, 2),
              "\nC:", round(closeness_centrality, 2),
              "\nB:", round(betweenness_centrality, 2), sep=" "),
  value = degree_centrality
)

visNetwork(nodes_data, edges_data) %>%
  visNodes(shape = 'dot', size = 10) %>%
  visEdges(arrows = 'to') %>%
  visOptions(highlightNearest = TRUE, nodesIdSelection = TRUE) %>%
  visLayout(randomSeed = 123)
```

2
D: 2
C: 0.05
B: 8

1
D: 1
C: 0.03
B: 0

A
D: 3
C: 0.06
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D: 5
C: 0.07
B: 9.03

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D
D: 5
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B: 3.27

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D: 3
C: 0.05
B: 0.53

C
D: 5
C: 0.07
B: 8.6

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D: 5
C: 0.06
B: 4.63

4
D: 2
C: 0.05
B: 0