Homework-1-Group-19

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Homework group - 19 (Abhinav, Mukul, Vijay)

Data and project setup

- Installing styler to maintain code consistency

```
# install.packages("styler")
```

- Loading libraries

```
# Loading the required libraries

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(stringr)
library(readr)
```

- Reading all datasets, and storing them into data frames

```
# Dataframe variables
df_fm <- read.csv("fm.csv")
df_wine <- read.csv("wine_data.csv")
df_keywords <- read_csv("keyword_data.csv")
```

```
## Rows: 66 Columns: 13
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (13): Title, Keyword 1, Keyword 2, Keyword 3, Keyword 4, Keyword 5, Keyw...

##
## 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.
```

```
# Dimension variables
dim_farmers_market <- dim(df_fm)
dim_wine <- dim(df_wine)
dim_keywords <- dim(df_keywords)

# Number of records / dimensions for observations
print(paste("The dimensions for the farmers market dataset are:", dim_farmers_market[1], dim_farmers_ma
```

```
## [1] "The dimensions for the farmers market dataset are: 8801 59"
```

```
print(paste("The dimensions for the wines dataset are:", dim_wine[1], dim_wine[2]))
```

```
## [1] "The dimensions for the wines dataset are: 150930 11"
```

```
print(paste("The dimensions for the keyword dataset are:", dim_keywords[1], dim_keywords[2]))
```

```
## [1] "The dimensions for the keyword dataset are: 66 13"
```

1. Questions on farmers market dataset

1.1 Compute the number of farmers market in the United States

```
# Naively, Taking number of unique market names can be taken as an assumption, and taken of as the answ
unq_markets <- unique(df_fm$MarketName)

# However this gives the answer as [1] 8243 and the observations are 8801
incorrect_ans <- length(unq_markets)

# On further inspection of the data, some of the different states have the same name of markets.

# Method 1 -> Using FMID as primary key

# Since Farmers market names are not unique, we can calculate number of unique FMID.
num_unq_markets <- length(unique(df_fm$FMID))

print(paste("The number of unique farmer markets based on FMID:", num_unq_markets))
```

```
## [1] "The number of unique farmer markets based on FMID: 8801"
```

```r
# Method 2 -> Generating our own primary key
# In case we didn't have a primary key in the dataset, we can generate our own.

# To do the same, we add a new identifier UNQ_ID, which is the combination of the Market Name, City , C
df_fm$UNQ_ID <- paste(trimws(df_fm$MarketName), trimws(df_fm$city), trimws(df_fm$County), trimws(df_fm$

num_unq_markets_2 <- length(df_fm$UNQ_ID)

print(paste("The number of unique farmer markets based on combination of Name, City, County and State a
```

```
## [1] "The number of unique farmer markets based on combination of Name, City, County and State are:  8
```

1.2 Write a code to compute the number of farmers markets by state and arrange them in descending order of number of farmers market.

- Method 1 <- Subsetting all states within fm dataset by using list of unique state

```r
## Create a vector containing state names
list_of_states <- unique(df_fm$State)

## Initialize a vector having length equal to number of state
count_of_markets <- 1:length(list_of_states)

## Apply a for loop to iterate over every state name
for (i in 1:length(list_of_states)) {
  ## Find the number of markets in a state and store in a variable
  count_of_markets_in_state <- dim(subset(df_fm, df_fm$State == list_of_states[i]))[1]
  ## Store the value of variable at the same index as of state
  count_of_markets[i] <- count_of_markets_in_state
}

## Create a new data frame where the column values would be 2 vectors created above
temp_df <- data.frame("State" = list_of_states, "Count_Of_Market" = count_of_markets)

## sort the dataframe on number of markets
fm_by_states_one <- temp_df[order(temp_df$Count_Of_Market, decreasing = TRUE), ]

fm_by_states_one
```

```
##                  State Count_Of_Market
## 37          California             760
## 5             New York             673
## 34            Michigan             343
## 2                 Ohio             341
## 14            Illinois             338
## 28       Massachusetts             327
## 26           Wisconsin             312
## 12        Pennsylvania             311
## 15             Florida             264
## 11            Virginia             263
## 4             Missouri             256
## 38      North Carolina             254
```

```
## 40                Texas            236
## 25                 Iowa            227
## 10            Minnesota            200
## 21              Indiana            200
## 16           Washington            175
## 32              Georgia            169
## 20             Maryland            165
## 23             Colorado            161
## 9                Oregon            159
## 49          Connecticut            158
## 18           New Jersey            156
## 24              Alabama            140
## 35             Kentucky            139
## 3        South Carolina            133
## 6             Tennessee            133
## 17               Kansas            121
## 48             Arkansas            111
## 13             Nebraska            104
## 31                Maine             96
## 36                Hawaii            96
## 51        New Hampshire             96
## 41        West Virginia             94
## 39              Arizona             93
## 1                Vermont             92
## 50          Mississippi             83
## 29            Louisiana             81
## 33             Oklahoma             74
## 30           New Mexico             72
## 43              Montana             72
## 42                Idaho             66
## 44         North Dakota             66
## 8  District of Columbia             60
## 52               Wyoming             50
## 19                  Utah             46
## 53          Puerto Rico             42
## 27         South Dakota             41
## 22               Nevada             38
## 45               Alaska             37
## 47         Rhode Island             37
## 7              Delaware             36
## 46       Virgin Islands              4
```

- Method 2 <- Iterating over every unique state and farmers market data

```r
# Make a blank dataframe with unique states and count initialized as 0
fm_by_states_two <- data.frame(State = unique(df_fm$State), cnt = c(0))


# Looping over unique states
for (i in 1:dim(fm_by_states_two)[1]) {
  # Looping over all farmer markets data
  for (j in 1:dim(df_fm)[1]) {
    # If a match is encountered with current state, increase count by 1
    if (fm_by_states_two[i, "State"] == df_fm[j, "State"]) {
```

```
      fm_by_states_two[i, "cnt"] <- fm_by_states_two[i, "cnt"] + 1
    }
  }
}

# Sort the dataframe
fm_by_states_two <- fm_by_states_two[order(fm_by_states_two$cnt, decreasing = T), ]

fm_by_states_two
```

```
##                  State cnt
## 37          California 760
## 5             New York 673
## 34            Michigan 343
## 2                 Ohio 341
## 14            Illinois 338
## 28       Massachusetts 327
## 26           Wisconsin 312
## 12        Pennsylvania 311
## 15             Florida 264
## 11            Virginia 263
## 4             Missouri 256
## 38      North Carolina 254
## 40               Texas 236
## 25                Iowa 227
## 10           Minnesota 200
## 21             Indiana 200
## 16          Washington 175
## 32             Georgia 169
## 20            Maryland 165
## 23            Colorado 161
## 9               Oregon 159
## 49         Connecticut 158
## 18          New Jersey 156
## 24             Alabama 140
## 35            Kentucky 139
## 3       South Carolina 133
## 6            Tennessee 133
## 17              Kansas 121
## 48            Arkansas 111
## 13            Nebraska 104
## 31               Maine  96
## 36              Hawaii  96
## 51       New Hampshire  96
## 41       West Virginia  94
## 39             Arizona  93
## 1              Vermont  92
## 50         Mississippi  83
## 29           Louisiana  81
## 33            Oklahoma  74
## 30          New Mexico  72
## 43             Montana  72
## 42               Idaho  66
```

```
## 44         North Dakota  66
## 8  District of Columbia  60
## 52              Wyoming  50
## 19                 Utah  46
## 53          Puerto Rico  42
## 27         South Dakota  41
## 22               Nevada  38
## 45               Alaska  37
## 47         Rhode Island  37
## 7              Delaware  36
## 46       Virgin Islands   4
```

- Method 3 -> Using DPLYR

```
# Dplyr has in built functions which can help do the same with a few lines of code

fm_by_states_three <- group_by(df_fm, State) %>%
  summarize(cnt = n()) %>%
  arrange(desc(cnt), .by_group = T)

fm_by_states_three
```

```
## # A tibble: 53 x 2
##    State           cnt
##    <chr>         <int>
##  1 California      760
##  2 New York        673
##  3 Michigan        343
##  4 Ohio            341
##  5 Illinois        338
##  6 Massachusetts   327
##  7 Wisconsin       312
##  8 Pennsylvania    311
##  9 Florida         264
## 10 Virginia        263
## # ... with 43 more rows
```

1.3 Write a code to compute the number of farmers market by cities in Massachusetts and display the top five cities

- Method 1 <- Iterating over all farmer markets data and adding data where city matches

```
# Making a copy of the dataframe, to avoid data iconsistency issues
df_fm_ma <- df_fm

# Creating an empty data frame with City and count as columns
df_fm_MA_City <- data.frame(City = character(), count = as.numeric())

# Removing empty values from the dataframe
df_fm_ma <- subset(df_fm_ma, df_fm_ma$city != "")

# String manipulation to ensure consistent name of cities
```

```r
# Removing trailing / leading whitespace
df_fm_ma$city <- trimws(df_fm_ma$city)

# Converting city to lower case
df_fm_ma$city <- tolower(df_fm_ma$city)

# Iterating over farmers market dataset
for (i in 1:dim(df_fm_ma)[1]) {
  # If state matches Massachusetts
  if (df_fm_ma[i, "State"] == "Massachusetts") {
    # Current city
    current_city <- df_fm_ma[i, "city"]
    # Check if any city matches current city
    if (any(df_fm_MA_City$City == current_city)) {
      # Index where the city matches
      city_index <- which(df_fm_MA_City$City == current_city)
      # Increment count of city by 1
      df_fm_MA_City[city_index, "count"] <- as.numeric(df_fm_MA_City[city_index, "count"]) + as.numeric
    } else {
      # If city doesn't exist initialize it by 1
      df_fm_MA_City[nrow(df_fm_MA_City) + 1, ] <- c(current_city, as.numeric(1))
    }
  }
}

# Convert count to numeric
df_fm_MA_City$count <- as.numeric(df_fm_MA_City$count)

# Sort the values
answer_one <- df_fm_MA_City[order(df_fm_MA_City$count, decreasing = T), ]

# Answer is the top 5 values
answer_one <- head(answer_one, 5)

answer_one
```

```
##            City count
## 31    worcester    24
## 6        boston    10
## 15   dorchester     7
## 41    cambridge     6
## 141 new bedford     6
```

- Method 2 <- Using subset to match cities while iterating

```r
## Filter data on MA state
ma_state <- subset(df_fm, df_fm$State == "Massachusetts")

## Trimming the extra spaces and lowercase the column 'city'
ma_state$city <- trimws(ma_state$city)
ma_state$city <- str_to_lower(ma_state$city)

## Drop rows where city is null
```

```
ma_state <- ma_state[!is.na(ma_state$city), ]

## Create a vector containing the name of cities
list_of_cities <- unique(ma_state$city)
## Create a vector having length equal to the number of cities
count_of_markets <- 1:length(list_of_cities)

## Iterate over name of cities
for (i in 1:length(list_of_cities)) {
  ## Find the number of markets in a city and store in a variable
  count_of_markets_in_city <- dim(subset(ma_state, ma_state$city == list_of_cities[i]))[1]
  ## Store the value of variable at the same index as of city
  count_of_markets[i] <- count_of_markets_in_city
}

## Create a new data frame where the column values would be 2 vectors created above
df <- data.frame("City" = list_of_cities, "Count_Of_Market" = count_of_markets)

df <- df[order(df$Count_Of_Market, decreasing = TRUE), ]

# Showing the answer
head(df, 5)
```

```
##            City Count_Of_Market
## 31    worcester              24
## 6        boston              10
## 15   dorchester               7
## 41    cambridge               6
## 142 new bedford               6
```

1.4 - Write a code to show the top 5 states by number of farmers market that offers coffee

```
## Filter out farmers who offer coffee
coffee_df <- df_fm %>%
  filter(Coffee == "Y")

## String manipulations to ensure consistency
coffee_df$city <- trimws(coffee_df$city)
coffee_df$city <- str_to_lower(coffee_df$city)

## Group on State name and take the count of number of farmers market to get the result
answer <- coffee_df %>%
  group_by(State) %>%
  summarise(Number_of_Markets = n())

## Sort the results on number of farmers market
answer <- answer[order(answer$Number_of_Markets, decreasing = TRUE), ]
head(answer, 5)
```

```
## # A tibble: 5 x 2
##   State         Number_of_Markets
##   <chr>                     <int>
```

```
## 1 California                  168
## 2 New York                    120
## 3 Massachusetts               103
## 4 Illinois                     98
## 5 Ohio                         91
```

2. Questions on wine dataset

2.1 Use the "designation" variable and calculate the number of 20 year old wine in the dataset

- Method 1 -> Using regex with grep / str_which

```
# There is some confusion whether "anniversary" keyword should be considered in the dataset as wine age

## Lowercase all the designation for uniformity and reduce redundancy
df_wine$designation <- str_to_lower(df_wine$designation)

# Answer WITHOUT considering anniversary (using grep)
wine_twenty_without_anniversary <- df_wine[grep("(20 |20-|20th|20- )( )?(Y+|y+|Anos|anos|anni )", df_wi

# Answer WITH anniversary (using str_which)
wine_twenty_with_anniversary <- df_wine[str_which(df_wine$designation, "(20 |20-|20th)( )?(Y+|y+|Annive

# According to our observation of data, 20th Anniversary wine does NOT necessarily mean a 20 year old w

print(paste("There are ", dim(wine_twenty_with_anniversary)[1], "wines if we consider 'anniversary' key
```

```
## [1] "There are  87 wines if we consider 'anniversary' keyword as wine age."
```

```
print(paste("There are ", dim(wine_twenty_without_anniversary)[1], "wines without considering 'anniversa
```

```
## [1] "There are  83 wines without considering 'anniversary' keyword as wine age."
```

- Method 2 <- Using list of possible 20 year old wines to filter data

```
## This result is producing 85 results which includes 'Anniversary' keyword as well

## Lowercase all the designation for uniformity and reduce redundancy
df_wine$designation <- str_to_lower(df_wine$designation)

## Create a vector of possible strings
string_list <- c("20 years", "20 year", "20 yrs", "20 yr", "20 anos", "20_years", "20_year", "20_yrs",
temp_df <- data.frame()

## Iterate over all the possible strings and get rows after partial match
for (i in string_list) {
  index <- str_which(df_wine$designation, i)
  answer <- df_wine[index, ]
  temp_df <- rbind(temp_df, answer)
}
## Drop duplicate rows (if any)
```

```r
final_df <- temp_df[!duplicated(temp_df), ]

print(paste("There are ", dim(final_df)[1], "wines if we consider 'anniversary' keyword as wine age."))
```

```
## [1] "There are  87 wines if we consider 'anniversary' keyword as wine age."
```

3.1 Write an R code to extract keyword data from the above file and convert it to a weighted adjacency matrix. See the figure below to understand the process

- Method 1

```r
## drop rows with null keywords
df_keywords1 <- df_keywords[!is.na(df_keywords$`Keyword 1`), ]
temp <- c()

## iterate over the keyword dataframe, pick each keyword and append it into the vector
for (i in 1:dim(df_keywords1)[1]) {
  for (j in 2:dim(df_keywords1)[2]) {
    if (!is.na(df_keywords1[[i, j]])) {
      temp <- c(temp, tolower(df_keywords1[[i, j]]))
    }
  }
}
## Drop duplicates from vector
temp <- unique(temp)

## Create a matrix with dimension equal to length of number of unique keywords
adjacency_matrix <- matrix(0, nrow = length(temp), ncol = length(temp))

## Rename column and row names as the keywords
rownames(adjacency_matrix) <- c(temp)
colnames(adjacency_matrix) <- c(temp)

## Iterate over keyword dataframe and increment values in the empty matrix
n_rows <- dim(df_keywords1)[1]
for (x in 1:n_rows) {
  for (i in 2:length(df_keywords1)) {
    for (j in 2:length(df_keywords1)) {

      ## Find keyword 1 and keyword 2
      key1 <- tolower(df_keywords1[[x, i]])
      key2 <- tolower(df_keywords1[[x, j]])

      ## Key1 should not be equal to Key2 and either of them should not be null
      if ((!is.na(key1)) && (!is.na(key2)) && (key1 != key2)) {
        adjacency_matrix[key1, key2] <- adjacency_matrix[key1, key2] + 1
      }
    }
  }
}

print("The dataframe is below:")
```

```
## [1] "The dataframe is below:"
```

```
adjacency_df <- data.frame(adjacency_matrix)

head(adjacency_df,5)
```

```
##                          equity organizational.sociology performance
## equity                        0                        1           1
## organizational sociology      1                        0           2
## performance                   1                        2           0
## meta-analysis                 1                        1           1
## psychometrics                 1                        1           1
##                          meta.analysis psychometrics organizational.research
## equity                               1             1                       1
## organizational sociology             1             1                       2
## performance                          1             1                       1
## meta-analysis                        0             1                       1
## psychometrics                        1             0                       1
##                          financial.performance agency.theory
## equity                                       1             1
## organizational sociology                     1             3
## performance                                  1             1
## meta-analysis                                1             1
## psychometrics                                1             1
##                          organizational.effectiveness organizational.behavior
## equity                                              1                       1
## organizational sociology                            4                       6
## performance                                         3                       2
## meta-analysis                                       1                       1
## psychometrics                                       1                       1
##                          corporate.governance diversification.in.industry
## equity                                      1                           0
## organizational sociology                    1                           0
## performance                                 2                           0
## meta-analysis                               1                           0
## psychometrics                               1                           0
##                          business.planning performance.standards
## equity                                   0                     0
## organizational sociology                 0                     0
## performance                              0                     0
## meta-analysis                            0                     0
## psychometrics                            0                     0
##                          employees....rating.of corporate.culture
## equity                                       0                 0
## organizational sociology                     0                 0
## performance                                  0                 0
## meta-analysis                                0                 0
## psychometrics                                0                 0
##                          strategic.planning management.science
## equity                                    0                  0
## organizational sociology                  0                  2
## performance                               0                  0
## meta-analysis                             0                  0
## psychometrics                             0                  0
```

```
##                          management.research product.management
## equity                                     0                   0
## organizational sociology                   0                   0
## performance                                0                   0
## meta-analysis                              0                   0
## psychometrics                              0                   0
##                          interorganizational.relations intergroup.relations
## equity                                               0                    0
## organizational sociology                             1                    0
## performance                                          0                    0
## meta-analysis                                        0                    0
## psychometrics                                        0                    0
##                          business.communication investments supply.chains
## equity                                        0           0             0
## organizational sociology                      0           1             0
## performance                                   0           0             0
## meta-analysis                                 0           0             0
## psychometrics                                 0           0             0
##                          knowledge.management interorganizational.networks
## equity                                      0                            0
## organizational sociology                    0                            1
## performance                                 0                            0
## meta-analysis                               0                            0
## psychometrics                               0                            0
##                          group.decision.making intellectual.capital
## equity                                       0                   0
## organizational sociology                     1                   0
## performance                                  1                   0
## meta-analysis                                0                   0
## psychometrics                                0                   0
##                          executive.compensation wages human.capital
## equity                                        0     0             0
## organizational sociology                      0     0             0
## performance                                   0     0             0
## meta-analysis                                 0     0             0
## psychometrics                                 0     0             0
##                          labor.economics personnel.management
## equity                                 0                    0
## organizational sociology               0                    4
## performance                            0                    1
## meta-analysis                          0                    0
## psychometrics                          0                    0
##                          contingency.theory..management.
## equity                                                 0
## organizational sociology                               0
## performance                                            0
## meta-analysis                                          0
## psychometrics                                          0
##                          compensation.management executive.ability..management.
## equity                                         0                              0
## organizational sociology                       0                              0
## performance                                    0                              0
## meta-analysis                                  0                              0
## psychometrics                                  0                              0
```

```
##                          information.resources.management
## equity                                                   0
## organizational sociology                                 0
## performance                                              0
## meta-analysis                                            0
## psychometrics                                            0
##                          management.information.systems break.even.analysis
## equity                                                 0                   0
## organizational sociology                               0                   0
## performance                                            0                   0
## meta-analysis                                          0                   0
## psychometrics                                          0                   0
##                          data.mining research...development
## equity                             0                       0
## organizational sociology           0                       1
## performance                        0                       0
## meta-analysis                      0                       0
## psychometrics                      0                       0
##                          research...development.contracts decision.making
## equity                                                   0               0
## organizational sociology                                 0               0
## performance                                              0               0
## meta-analysis                                            0               0
## psychometrics                                            0               0
##                          transaction.costs emotions..psychology.
## equity                                   0                     0
## organizational sociology                 0                     0
## performance                              0                     0
## meta-analysis                            0                     0
## psychometrics                            0                     0
##                          interpersonal.relations stress..psychology.
## equity                                         0                   0
## organizational sociology                       1                   0
## performance                                    0                   0
## meta-analysis                                  0                   0
## psychometrics                                  0                   0
##                          social.interaction social.psychology
## equity                                    0                 0
## organizational sociology                  0                 1
## performance                               0                 0
## meta-analysis                             0                 0
## psychometrics                             0                 0
##                          employees....attitudes customer.services
## equity                                         0                 0
## organizational sociology                       0                 0
## performance                                    0                 0
## meta-analysis                                  0                 0
## psychometrics                                  0                 0
##                          customer.satisfaction job.stress
## equity                                       0          0
## organizational sociology                     0          0
## performance                                  0          0
## meta-analysis                                0          0
## psychometrics                                0          0
```

```
##                          peer.review..professional.performance. supervisors
## equity                                                        0           0
## organizational sociology                                      0           0
## performance                                                   0           0
## meta-analysis                                                 0           0
## psychometrics                                                 0           0
##                          justice conflict.management mediation employees
## equity                         0                   0         0         0
## organizational sociology       0                   0         0         0
## performance                    0                   0         0         0
## meta-analysis                  0                   0         0         0
## psychometrics                  0                   0         0         0
##                          industrial.relations united.states....national.guard
## equity                                      0                                0
## organizational sociology                    1                                0
## performance                                 0                                0
## meta-analysis                               0                                0
## psychometrics                               0                                0
##                          resource.allocation decision.theory
## equity                                     0              0
## organizational sociology                   0              1
## performance                                0              0
## meta-analysis                              0              0
## psychometrics                              0              0
##                          punctuated.equilibrium..evolution.
## equity                                                    0
## organizational sociology                                  1
## performance                                               0
## meta-analysis                                             0
## psychometrics                                             0
##                          organizational.change organizational.structure
## equity                                       0                        0
## organizational sociology                     2                        4
## performance                                  0                        2
## meta-analysis                                0                        0
## psychometrics                                0                        0
##                          business.models executives industrial.management
## equity                                 0          0                     0
## organizational sociology               1          0                     2
## performance                            0          0                     0
## meta-analysis                          0          0                     0
## psychometrics                          0          0                     0
##                          new.products high.technology.industries
## equity                              0                         0
## organizational sociology            0                         0
## performance                         0                         0
## meta-analysis                       0                         0
## psychometrics                       0                         0
##                          stockholders.wealth institutional.investors
## equity                                     0                       0
## organizational sociology                   0                       0
## performance                                0                       0
## meta-analysis                              0                       0
## psychometrics                              0                       0
```

```
##                          decentralization.in.management stock.repurchasing
## equity                                                0                 0
## organizational sociology                              0                 0
## performance                                           0                 0
## meta-analysis                                         0                 0
## psychometrics                                         0                 0
##                          corporations....finance incentives.in.industry
## equity                                         0                      0
## organizational sociology                       0                      2
## performance                                    0                      0
## meta-analysis                                  0                      0
## psychometrics                                  0                      0
##                          family.owned.business.enterprises debt
## equity                                                   0    0
## organizational sociology                                 0    0
## performance                                              0    0
## meta-analysis                                            0    0
## psychometrics                                            0    0
##                          directors.of.corporations employee.ownership
## equity                                           0                 0
## organizational sociology                         0                 0
## performance                                      0                 0
## meta-analysis                                    0                 0
## psychometrics                                    0                 0
##                          boards.of.directors globalization
## equity                                     0             0
## organizational sociology                   0             0
## performance                                0             0
## meta-analysis                              0             0
## psychometrics                              0             0
##                          international.business.enterprises foreign.investments
## equity                                                    0                   0
## organizational sociology                                  0                   0
## performance                                               0                   0
## meta-analysis                                             0                   0
## psychometrics                                             0                   0
##                          pension.trusts high.technology
## equity                                0               0
## organizational sociology              0               0
## performance                           0               0
## meta-analysis                         0               0
## psychometrics                         0               0
##                          technological.innovations innovation.adoption property
## equity                                           0                   0        0
## organizational sociology                         0                   0        1
## performance                                      0                   0        1
## meta-analysis                                    0                   0        0
## psychometrics                                    0                   0        0
##                          stewards chief.executive.officers business.enterprises
## equity                          0                        0                    0
## organizational sociology        1                        0                    0
## performance                     0                        0                    0
## meta-analysis                   0                        0                    0
## psychometrics                   0                        0                    0
```

```
##                          risk municipal.corporations stockholders profit
## equity                      0                      0            0      0
## organizational sociology    0                      0            0      0
## performance                 0                      0            1      1
## meta-analysis               0                      0            0      0
## psychometrics               0                      0            0      0
##                          minority.stockholders eminent.domain stock.options
## equity                                       0              0             0
## organizational sociology                     0              0             0
## performance                                  1              1             0
## meta-analysis                                0              0             0
## psychometrics                                0              0             0
##                          stocks..finance. stock.ownership
## equity                                  0               0
## organizational sociology                0               0
## performance                             0               0
## meta-analysis                           0               0
## psychometrics                           0               0
##                          employee.stock.options risk.management.in.business
## equity                                        0                           0
## organizational sociology                      0                           0
## performance                                   0                           0
## meta-analysis                                 0                           0
## psychometrics                                 0                           0
##                          screenwriters creative.ability
## equity                               0                0
## organizational sociology             0                0
## performance                          0                0
## meta-analysis                        0                0
## psychometrics                        0                0
##                          creative.ability.in.business
## equity                                              0
## organizational sociology                            0
## performance                                         0
## meta-analysis                                       0
## psychometrics                                       0
##                          social.judgment.theory..communication.
## equity                                                       0
## organizational sociology                                     0
## performance                                                  0
## meta-analysis                                                0
## psychometrics                                                0
##                          motion.picture.authorship self.perception
## equity                                           0               0
## organizational sociology                         0               0
## performance                                      0               0
## meta-analysis                                    0               0
## psychometrics                                    0               0
##                          quality.of.products industrial.organization
## equity                                     0                       0
## organizational sociology                   0                       1
## performance                                0                       0
## meta-analysis                              0                       0
## psychometrics                              0                       0
```

```
##                          business.networks suppliers
## equity                                   0         0
## organizational sociology                 1         0
## performance                              0         0
## meta-analysis                            0         0
## psychometrics                            0         0
##                          strategic.alliances..business. aggression..psychology.
## equity                                                0                       0
## organizational sociology                              0                       0
## performance                                           0                       0
## meta-analysis                                         0                       0
## psychometrics                                         0                       0
##                          violence organizational.justice work.environment
## equity                          0                      0                0
## organizational sociology        0                      0                1
## performance                     0                      0                0
## meta-analysis                   0                      0                0
## psychometrics                   0                      0                0
##                          violence.in.the.workplace anger.in.the.workplace
## equity                                           0                      0
## organizational sociology                         0                      0
## performance                                      0                      0
## meta-analysis                                    0                      0
## psychometrics                                    0                      0
##                          problem.employees work.attitudes personnel.changes
## equity                                   0              0                 0
## organizational sociology                 0              0                 1
## performance                              0              0                 0
## meta-analysis                            0              0                 0
## psychometrics                            0              0                 0
##                          succession.planning executive.succession
## equity                                     0                    0
## organizational sociology                   0                    0
## performance                                0                    0
## meta-analysis                              0                    0
## psychometrics                              0                    0
##                          executives....recruiting job.qualifications
## equity                                          0                  0
## organizational sociology                        2                  0
## performance                                     0                  0
## meta-analysis                                   0                  0
## psychometrics                                   0                  0
##                          mental.fatigue industrial.psychology
## equity                                0                     0
## organizational sociology              0                     2
## performance                           0                     0
## meta-analysis                         0                     0
## psychometrics                         0                     0
##                          burnout..psychology. social.networks
## equity                                      0               0
## organizational sociology                    0               0
## performance                                 0               0
## meta-analysis                               0               0
## psychometrics                               0               0
```

```
##                          motivation..psychology. intrinsic.motivation
## equity                                         0                    0
## organizational sociology                       0                    0
## performance                                    0                    0
## meta-analysis                                  0                    0
## psychometrics                                  0                    0
##                          contagion..social.psychology. teams.in.the.workplace
## equity                                               0                      0
## organizational sociology                             1                      5
## performance                                          0                      1
## meta-analysis                                        0                      0
## psychometrics                                        0                      0
##                          employee.recruitment problem.solving
## equity                                      0               0
## organizational sociology                    1               0
## performance                                 0               0
## meta-analysis                               0               0
## psychometrics                               0               0
##                          marketing.management product.design product.lines
## equity                                      0              0             0
## organizational sociology                    1              0             0
## performance                                 0              0             0
## meta-analysis                               0              0             0
## psychometrics                               0              0             0
##                          product.information.management
## equity                                                0
## organizational sociology                              0
## performance                                           0
## meta-analysis                                         0
## psychometrics                                         0
##                          social.capital..sociology. infrastructure..economics.
## equity                                           0                          0
## organizational sociology                         0                          0
## performance                                      0                          0
## meta-analysis                                    0                          0
## psychometrics                                    0                          0
##                          venture.capital going.public..securities.
## equity                                 0                         0
## organizational sociology               0                         0
## performance                            0                         0
## meta-analysis                          0                         0
## psychometrics                          0                         0
##                          competitive.advantage entrepreneurship capital.market
## equity                                       0                0              0
## organizational sociology                     1                0              0
## performance                                  1                0              0
## meta-analysis                                0                0              0
## psychometrics                                0                0              0
##                          resource.management multilevel.marketing
## equity                                     0                    0
## organizational sociology                   0                    1
## performance                                0                    0
## meta-analysis                              0                    0
## psychometrics                              0                    0
```

```
##                          organizational.commitment quality.of.work.life
## equity                                           0                    0
## organizational sociology                         1                    1
## performance                                      0                    0
## meta-analysis                                    0                    0
## psychometrics                                    0                    0
##                          job.satisfaction ambivalence performance.evaluation
## equity                                  0           0                      0
## organizational sociology                1           1                      0
## performance                             0           0                      0
## meta-analysis                           0           0                      0
## psychometrics                           0           0                      0
##                          commercial.products marketing
## equity                                     0         0
## organizational sociology                   0         0
## performance                                0         0
## meta-analysis                              0         0
## psychometrics                              0         0
##                          marketing....decision.making leadership
## equity                                              0          0
## organizational sociology                            0          1
## performance                                         0          0
## meta-analysis                                       0          0
## psychometrics                                       0          0
##                          self.management..psychology.
## equity                                              0
## organizational sociology                            0
## performance                                         0
## meta-analysis                                       0
## psychometrics                                       0
##                          management....employee.participation
## equity                                                      0
## organizational sociology                                    0
## performance                                                 0
## meta-analysis                                               0
## psychometrics                                               0
##                          critical.incident.technique task.analysis
## equity                                             0             0
## organizational sociology                           0             0
## performance                                        0             0
## meta-analysis                                      0             0
## psychometrics                                      0             0
##                          critical.thinking workflow management
## equity                                  0        0          0
## organizational sociology                0        0          2
## performance                             0        0          1
## meta-analysis                           0        0          0
## psychometrics                           0        0          0
##                          delegation.of.authority strategic.business.units
## equity                                         0                       0
## organizational sociology                       0                       0
## performance                                    0                       0
## meta-analysis                                  0                       0
## psychometrics                                  0                       0
```

```
##                          labor.supply labor.organizing conduct.of.life
## equity                              0                0              0
## organizational sociology            0                0              0
## performance                         0                0              0
## meta-analysis                       0                0              0
## psychometrics                       0                0              0
##                          employee.loyalty social.influence
## equity                                  0                0
## organizational sociology                0                0
## performance                             0                0
## meta-analysis                           0                0
## psychometrics                           0                0
##                          individual.differences social.context work...family
## equity                                        0              0             0
## organizational sociology                      0              0             0
## performance                                   0              0             0
## meta-analysis                                 0              0             0
## psychometrics                                 0              0             0
##                          women.employees stocks..finance.....prices
## equity                                 0                          0
## organizational sociology               0                          0
## performance                            0                          0
## meta-analysis                          0                          0
## psychometrics                          0                          0
##                          human.resource.accounting women....employment
## equity                                           0                   0
## organizational sociology                         0                   0
## performance                                      0                   0
## meta-analysis                                    0                   0
## psychometrics                                    0                   0
##                          capital.investments
## equity                                     0
## organizational sociology                   0
## performance                                0
## meta-analysis                              0
## psychometrics                              0
##                          consolidation...merger.of.corporations
## equity                                                       0
## organizational sociology                                     0
## performance                                                  0
## meta-analysis                                                0
## psychometrics                                                0
##                          executives....dismissal.of labor.turnover
## equity                                           0              0
## organizational sociology                         0              0
## performance                                      0              0
## meta-analysis                                    0              0
## psychometrics                                    0              0
##                          social.status generosity behavioral.research
## equity                               0          0                   0
## organizational sociology             0          0                   0
## performance                          0          0                   0
## meta-analysis                        0          0                   0
## psychometrics                        0          0                   0
```

```
##                          labor.productivity social.exchange social.factors
## equity                                    0               0              0
## organizational sociology                  0               1              0
## performance                               0               0              0
## meta-analysis                             0               0              0
## psychometrics                             0               0              0
##                          employees....attitudes....research employee.motivation
## equity                                                    0                   0
## organizational sociology                                  0                   2
## performance                                               0                   0
## meta-analysis                                             0                   0
## psychometrics                                             0                   0
##                          charismatic.authority self.congruence
## equity                                       0               0
## organizational sociology                     0               0
## performance                                  0               0
## meta-analysis                                0               0
## psychometrics                                0               0
##                          management.styles job.performance
## equity                                   0               0
## organizational sociology                 0               1
## performance                              0               0
## meta-analysis                            0               0
## psychometrics                            0               0
##                          goal.setting.in.personnel.management
## equity                                                      0
## organizational sociology                                    1
## performance                                                 0
## meta-analysis                                               0
## psychometrics                                               0
##                          reward..psychology. pygmalion..greek.mythology.
## equity                                     0                           0
## organizational sociology                   1                           1
## performance                                0                           0
## meta-analysis                              0                           0
## psychometrics                              0                           0
##                          galatea..sea.nymph..greek.deity. occupational.roles
## equity                                                  0                  0
## organizational sociology                                1                  1
## performance                                             0                  0
## meta-analysis                                           0                  0
## psychometrics                                           0                  0
##                          employee.rules human.error error.rates taiwanese
## equity                                0           0           0         0
## organizational sociology              0           0           0         0
## performance                           0           0           0         0
## meta-analysis                         0           0           0         0
## psychometrics                         0           0           0         0
##                          innovation.management cross.cultural.differences
## equity                                       0                          0
## organizational sociology                     0                          0
## performance                                  0                          0
## meta-analysis                                0                          0
## psychometrics                                0                          0
```

```
##                          corporate.image stockholders....attitudes
## equity                                 0                         0
## organizational sociology               0                         0
## performance                            0                         0
## meta-analysis                          0                         0
## psychometrics                          0                         0
##                          capitalists...financiers mass.media
## equity                                          0          0
## organizational sociology                        0          0
## performance                                     0          0
## meta-analysis                                   0          0
## psychometrics                                   0          0
##                          corporations....investor.relations
## equity                                                    0
## organizational sociology                                  0
## performance                                               0
## meta-analysis                                             0
## psychometrics                                             0
##                          mathematical.statistics
## equity                                         0
## organizational sociology                       0
## performance                                    0
## meta-analysis                                  0
## psychometrics                                  0
##                          corporations....public.relations public.companies
## equity                                                  0                0
## organizational sociology                                0                0
## performance                                             0                0
## meta-analysis                                           0                0
## psychometrics                                           0                0
##                          turnover..business. options..finance.
## equity                                     0                 0
## organizational sociology                   0                 0
## performance                                0                 0
## meta-analysis                              0                 0
## psychometrics                              0                 0
##                          corporations....valuation
## equity                                           0
## organizational sociology                         0
## performance                                      0
## meta-analysis                                    0
## psychometrics                                    0
##                          business.enterprises....valuation
## equity                                                   0
## organizational sociology                                 0
## performance                                              0
## meta-analysis                                            0
## psychometrics                                            0
##                          innovations.in.business shipbuilding.industry
## equity                                         0                     0
## organizational sociology                       0                     0
## performance                                    0                     0
## meta-analysis                                  0                     0
## psychometrics                                  0                     0
```

```
##                          technological.innovations....economic.aspects
## equity                                                               0
## organizational sociology                                             0
## performance                                                          0
## meta-analysis                                                        0
## psychometrics                                                        0
##                          success.in.business
## equity                                     0
## organizational sociology                   0
## performance                                0
## meta-analysis                              0
## psychometrics                              0
##                          work.environment....psychological.aspects
## equity                                                           0
## organizational sociology                                         0
## performance                                                      0
## meta-analysis                                                    0
## psychometrics                                                    0
##                          organizational.goals division.of.labor
## equity                                      0                 0
## organizational sociology                    1                 1
## performance                                 0                 0
## meta-analysis                               0                 0
## psychometrics                               0                 0
##                          international.business.enterprises....management
## equity                                                                   0
## organizational sociology                                                 1
## performance                                                              0
## meta-analysis                                                            0
## psychometrics                                                            0
##                          foreign.subsidiaries....management employee.selection
## equity                                                    0                  0
## organizational sociology                                  1                  1
## performance                                               0                  0
## meta-analysis                                             0                  0
## psychometrics                                             0                  0
##                          resource.based.theory.of.the.firm
## equity                                                   0
## organizational sociology                                 1
## performance                                              0
## meta-analysis                                            0
## psychometrics                                            0
##                          employment.in.foreign.countries
## equity                                                 0
## organizational sociology                               1
## performance                                            0
## meta-analysis                                          0
## psychometrics                                          0
##                          subsidiary.corporations....management
## equity                                                       0
## organizational sociology                                     1
## performance                                                  0
## meta-analysis                                                0
## psychometrics                                                0
```

```
##                          host.countries..business. human.capital....management
## equity                                           0                             0
## organizational sociology                         1                             0
## performance                                      0                             0
## meta-analysis                                    0                             0
## psychometrics                                    0                             0
##                          industrial.efficiency hospitals....administration
## equity                                       0                           0
## organizational sociology                     0                           0
## performance                                  0                           0
## meta-analysis                                0                           0
## psychometrics                                0                           0
##                          wage.payment.systems financial.management
## equity                                      0                    0
## organizational sociology                    0                    0
## performance                                 0                    0
## meta-analysis                               0                    0
## psychometrics                               0                    0
##                          cross.functional.teams group.identity
## equity                                        0              0
## organizational sociology                      1              1
## performance                                   1              1
## meta-analysis                                 0              0
## psychometrics                                 0              0
##                          service.industries....management customer.relations
## equity                                                  0                   0
## organizational sociology                                0                   0
## performance                                             0                   0
## meta-analysis                                           0                   0
## psychometrics                                           0                   0
##                          production.management labor.process
## equity                                       0              0
## organizational sociology                     0              0
## performance                                  0              0
## meta-analysis                                0              0
## psychometrics                                0              0
##                          customer.orientation marketing.strategy
## equity                                      0                   0
## organizational sociology                    0                   0
## performance                                 0                   0
## meta-analysis                               0                   0
## psychometrics                               0                   0
```