

M46-retail2

LearningSpoonsR

2019-01-27

Background

Goal

Data Review

Preprocessing

Results

Summary

Background

I. Background

- ▶ Continued from M43
 1. 배송 기간 분석 (Ship Date를 기반으로 배송이 가장 오래걸리는 상품은 무엇인가?)
 2. 마진이 가장 많이 남는 상품은 무엇인가?
 3. M46에서는 소비자 별 구매 기록을 분석해보자
- ▶ 맥주와 기저귀
 - ▶ Data-driven marketing의 고전적 예제
 - ▶ 맥주와 기저귀가 동시에 많이 팔린다.
 - ▶ Why? 아이를 위해 기저귀를, 나를 위해 맥주를 사는 아이 아빠들...
 - ▶ So what? 두 상품의 진열을 가깝게? 아니면 멀게해서 동선을 확보? 묶음 상품으로?
- ▶ Online Commerce?
 - ▶ “이 상품을 구매한 사람이 자주 본 물건”
 - ▶ “You may also like...”

Goal

II. Goal

목표 결과물 (Target output)

► From M24,

0. About
1. **Correlation: 두 변수가 얼마나 상관관계가 있는가?**
2. Deviation
3. Ranking
4. Distribution
5. Composition
6. Change
7. Groups

M24-ggplot2 Gallery

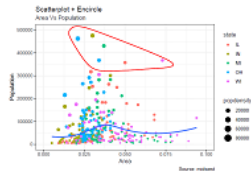
Learning Spoons 2019-01-20

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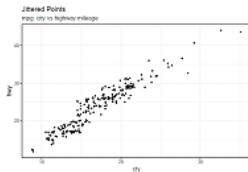
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목표 결과물 (Target output)

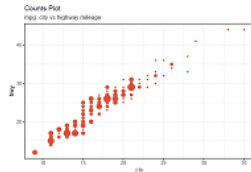
► From M24. 1. Correlation,



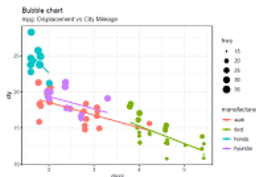
Scatterplot



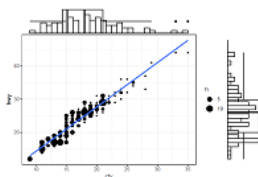
Jittered Plot



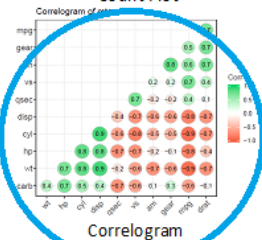
Count Plot



Bubble Chart



+ Histogram



Correlogram

필요한 데이터셋의 구조

We need...

	가격	기어	노크	재미
가격	1000	580	31	3
기어		1500	10	2
노크			5000	3
재미				570

Figure 1: 필요한 데이터 구조

for...

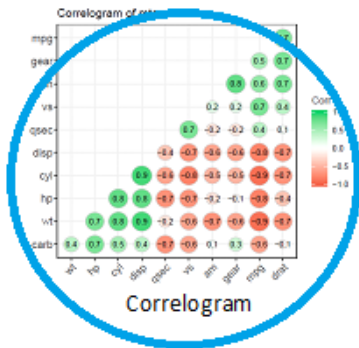


Figure 2: 최종 output 시안

Data Review

III. Data Review

```
library(tidyverse) # dplyr + ggplot2 + tidyr + ...

## -- Attaching packages ----- tidyverse 1.2.1 --
## v ggplot2 3.1.0      v purrr   0.2.5
## v tibble  2.0.1      v dplyr  0.7.8
## v tidyr   0.8.2      v stringr 1.3.1
## v readr   1.3.1      v forcats 0.3.0
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()

library(readxl)
dataset <- read_excel("retail.xlsx")
```

- ▶ tidyverse 많이도 포함하고 있네요.
- ▶ rmarkdown 문서에 r chunk의 아웃풋 출력을 안하려면 message=FALSE하면 됩니다.

이렇게 생긴 데이터이고...

```
str(dataset)
```

```
## Classes 'tbl_df', 'tbl' and 'data.frame':   9994 obs. of  20 variables:
## $ Country      : chr   "United States" "United States" "United States" "United States"
## $ Region       : chr   "East" "East" "South" "South" ...
## $ State        : chr   "Ohio" "Ohio" "Virginia" "Virginia" ...
## $ City         : chr   "Akron" "Akron" "Alexandria" "Alexandria" ...
## $ Postal Code  : num   44312 44312 22304 22304 22304 ...
## $ Category     : chr   "Furniture" "Furniture" "Furniture" "Furniture" ...
## $ Sub-Category : chr   "Tables" "Furnishings" "Furnishings" "Furnishings" ...
## $ Segment      : chr   "Corporate" "Consumer" "Corporate" "Home Office" ...
## $ Product Name : chr   "Chromcraft Rectangular Conference Tables" "Deflect-o Glass Clear
## $ Manufacturer : chr   "Chromcraft" "Deflect-o" "DAX" "Eldon" ...
## $ Customer Name: chr   "Ed Braxton" "Ted Trevino" "Andrew Gjertsen" "Shirley Daniels" .
## $ Order Date   : POSIXct, format: "2014-10-21" "2011-05-18" ...
## $ Order ID     : chr   "CA-2014-147277" "CA-2011-164224" "CA-2012-104241" "US-2011-1555
## $ Ship Date    : POSIXct, format: "2014-10-25" "2011-05-20" ...
## $ Ship Mode    : chr   "Standard Class" "Second Class" "Standard Class" "Standard Class"
## $ Discount     : num   0.4 0.2 0 0 0 0.3 0.2 0.32 0.3 0.6 ...
## $ Profit       : num   -76 4 69 4 31 -31 3 -36 -350 -11 ...
## $ Profit Ratio : num   -0.27 0.03 0.36 0.36 0.49 -0.13 0.29 -0.18 -0.14 -0.48 ...
## $ Quantity     : num    2 3 14 3 3 2 2 2 5 3 ...
## $ Sales        : num   284 149 192 12 63 ...
```

이런 변수들이 있구나...

```
colnames(dataset)
```

```
## [1] "Country"      "Region"      "State"      "City"
## [5] "Postal Code"  "Category"    "Sub-Category" "Segment"
## [9] "Product Name" "Manufacturer" "Customer Name" "Order Date"
## [13] "Order ID"     "Ship Date"   "Ship Mode"   "Discount"
## [17] "Profit"       "Profit Ratio" "Quantity"    "Sales"
```

관련 데이터는...

```
dataset %>% select(`Product Name`, `Customer Name`) %>% head()
```

```
## # A tibble: 6 x 2
##   `Product Name`      `Customer Name`
##   <chr>             <chr>
## 1 Chromcraft Rectangular Conference Tables Ed Braxton
## 2 Deflect-o Glass Clear Studded Chair Mats Ted Trevino
## 3 DAX Wood Document Frame Andrew Gjertsen
## 4 Eldon Image Series Black Desk Accessories Shirley Daniels
## 5 GE General Use Halogen Bulbs, 100 Watts, 1 Bulb per Pack Shirley Daniels
## 6 Chromcraft Round Conference Tables Anna Gayman
```

각각 컬럼의 **unique**한 value의 갯수는...

```
dataset %>% select(`Product Name`, `Customer Name`) %>%  
  sapply(function(x) length(unique(x)))
```

```
## Product Name Customer Name  
##           1850           793
```

암튼 dataset을 이용해서 Figure 1 모양의 구조를 만드는 preprocessing을 하면 되겠구나!

Preprocessing

Preprocessing 1: Assign IDs

Issue → Solution → Discussion → Implementation

Issue

1. Customer Name의 유일성 (uniqueness)
 - ▶ Akron에 사는 Barrack Obama → 기저귀 구매
 - ▶ L.A.에 사는 Barrack Obama → 맥주 구매
 - ▶ 그런데 둘은 다른 사람!
2. Product Name의 유일성과 value의 길이
 - ▶ 마찬가지로 유일성이 담보되지 않음
 - ▶ 값이 너무 김
 - ▶ ex) Chromcraft Rectangular Conference Tables

Discussion

1. ID variable 혹은 Key variable은 데이터를 체계적으로 관리하는 도구
2. 없다면 유일성을 담보할 수 있는 방법으로 만들어 내야 함
3. 체계적으로 준비된 데이터 셋은 join 및 조회가 용이함

Solution

1. Customer Name의 유일성 (uniqueness)

- ▶ 각각 다른 CustomerID가 있어야 함
- ▶ Postal Code(44312)와 Customer Name (Ed Braxton)으로 CustomerID를 만들자.
- ▶ cus01321와 같은 형식으로 만들자.

2. Product Name의 유일성과 value의 길이

- ▶ 각각 다른 ProductID가 있어야 함.
- ▶ Manufacturer와 Product Name으로 ProductID를 만들자.
- ▶ prod08231와 같은 형식으로 만들자.

Implementation

Step 1. unique를 사용해서 유일한 조합을 생성하여 customerTable에 저장

```
customerTable <- dataset %>% select(`Postal Code`, `Customer Name`) %>% unique()  
customerTable %>% head()
```

```
## # A tibble: 6 x 2  
##   `Postal Code` `Customer Name`  
##         <dbl> <chr>  
## 1      44312 Ed Braxton  
## 2      44312 Ted Trevino  
## 3      22304 Andrew Gjertsen  
## 4      22304 Shirley Daniels  
## 5      75002 Anna Gayman  
## 6      18103 Caroline Jumper
```

Step 1-1. 구매기록에 몇명의 고객이 있는지 확인

```
dim(customerTable)  
## [1] 4910    2
```

Step 1-2. CustomerID 변수를 만들기

1. 일련 번호 생성
2. google “how to add leading zeros R”

```
library(stringr)
x <- 1:nrow(customerTable) %>% str_pad(5, pad = "0") # make 5-digit string by padding "0"
head(x, 3)

## [1] "00001" "00002" "00003"
```

3. CustomerID 변수 완성

```
customerTable$CustomerID <- paste0("cus", x)
customerTable %>% head(3)

## # A tibble: 3 x 3
##   `Postal Code` `Customer Name` CustomerID
##         <dbl> <chr>          <chr>
## 1      44312 Ed Braxton      cus00001
## 2      44312 Ted Trevino     cus00002
## 3      22304 Andrew Gjertsen  cus00003
```

Step 2. 같은 방법으로 productTable 만들기

```
productTable <- dataset %>% select(Manufacturer, `Product Name`) %>% unique()
productTable <- productTable %>%
  mutate(ProductID = paste0("prod",
                             1:nrow(productTable) %>% str_pad(5, pad = "0")))
productTable %>% head(3)
```

```
## # A tibble: 3 x 3
##   Manufacturer `Product Name`      ProductID
##   <chr>         <chr>             <chr>
## 1 Chromcraft   Chromcraft Rectangular Conference Tables prod00001
## 2 Deflect-o    Deflect-o Glass Clear Studded Chair Mats prod00002
## 3 DAX          DAX Wood Document Frame             prod00003
```

Step 3. 원래 데이터셋에 CustomerID와 ProductID를 부여

Step 3-1. CustomerID 부여

```
head(dataset[,c(5, 11:12)], 2)
```

```
## # A tibble: 2 x 3
##   `Postal Code` `Customer Name` `Order Date`
##         <dbl> <chr>          <dtm>
## 1      44312 Ed Braxton      2014-10-21 00:00:00
## 2      44312 Ted Trevino    2011-05-18 00:00:00
```

```
head(customerTable, 2)
```

```
## # A tibble: 2 x 3
##   `Postal Code` `Customer Name` CustomerID
##         <dbl> <chr>          <chr>
## 1      44312 Ed Braxton      cus00001
## 2      44312 Ted Trevino    cus00002
```

```
dataset <- left_join(x = dataset, y = customerTable,
                     by = c("Postal Code", "Customer Name"))
dataset[,c(5, 11:12, 21)] %>% head(2)
```

```
## # A tibble: 2 x 4
##   `Postal Code` `Customer Name` `Order Date`      CustomerID
##         <dbl> <chr>          <dtm>          <chr>
## 1      44312 Ed Braxton      2014-10-21 00:00:00 cus00001
## 2      44312 Ted Trevino    2011-05-18 00:00:00 cus00002
```

성공!

Step 3-2. 같은 방법으로 ProductID 부여

```
dataset <- left_join(x = dataset, y = productTable,  
                    by = c("Manufacturer", "Product Name"))
```

Step 4. 전처리 완료! 필요한 변수만 모아서 dataset2라고 이름 붙임!

```
dataset2 <- dataset %>%  
  select(CustomerID, ProductID, `Postal Code`,  
         `Customer Name`, Manufacturer, `Product Name`) %>%  
  arrange(CustomerID, ProductID)  
dataset2[108:110,]  
  
## # A tibble: 3 x 6  
##   CustomerID ProductID `Postal Code` `Customer Name` Manufacturer  
##   <chr>      <chr>      <dbl> <chr>          <chr>  
## 1 cus00038  prod00047      60505 Barry Franzosi~ Global  
## 2 cus00038  prod00543      60505 Barry Franzosi~ Acco  
## 3 cus00038  prod00550      60505 Barry Franzosi~ TOPS  
## # ... with 1 more variable: `Product Name` <chr>
```


Preprocessing 2

Strategy

Customer ID	Product ID	Customer ID	Purchase Records
Cus0001	Prod0001	Cust0001	Prod0001, Prod0005, ...
Cus0001	Prod0005	Cust0002	" 0007, " 0008, " 0003
" 0002	" 0007		
" 0002	" 0008		
" 0002	" 0003		

Step 2

	Prod0001	Prod0002	Prod0003	...
Prod0001	27	3	20	
Prod0002				
:				
:				
:				

Step 2

Implementation - Step 1

Before

```
dataset2 %>%  
  select(CustomerID, ProductID) %>%  
  head()
```

```
## # A tibble: 6 x 2  
##   CustomerID ProductID  
##   <chr>      <chr>  
## 1 cus00001   prod00001  
## 2 cus00001   prod00384  
## 3 cus00002   prod00002  
## 4 cus00002   prod00396  
## 5 cus00003   prod00003  
## 6 cus00004   prod00004
```

After

```
purchase <- dataset2 %>%  
  group_by(CustomerID) %>%  
  summarise(  
    Purchases =  
      paste(ProductID, collapse = " ")  
  )  
head(purchase)
```

```
## # A tibble: 6 x 2  
##   CustomerID Purchases  
##   <chr>      <chr>  
## 1 cus00001   prod00001 prod00384  
## 2 cus00002   prod00002 prod00396  
## 3 cus00003   prod00003  
## 4 cus00004   prod00004 prod00005 prod00411  
## 5 cus00005   prod00006 prod00415  
## 6 cus00006   prod00007 prod00417
```

Implementation - Step 2

Prepare an empty matrix,
`purchaseCount`

```
uProductID <- unique(dataset2$ProductID)
purchaseCount <-
  array(0, c(length(uProductID), length(uProductID)))
colnames(purchaseCount) <- uProductID
rownames(purchaseCount) <- uProductID
purchaseCount[1:4, 1:3]
```

```
##           prod00001 prod00384 prod00002
## prod00001           0           0           0
## prod00384           0           0           0
## prod00002           0           0           0
## prod00396           0           0           0
```

And with `purchase$Purchase`

```
purchase$Purchase %>% head(3)
```

```
## [1] "prod00001 prod00384" "prod00002 prod00396"
```

Fill purchaseCount

```
library(stringr)
a <- Sys.time()
for (i in 1:nrow(purchaseCount)) {
  for (j in 1:nrow(purchaseCount)) {
    purchaseCount[i,j] <-
      sum(
        str_detect(purchase$Purchases, uProductID[i]) &
        str_detect(purchase$Purchases, uProductID[j]))
  }
}
b <- Sys.time()
save.image(file = "M46_middle.Rdata")
library(beepr)
beep()
```

```
purchaseCount[1:4,1:3]
```

```
##           prod00001 prod00384 prod00002
## prod00001         9         1         0
## prod00384         1         5         0
## prod00002         0         0         7
## prod00396         0         0         1
```

```
a
## [1] "2019-01-21 15:16:40 KST"
b
## [1] "2019-01-21 18:16:16 KST"
b-a
## Time difference of 2.993472 hours
```

▶ Code Review

- ▶ 시간이 오래걸린 작업이므로 `save.image(file = "M46_middle.Rdata")`로 현재 메모리 상태 저장
- ▶ `load("M46_middle.Rdata")`를 이용하면 저장된 메모리 상태 불러올 수 있음
- ▶ 소요시간 확인을 위해서 `a`와 `b`를 기록
- ▶ `library(beepR)`, `beep()`으로 소리를 내어서 작업 완료를 알려줌 (기다리면서는 무엇을 하나요? 카톡)

▶ Discussion

- ▶ 속도를 빠르게 하려면 어떻게 해야할까요?
- ▶ Hint?

Results

Result 1

Step. 1. 각 ProductID별로 pair 구매 건수를 집계하고 정렬

- ▶ purchaseCount의 각 column의 합을 구하고...
- ▶ 해당 제품 구매 건수를 빼주면 pair 구매 건수가 집계됨
- ▶ 그것을 내림차순으로 정렬하면 pairCount완성

```
pairCount <- colSums(purchaseCount) - diag(purchaseCount)
pairCount <- sort(pairCount, decreasing = TRUE)
head(pairCount)
```

```
## prod00579 prod00445 prod00423 prod00116 prod00156 prod00018
##          104          90          80          48          46          43
```


Step. 2. pair 구매가 많았던 8개 ProductID만 골라서 8 by 8 표로 표현

- ▶ `mat_size`를 8로 지정
- ▶ `pairCount[1:mat_size]`의 `names`들이 `productID` 형식으로 표현되어 있으므로...
- ▶ `names()`를 이용해서 `purchaseCount`를 subsetting함!!

```
mat_size <- 8
pair_mat <- purchaseCount[names(pairCount[1:mat_size]),
                           names(pairCount[1:mat_size])]
pair_mat %>% head()
```

```
##           prod00579 prod00445 prod00423 prod00116 prod00156 prod00018
## prod00579          46          0          1          2          0          0
## prod00445          0          48          1          1          0          0
## prod00423          1          1         46          0          0          0
## prod00116          2          1          0         18          0          0
## prod00156          0          0          0          0         14          1
## prod00018          0          0          0          0          1         14
##           prod00469 prod00476
## prod00579          0          0
## prod00445          0          0
## prod00423          0          1
## prod00116          0          0
## prod00156          1          0
## prod00018          0          0
```

Figure 1 완성!!!

- ▶ pair_mat의 index들을 productID형식에서 productName형식으로 바꾸려면?
- ▶ 먼저 productTable을 이용해서 pair_mat의 ID를 매치시킴

```
pair_mat_name <-  
  left_join(data.frame(ProductID = colnames(pair_mat)), productTable)  
  
## Joining, by = "ProductID"  
## Warning: Column `ProductID` joining factor and character vector, coercing  
## into character vector  
pair_mat_name %>% head()  
  
##   ProductID      Manufacturer  
## 1 prod00579             Other  
## 2 prod00445   Staple envelope  
## 3 prod00423 Easy-staple paper  
## 4 prod00116              KI  
## 5 prod00156             Eldon  
## 6 prod00018           Global  
##  
##               Product Name  
## 1                   Staples  
## 2           Staple envelope  
## 3       Easy-staple paper  
## 4      KI Adjustable-Height Table  
## 5      Eldon Wave Desk Accessories  
## 6 Global Wood Trimmed Manager's Task Chair, Khaki
```

▶ pair_mat의 rownames를 교체

```
rownames(pair_mat) <- pair_mat_name[, "Product Name"] %>% substr(1,20)
pair_mat
```

##	prod00579	prod00445	prod00423	prod00116	prod00156
## Staples	46	0	1	2	0
## Staple envelope	0	48	1	1	0
## Easy-staple paper	1	1	46	0	0
## KI Adjustable-Height	2	1	0	18	0
## Eldon Wave Desk Acce	0	0	0	0	14
## Global Wood Trimmed	0	0	0	0	1
## Hot File 7-Pocket, F	0	0	0	0	1
## Storex Dura Pro Bind	0	0	1	0	0
##	prod00018	prod00469	prod00476		
## Staples	0	0	0		
## Staple envelope	0	0	0		
## Easy-staple paper	0	0	1		
## KI Adjustable-Height	0	0	0		
## Eldon Wave Desk Acce	1	1	0		
## Global Wood Trimmed	14	0	0		
## Hot File 7-Pocket, F	0	13	0		
## Storex Dura Pro Bind	0	0	17		

진짜로 Figure 1 완성!!!

Step. 3. pair 구매가 2회 이상이었던 10개 case를 random하게 출력

```
topPair_N <- 10
# Replace diagonals to 0
purchaseCount_offdiag <- purchaseCount
diag(purchaseCount_offdiag) <- 0
# Find >=2 counts and build data.frame
top_indexes <-
  which(purchaseCount_offdiag >= 2, arr.ind = TRUE) %>% data.frame()
top_indexes %>% head()

##           row col
## prod00543 106  27
## prod00394 212  33
## prod01458  41  35
## prod00270 694  39
## prod00435  35  41
## prod01466  68  64
colnames(purchaseCount_offdiag) %>% head()

## [1] "prod00001" "prod00384" "prod00002" "prod00396" "prod00003" "prod00004"
```

```
Top_N <- data.frame(  
  ID_x = apply(top_indexes, 1,  
               function(x) colnames(purchaseCount_offdiag)[x[1]]),  
  ID_y = apply(top_indexes, 1,  
               function(x) colnames(purchaseCount_offdiag)[x[2]]),  
  count = apply(top_indexes, 1,  
                function(x) purchaseCount_offdiag[x[1], x[2]]),  
  stringsAsFactors = FALSE,  
  row.names = NULL  
)  
# replace ID with `ProductID` using `left_join`  
Top_N <- Top_N %>%  
  left_join(productTable, by = c("ID_x"="ProductID")) %>%  
  select(`Product Name`, ID_y, count) %>%  
  left_join(productTable, by = c("ID_y"="ProductID")) %>%  
  select(`Product Name.x`, `Product Name.y`, count)
```

```
Top_N[,1] <- substr(Top_N[,1], 1, 30)
Top_N[,2] <- substr(Top_N[,2], 1, 30)
Top_N %>% head(2)
```

```
##           Product Name.x           Product Name.y count
## 1      Acco Hot Clips Clips to Go      Flat Face Poster Frame      2
## 2 Wilson Jones Active Use Binder GBC Recycled VeloBinder Covers      2
```

Top_N에서 random하게 topPair_N개 행을 뽑으면 끝!

```
Top_N[sample(1:nrow(Top_N), topPair_N),]
```

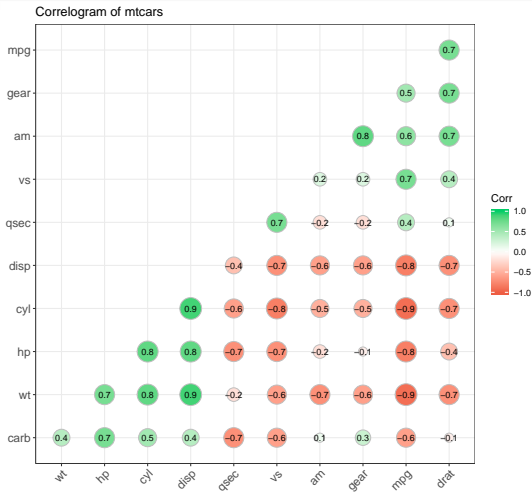
```
##           Product Name.x           Product Name.y count
## 62 Avery Fluorescent Highlighter Acco Side-Punched Conventional      2
## 42 Peel & Stick Add-On Corner Poc      Easy-staple paper      2
## 31           Newell 34           Staple envelope      2
## 32           Xerox 1971           Staple envelope      2
## 53 Carina Double Wide Media Stora 1.7 Cubic Foot Compact "Cube"      2
## 9  DMI Eclipse Executive Suite Bo           Avery 485      2
## 55 1.7 Cubic Foot Compact "Cube" Carina Double Wide Media Stora      2
## 48 Belkin Premiere Surge Master I SAFCO Optional Arm Kit for Wor      2
## 47           Xerox 192 X-Rack File for Hanging Folder      2
## 35           OIC Binder Clips      Eldon Wave Desk Accessories      2
```

Result 2

Step. 1. 예제 코드를 이용해 Correlogram 그리기 연습

```
library(ggplot2)
library(ggcorrplot)
data(mtcars)
corr <- round(cor(mtcars), 1)
fig_sample <-
  ggcorrplot(
    corr, hc.order = TRUE, type = "lower", lab = TRUE,
    lab_size = 3, method="circle",
    colors = c("tomato2", "white", "springgreen3"),
    title="Correlogram of mtcars", ggtheme=theme_bw)
```

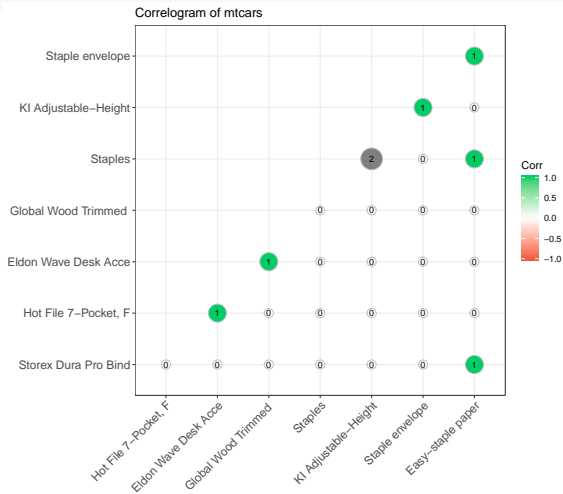
fig_sample



Step. 2. pair_mat를 이용해 correlogram 그리기

```
colnames(pair_mat) <- rownames(pair_mat)
fig_corr <-
  ggcorrplot(
    pair_mat, hc.order = TRUE, type = "lower", lab = TRUE,
    lab_size = 3, method="circle",
    colors = c("tomato2", "white", "springgreen3"),
    title="Correlogram of mtcars", ggtheme=theme_bw)
```

fig_corr



Summary

Summary

```
save.image("M46_final.Rdata")
```

- ▶ Result1
 - ▶ Step. 2.
 - ▶ pair_mat
 - ▶ pair 구매가 많았던 8개 ProductID만 골라서 8 by 8 표로 표현
 - ▶ Step. 3.
 - ▶ Top_N
 - ▶ pair 구매가 2회 이상이었던 10개 case를 random하게 출력
- ▶ Result2
 - ▶ Step. 2.
 - ▶ fig_corr
 - ▶ pair_mat를 이용해 correlogram 그리기

Shiny Presentation

1. `load("M46_final.Rdata")`를 이용해서 데이터를 불러옵니다.
2. 위의 8과 10을 사용자의 인풋으로 받아서 다음 작업을 수행합니다.
3. Correlogram
 - ▶ `input$mat_size`를 `seq(from = 8, to = 14, by = 2)`에서 선택
 - ▶ `pair_mat` 만들기 (from `purchaseCount` and `productTable`)
 - ▶ `fig_corr` 만들기 (from `pair_mat`)
4. Top_N table
 - ▶ `input$topPair_N`를 `seq(from = 10, to = 30, by = 5)`에서 선택
 - ▶ Top_N 만들기 (from `purchaseCount` and `productTable`)
5. flexdashboard + shiny로 다음을 포함한 대시보드를 만들어 보세요.
 - ▶ 사용자 인풋창
 - ▶ 3번 결과물
 - ▶ 4번 결과물

- ▶ Verumtamen oportet me bodie et cras et sequenti die ambulare.
- ▶ 오늘도 내일도 그 다음날도 계속해서 내 길을 가야 한다.