

# ex2-ona

Jessica Quansah

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## Load Data

```
library(tidygraph)
```

```
##  
## Attaching package: 'tidygraph'  
  
## The following object is masked from 'package:stats':  
##  
## filter
```

```
library(igraph)
```

```
##  
## Attaching package: 'igraph'  
  
## The following object is masked from 'package:tidygraph':  
##  
## groups  
  
## The following objects are masked from 'package:stats':  
##  
## decompose, spectrum  
  
## The following object is masked from 'package:base':  
##  
## union
```

```
library(readr)  
library(ggraph)
```

```
## Loading required package: ggplot2
```

```
library(ggplot2)  
edges <- read_csv("C:/Users/tobuy/OneDrive/Documents/GitHub/desktop-tutorial/Exercise-2/ex2_edges.csv")
```

```
## Rows: 34 Columns: 2
```

```

## -- Column specification -----
## Delimiter: ","
## chr (2): from, to
##
## i Use 'spec()' to retrieve the full column specification for this data.
## i Specify the column types or set 'show_col_types = FALSE' to quiet this message.

nodes <- read_csv("C:/Users/tobuy/OneDrive/Documents/GitHub/desktop-tutorial/Exercise-2/ex2_nodes.csv")

## Rows: 10 Columns: 1
## -- Column specification -----
## Delimiter: ","
## chr (1): seat
##
## i Use 'spec()' to retrieve the full column specification for this data.
## i Specify the column types or set 'show_col_types = FALSE' to quiet this message.

# Create graph
g <- tbl_graph(nodes = nodes, edges = edges, directed = FALSE)

# Calculate degree centrality for nodes
g <- g %>%
  activate(nodes) %>%
  mutate(degree = centrality_degree())

# Calculate closeness centrality for nodes
g <- g %>%
  activate(nodes) %>%
  mutate(closeness = centrality_closeness())

# Calculate betweenness centrality
g <- g %>%
  activate(nodes) %>%
  mutate(betweenness = centrality_betweenness())
print(g)

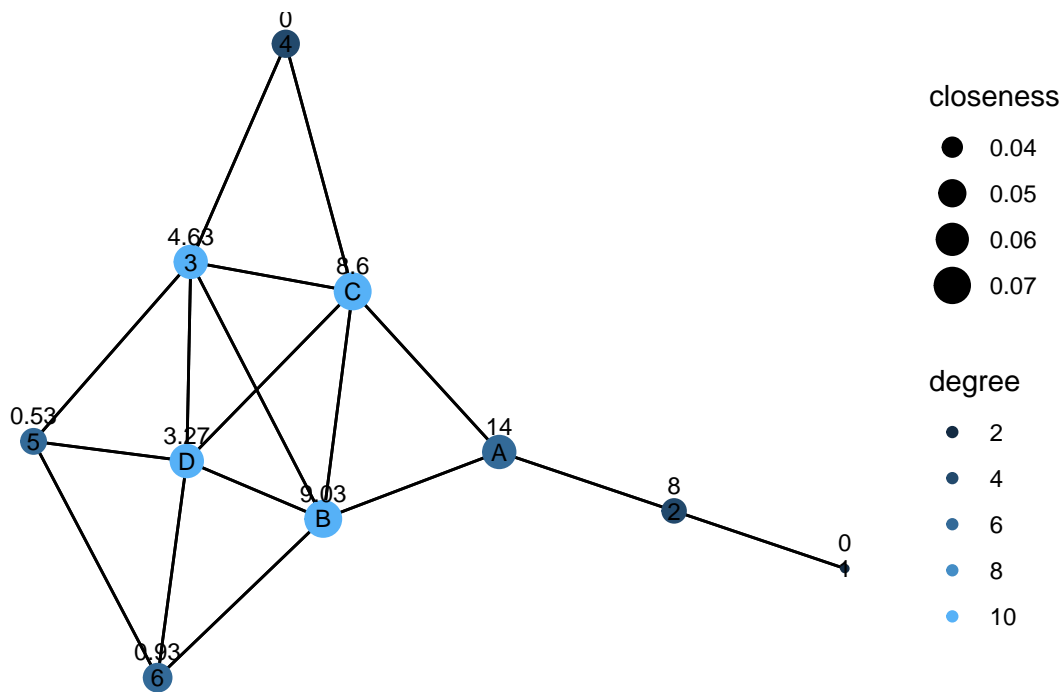
## # A tbl_graph: 10 nodes and 34 edges
## #
## # An undirected multigraph with 1 component
## #
## # Node Data: 10 x 4 (active)
##   seat degree closeness betweenness
##   <chr>  <dbl>    <dbl>        <dbl>
## 1 1      2      0.0333         0
## 2 2      4      0.0455         8
## 3 3     10      0.0625        4.63
## 4 4      4      0.05          0
## 5 5      6      0.0476        0.533
## 6 6      6      0.0526        0.933
## 7 A      6      0.0625        14
## 8 B     10      0.0714        9.03
## 9 C     10      0.0714         8.6
## 10 D    10      0.0625         3.27

```

```
## #
## # Edge Data: 34 x 2
##   from   to
##   <int> <int>
## 1     5     6
## 2     6    10
## 3     6     8
## # i 31 more rows
```

```
# Plot the graph
graph_plot <- g %>%
  ggraph(layout = 'kk') +
  geom_edge_link() +
  geom_node_point(aes(size = closeness, colour = degree)) +
  scale_color_continuous(guide = 'legend') +
  geom_node_text(aes(label = seat), size = 3) + # Add seat names as labels inside nodes
  geom_node_text(aes(label = round(betweenness, 2)), vjust = -1, size = 3) + # Add betweenness centrality
  theme_graph(base_family = "Helvetica")

graph_plot
```



## ##Discussion

The objective was to select a seat (A-D) on the Fakebook Employee bus that would facilitate the development of informal connections with my co-workers. To accomplish this, I wanted a seat that not only allowed for interactions with a larger number of individuals (degree centrality), but also one that maximized my betweenness and closeness centrality. In light of these criteria, I chose seat B.

Seat B offered several advantages in terms of optimizing my network centrality. It has a high degree centrality, enabling direct engagement with multiple individuals. Moreover, it excelled in both betweenness and closeness centrality. This meant that seat B acted as a bridge, connecting individuals who may not have had direct connections with one another, thereby enhancing my influence and facilitating the flow of information within the network.

Although seat A exhibited a higher betweenness centrality due to its direct connection to seat B, it had a lower degree centrality. Nevertheless, I believed I could still leverage the betweenness centrality advantage of seat A by utilizing my direct connection to that seat.

Nonetheless Seat B could also be disadvantageous if someone I do not have any “direct” access like the person in seat 1 was a person of influence who did not like to interact with outsiders (i.e. kept his circle type). As such by prioritizing degree centrality as well, I may have missed out on an opportunity to develop that connection. Similarly, this seat may also not be helpful in developing deep connections because my access is so open so I may tend to have general conversations that involve everyone rather than truly getting to know someone and developing a deep connection with them.