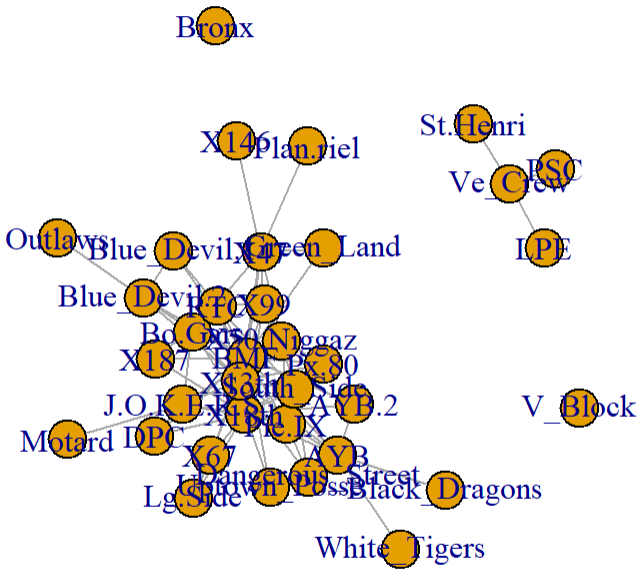
Montreal Gangs

2024-04-17

1. Data

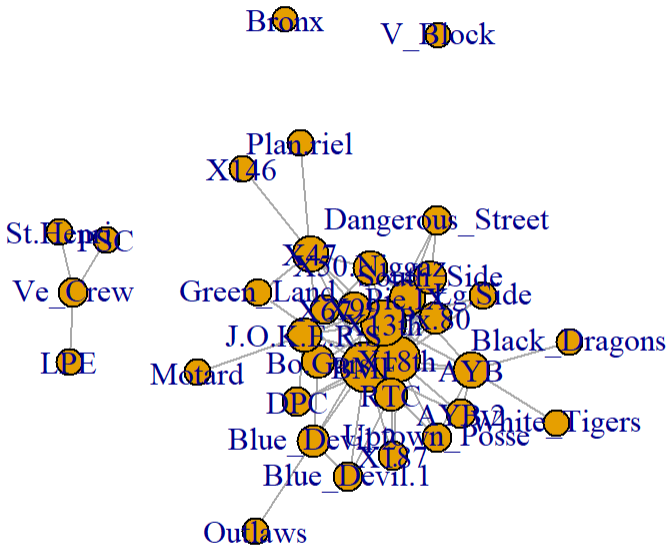
Network representing relationships between gangs, obtained from Montreal Police's central intelligence database, spanning 2004 to 2007. Nodes are gangs, and an edge represents some kind of relationship between two gangs (as elicited from interviews with gang members).

```
data <- read.csv("montreal/MONTREALGANG.csv", header = TRUE, row.names = 1)

adj_matrix <- as.matrix(data)
net <- graph_from_adjacency_matrix(adj_matrix, mode = "max", weighted = TRUE, diag = FALSE)
plot(net, layout = layout_nicely(net))
```



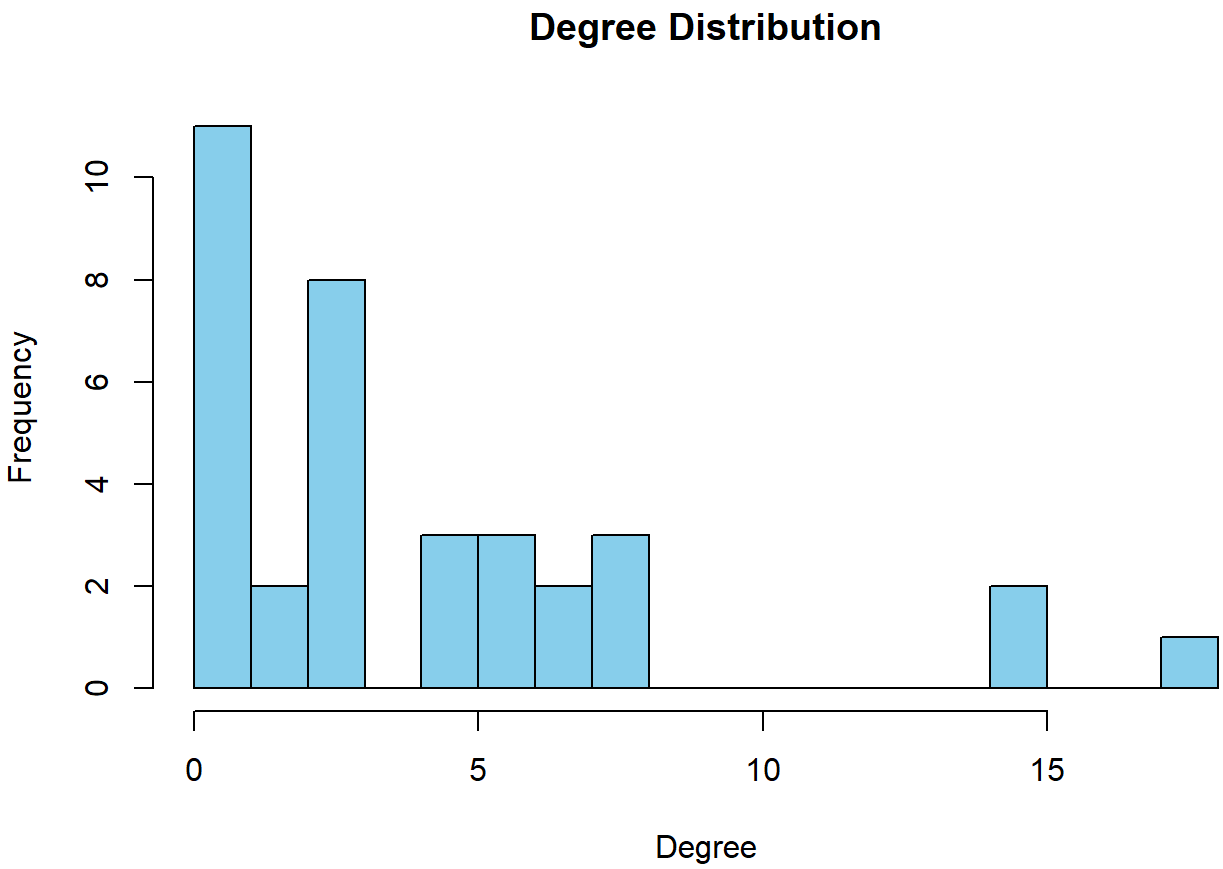
2. Node centrality

```
degree_centrality <- degree(net)
nodes_size <- 10 + 10 * degree_centrality / max(degree_centrality)
plot(net, layout = layout_nicely(net), vertex.size=nodes_size)
```



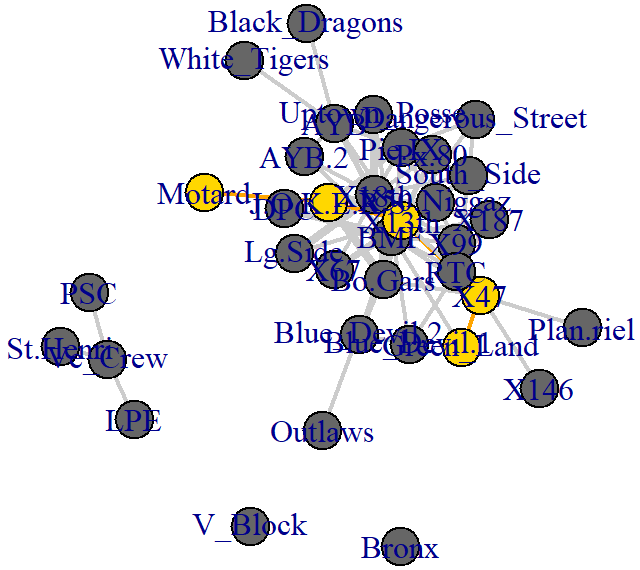
3. Degree distribution

```
degree_distr = degree_distribution(net)
hist(
  degree_centrality,
  breaks = 20,
  col = "skyblue",
  main = "Degree Distribution",
  xlab = "Degree",
  ylab = "Frequency"
)
```



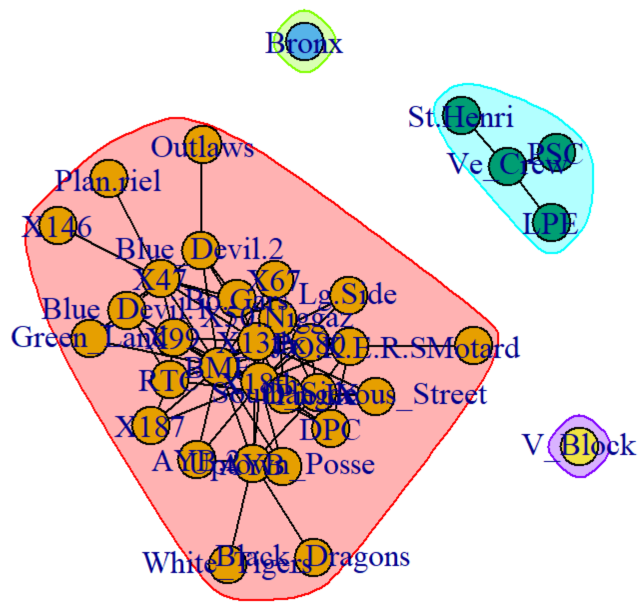
4. Longest path in net

```
diamenter_path = get_diameter(net)

ecol <- rep("gray80", ecount(net))
ecol[E(net, path=diamenter_path)] <- "orange"

ew <- rep(2, ecount(net))
ew[diamenter_path] <- 4

vcol <- rep("gray40", vcount(net))
vcol[diamenter_path] <- "gold"

plot(net,
   vertex.color=vcol,
   edge.color=ecol,
   edge.width=ew,
   edge.arrow.mode=0,
   layout = layout.fruchterman.reingold
)
```



5. Communities

```
clp <- cluster_label_prop(net)
plot(clp, net)
```


Bronx
St.Henri
Ve_Crew
PSC
LPE
Outlaws
Plan.riel
X146
Blue_Devil.2
X47
X67
Lg.Side
Blue_Devil.1
Green_Land
X99
Motard
RTC
Famous_Street
X187
DPC
Posse
V_Block
Black_Dragons