Fakebook Bus Seat Selection Analysis

Meriem Mehri

```
r format(Sys.Date(), '%B %d, %Y')
```

```
{r setup, include=FALSE} knitr::opts_chunk$set(echo = TRUE,
fig.align='center', fig.show='hold') library(tidygraph)
library(ggraph) library(dplyr) library(ggplot2)
```

Introduction

This document provides an analysis of the seating arrangement on the Fakebook company bus. As a new intern, selecting the right seat is critical for fostering connections within the company. The seats are analyzed based on their centrality measures within the network.

Network Centrality Measures

First, we calculate the centrality measures for each seat to understand their importance within the network.

```{r centrality-measures, echo=TRUE} # Define the edges of the seating arrangement edges <- tribble( ~from, ~to, “1”, “2”, “1”, “A”, “1”, “B”, “2”, “1”, “2”, “3”, “2”, “A”, “3”, “2”, “3”, “4”, “3”, “B”, “3”, “C”, “4”, “3”, “4”, “5”, “4”, “C”, “5”, “4”, “5”, “6”, “5”, “D”, “6”, “5”, “6”, “B”, “6”, “D”, “A”, “1”, “A”, “2”, “A”, “B”, “B”, “A”, “B”, “1”, “B”, “3”, “B”, “6”, “B”, “D”, “C”, “3”, “C”, “4”, “C”, “D”, “D”, “C”, “D”, “5”, “D”, “6”, “D”, “B” ) %>% as_tbl_graph(directed = FALSE) %>% activate(nodes) %>% mutate(name = as.character(name))

## Calculate centrality measures for the network

centrality_measures <- edges %>% mutate(degree = centrality_degree(), closeness = centrality_closeness(), betweenness = centrality_betweenness(), color = case_when( name %in% c(“A”, “B”, “C”, “D”) ~ ‘red’, TRUE ~ ‘blue’ ))

## Print centrality measures for chosen seats

chosen_seats <- centrality_measures %>% filter(name %in% c(“A”, “B”, “C”, “D”)) %>% arrange(name)

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Seating Arrangement Network Plot
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Next, we visualize the network plot with the calculated centrality measures.

```{r network-plot, fig.cap="Network plot showing the centrality measures for the seating arrangement on the Fakebook bus.", fig.width=7, fig.height=7, echo=FALSE}
# Plot the network
network_plot <- ggraph(centrality_measures, layout = 'stress') +
  geom_edge_link(edge_width = 1, color = 'gray') +
  geom_node_point(aes(color = color), size = 8) +
  geom_node_text(aes(label = name), repel = TRUE, fontface = "bold", color = "black") +
  theme_graph() +
  labs(title = "Bus Seating Arrangement and Centrality Measures",
       subtitle = "Highlighting Seats A, B, C, D") +
  scale_color_manual(values = c('red', 'blue'), labels = c("Chosen Seats", "Other Seats")) +
  guides(color = guide_legend(title = "Seat Type")) +
  theme(legend.position = "bottom", legend.title = element_text(size = 10), legend.text = element_text(size = 8))

network_plot
```

Interpretation of Centrality Measures

The network plot highlights Seats A, B, C, and D as potential choices for the new intern at Fakebook, shown in red. These seats are analyzed based on their centrality within the bus social network.

- **Seat A**: High betweenness but lower degree centrality. Ideal for an intern looking to bridge different social clusters, potentially influencing the network's communication flow.
- **Seat B**: Offers the highest degree centrality, suggesting it is