Exercise 01

2024-03-18

```r
linkedin_data <- read.csv("/Users/yuyichen/Desktop/Winter 2024/ORGB - 672/2024-ona-assig
nments/Connections_Yichen.csv")
```

```r
# 1. Count of contacts by current employer
employer_counts <- linkedin_data %>%
  group_by(Company) %>%
  summarise(Count = n())

# Print the counts
print(employer_counts)
```

```
## # A tibble: 160 × 2
##    Company           Count
##    <chr>             <int>
##  1 ""                    6
##  2 ".online business"    1
##  3 "5Y Capital"          1
##  4 "ADP"                 1
##  5 "ALDO Group"          2
##  6 "ALTEN"               1
##  7 "Acosta"              1
##  8 "Air Transat"         3
##  9 "Al Baladi Group"     1
## 10 "Allstate Canada"     1
## # ℹ 150 more rows
```

```r
# 2. Total count of contacts
total_contacts <- nrow(linkedin_data)
print(paste("Total contacts:", total_contacts))
```

```
## [1] "Total contacts: 226"
```

```r
# Ensure there is an 'id' column in linkedin_data which serves as a unique identifier
linkedin_data <- linkedin_data %>%
  mutate(id = row_number())

# Creating a new 'label' column with first name and the first letter of last name
linkedin_data <- linkedin_data %>%
  mutate(label = paste(First.Name, substr(Last.Name, 1, 1)))

# Create nodes dataframe
nodes <- linkedin_data %>%
  select(id, label)

# Creating edges DataFrame
# Ensure that we are only considering companies with more than one person
edges <- linkedin_data %>%
  group_by(Company) %>%
  filter(n() > 1) %>%
  do({
    ids <- .$id
    tibble(from = combn(ids, 2)[1, ], to = combn(ids, 2)[2, ])
  }) %>%
  ungroup() %>%
  select(from, to)

# Get the count of contacts by their current employer
count_by_company <- linkedin_data %>%
  count(Company)

# Total count of contacts
total_contacts <- nrow(linkedin_data)

# Output the counts
print(count_by_company)
```

```
##                                                                      Company
## 1
## 2                                                          .online business
## 3                                                                  5Y Capital
## 4                                                                         ADP
## 5                                                                  ALDO Group
## 6                                                                       ALTEN
## 7                                                                      Acosta
## 8                                                                 Air Transat
## 9                                                             Al Baladi Group
## 10                                                             Allstate Canada
## 11                                                 America Business Management
## 12                                            Ameriprise Financial Services, LLC
## 13                                                                 AtkinsRéalis
## 14                                               Atlantic Equipment Services
## 15                                                             Axioms Analytics
## 16                                             BC NEUROIMMUNOLOGY LABS INC
## 17                                                                         BDC
## 18                                                                 BNP Paribas
## 19                                                                  BOMBARDIER
## 20                                                                         BRP
## 21                                                 Battaglia Advisory Services
## 22                                                       Boehringer Ingelheim
## 23                                                             Boldyn Networks
## 24                                                                         CAE
## 25                                                                         CGI
## 26                                                                          CN
## 27                                                       Caitong Securities Ltd
## 28                                                   Canada Post / Postes Canada
## 29                                     Canada Revenue Agency – Agence du revenu du Canada
## 30                                                                       CapFi
## 31                                                                   Capgemini
## 32                                           Capitale Hélicoptère – École de pilotage
## 33                                               Ciatek IT & software solutions
## 34                                                                       Coach
## 35                                                           Compass Analytics
## 36                             Correctional Service Canada | Service correctionnel Canada
## 37                                         DINKAR FINANCIAL SERVICES PRIVATE LIMITED
## 38                                                         Dalhousie University
## 39                                                 Desautels Capital Management
## 40                                                       Design Group Staffing
## 41                                                                    DoorDash
## 42                                                         DoubleTree by Hilton
## 43                                                         Dress me collection
## 44                                                                          EY
## 45                                                                    Estartup
## 46                                                             FNCEC Financial
## 47                                             First Onsite Property Restoration
## 48                                                                      Fiverr
## 49                                                           Foresters Financial
## 50                                                          Futurism Enterprise
## 51                                                                  GDG Lahore
```

```
## 52                                                              GF Securities
## 53                                                                  GFX Prime
## 54                                                     Government of Nova Scotia
## 55                                                  Grant Thornton LLP (Canada)
## 56                                                 Grey Cardinal Management Inc.
## 57                                                   H2O ASIA CAPITAL PTE. LTD
## 58                                                                    HashNut
## 59                                                 Healthcare Systems R&A Inc.
## 60                                                            HeiD Enterprise
## 61                                                                        IDC
## 62                                                                IVADO LABS
## 63    Industrial Technology Research Institute (ITRI)（工業技術研究院，工研院）
## 64                                                                    Infosys
## 65                                                               J.P. Morgan
## 66                                                  Jarislowsky, Fraser Limited
## 67                                                     John Global Enterprise
## 68                                                       KPI Digital Solutions
## 69                                                               KPMG Canada
## 70                                                                   L'Oréal
## 71                                           LRDG Language Research Development Group
## 72                                                                   LemonBox
## 73                                                                     Lenovo
## 74                                                 Lifesaver Books and Seminars
## 75                                                      MHI RJ Aviation Group
## 76                                                                       MUFG
## 77                                                     MUFG Investor Services
## 78                                                            Marine Thinking
## 79                                                       Marsh Canada Limited
## 80                                                                    MassPay
## 81                                                            McGill University
## 82                            McGill University — Desautels Faculty of Management
## 83                                                           McKesson Canada
## 84                            Medexus Pharmaceuticals (TSX: MDP, OTCQX: MEDXF)
## 85                                              Mensana Change Management Ltd.
## 86                                                               Midas Safety
## 87                                                             Mile Solutions
## 88                                             Molson Coors Beverage Company
## 89                                                             Monster Energy
## 90                                                           Nallie Enterprise
## 91                                                    National Bank Financial
## 92    National Research Council Canada / Conseil national de recherches Canada
## 93                                                                     Nautel
## 94  New Silk Road Association of Germany (Neue Seidenstrasse  e. V. Deutschland
## 95                                                               NikahForever
## 96                                                      Northbridge Insurance
## 97                                                         Nova Scotia Power
## 98                 Ontario Government Ministry of Public and Business Service Delivery
## 99                                                            PSP Investments
## 100                                                                   Pandora
## 101                                                                 Pomellato
## 102                                                          Pratt & Whitney
## 103                                                   Pratt & Whitney Canada
```

```
## 104                                           Procter & Gamble
## 105                         Promising Maritime Training Company LTD.
## 106                          Property Valuation Services Corporation
## 107                                                             PwC
## 108                                                        QRA Corp
## 109                                       Queen's School of Computing
## 110                                                 Quinte Dimension
## 111                                                             RBC
## 112                                              RBC Capital Markets
## 113                                            RBC Investor Services
## 114                   RI-MUHC | Research Institute of the MUHC | #rimuhc
## 115                                            Royal LePage Atlantic
## 116                                          SHRIGLEY BATTRICK CPAs
## 117                                                             SLB
## 118                                              SavvyPro Edu Inc.
## 119                                                  Scotlynn Group
## 120                                                   Self-Employed
## 121                                                   Self-employed
## 122                                                       ShyftLabs
## 123                                                    Sia Partners
## 124                                            Siddiq Leather Works
## 125                                                    Solactive AG
## 126                               Strategic Arts Management (SAM)
## 127                                                        Sun Life
## 128                                                      Sunnybrook
## 129                                                   Sunwire Inc.
## 130                                                       Synechron
## 131                                                              TD
## 132                                                   TD Securities
## 133                                               Techcombank (TCB)
## 134                                                  Tesser Insights
## 135                                                The Data Mangrove
## 136                                   The Great Canadian Woman Inc.
## 137                                            The Pint Public House
## 138                                   Tibah Airports Operation Co. LTD
## 139                                             True North Accounting
## 140                                               University of Essex
## 141                   University of Warwick - Warwick Business School
## 142                                                       VNTodayInc
## 143                                      Veiva Scientific India Pvt Ltd
## 144                                                        VidCruiter
## 145                                                      ViraProcess
## 146                                                       VirtualDNA
## 147                                                 Volkswagen Group
## 148                                              WFG Securities Inc.
## 149                                   Waha Firdos Contracting LLC Dubai
## 150                                         http://www.cggthinktank.com
## 151                                                    iGan Partners
## 152                                      taiping life insurance co., LTD
## 153                                              École du Barreau
## 154                                                           复旦大学
## 155                                                         字节跳动
```

```
## 156                                                      工商银行珠海分行
## 157                                              杉数科技（北京）有限公司
## 158                                                          毕马威中国
## 159                                                        洲际酒店集团
## 160                                                                网易
##           n
## 1        6
## 2        1
## 3        1
## 4        1
## 5        2
## 6        1
## 7        1
## 8        3
## 9        1
## 10       1
## 11       1
## 12       1
## 13       3
## 14       1
## 15       1
## 16       1
## 17       3
## 18       3
## 19       2
## 20       2
## 21       1
## 22       1
## 23       1
## 24       2
## 25       1
## 26       5
## 27       1
## 28       1
## 29       1
## 30       1
## 31       1
## 32       1
## 33       1
## 34       1
## 35       2
## 36       1
## 37       1
## 38       2
## 39       3
## 40       1
## 41       1
## 42       1
## 43       1
## 44       4
## 45       1
## 46       1
```

```
## 47    1
## 48    1
## 49    2
## 50    1
## 51    1
## 52    1
## 53    1
## 54    1
## 55    1
## 56    1
## 57    1
## 58    1
## 59    1
## 60    1
## 61    1
## 62    1
## 63    1
## 64    1
## 65    1
## 66    1
## 67    1
## 68    3
## 69    1
## 70    4
## 71    1
## 72    1
## 73    1
## 74    1
## 75    1
## 76    4
## 77    6
## 78    1
## 79    1
## 80    1
## 81   10
## 82    9
## 83    2
## 84    1
## 85    1
## 86    1
## 87    1
## 88    1
## 89    1
## 90    1
## 91    1
## 92    1
## 93    1
## 94    1
## 95    1
## 96    1
## 97    1
## 98    1
```

```
## 99    1
## 100   1
## 101   1
## 102   1
## 103   3
## 104   1
## 105   1
## 106   1
## 107   1
## 108   1
## 109   1
## 110   1
## 111   1
## 112   1
## 113   1
## 114   1
## 115   1
## 116   1
## 117   1
## 118   1
## 119   1
## 120   1
## 121   2
## 122   1
## 123   1
## 124   1
## 125   1
## 126   1
## 127   1
## 128   1
## 129   1
## 130   1
## 131   2
## 132   2
## 133   1
## 134   1
## 135   2
## 136   1
## 137   1
## 138   1
## 139   1
## 140   1
## 141   1
## 142   1
## 143   1
## 144   1
## 145   1
## 146   1
## 147   1
## 148   1
## 149   1
## 150   1
```

```
## 151  1
## 152  1
## 153  1
## 154  1
## 155  1
## 156  1
## 157  1
## 158  1
## 159  1
## 160  1
```

```
print(total_contacts)
```

```
## [1] 226
```

```r
# Create a tidygraph object
network <- tbl_graph(nodes = nodes, edges = edges)

# Convert to igraph object
g <- graph_from_data_frame(d = edges, vertices = nodes, directed = FALSE)

# Plot the network using ggraph
ggraph(g, layout = 'fr') +
  geom_edge_link() +
  geom_node_point(color = 'blue', size = 5) +
  geom_node_text(aes(label = label), repel = TRUE,
                 point.padding = unit(0.2, "lines"),
                 fontface = "plain", family = "") + # Ensure default font settings
  theme_graph() +
  ggtitle("LinkedIn Network Graph")
```

```
## Warning: ggrepel: 80 unlabeled data points (too many overlaps). Consider
## increasing max.overlaps
```

LinkedIn Network Graph