

Chapter 10. Text Mining

1. 소개

7 장의 스팸메일 문제를 apriori 기법을 텍스트 마이닝에 도입해 풀어보자.

텍스트 마이닝의 문제 유형과 분석 방법

- 군집: 이 문서의 주제는 무엇인가?
- 상관관계: 단어와 단어 사이의 상관관계는 어떻게 되는가?
- 연관관계: 주로 같이 나오는 단어들의 집합은 어떻게 되는가?
- 인과관계: 이 단어가 나온 후에 얼마 후에 특정 단어가 나오는가? (시계열 개념)

사전 작업

- stopword(불용어)를 빼준다
- 특수문자, 공란, 대소문자의 처리
- 감성사전: 형태소 분석을 한 후 업무의 성격에 따라 단어에 대한 긍정이나 부정을 점수로 만들어

1) 주제별 군집 분석

1-1) 준비작업: 파일을 읽어들이 DataframeSource 에 넣고 Corpus 라는 객체로 만들어서 DocumentTermMatrix 나 TermDocumentMatrix 형태로 만들어 준다

Introduction to KoNLP API 최신자료

```
#install.packages("KoNLP", dependencies = TRUE, repos = c(CRAN="http://cran.n  
exr.com/"))  
library(KoNLP)  
  
## Checking user defined dictionary!  
  
useSejongDic()  
  
## Backup was just finished!  
## 370957 words dictionary was built.
```

```

#install.packages("tm")
library(tm)

## Loading required package: NLP

docs <- read.csv("data/sms_spam.csv", header = T, stringsAsFactors = F)
docs

##      title
## 1  soccer
## 2 network
## 3   food
##

## 1
Barcelona a
nd Arsenal are joining a marketplace that is rapidly becoming more crowded, a
dding a sheen on one layer of the thickly tiered cake that makes up American
youth soccer development. They join more established affiliates from European
powers such as Liverpool FC and Bayern Munich, all of which are competing ag
ainst traditional American developmental academies to attract the most talent
ed, young?sometimes very young?soccer players around the country.
## 2 The remainder of the chapter discusses deep learning from a broader and
less detailed perspective. We'll briefly survey other models of neural networ
ks, such as recurrent neural nets and long short-term memory units, and how s
uch models can be applied to problems in speech recognition, natural language
processing, and other areas. And we'll speculate about the future of neural
networks and deep learning, ranging from ideas like intention-driven user int
erfaces, to the role of deep learning in artificial intelligence.
## 3

But some may balk at th
e idea of rubbing raw garlic directly to their skin. It seems a lot of people
just can't stand the smell of garlic even when it is just used to flavor foo
d. This method would be particularly challenging to this group of people as i
t requires to leave the garlic sap on the trouble area overnight.
##      type
## 1  soccer
## 2 network
## 3   food

corpus <- Corpus(DataframeSource(docs[,1:2]))
inspect(corpus[1:3])

## <<VCorpus>>
## Metadata: corpus specific: 0, document level (indexed): 0

```

```
## Content:  documents: 3
##
## [[1]]
## <<PlainTextDocument>>
## Metadata:  7
## Content:   chars: 467
##
## [[2]]
## <<PlainTextDocument>>
## Metadata:  7
## Content:   chars: 529
##
## [[3]]
## <<PlainTextDocument>>
## Metadata:  7
## Content:   chars: 323
```

1-2)정제작업: 공란을 없애거나 특수문자를 제거

```
corpus_clean <- tm_map(corpus, tolower)
corpus_clean <- tm_map(corpus_clean , removeNumbers)
corpus_clean <- tm_map(corpus_clean , removeWords , stopwords())
corpus_clean <- tm_map(corpus_clean , removePunctuation)
```

```
lapply(corpus_clean,as.character)
```

```
## $`1`
## [1] "soccer"
```

```
## [2] "Barcelona and Arsenal are joining a marketplace that is rapidly becoming more crowded, adding a sheen on one layer of the thickly tiered cake that makes up American youth soccer development. They join more established affiliates from European powers such as Liverpool FC and Bayern Munich, all of which are competing against traditional American developmental academies to attract the most talented, young?sometimes very young?soccer players around the country."
```

```
##
## $`2`
## [1] "network"
```

```
## [2] "The remainder of the chapter discusses deep learning from a broader and less detailed perspective. We'll briefly survey other models of neural networks, such as recurrent neural nets and long short-term memory units, and how such models can be applied to problems in speech recognition, natural language processing, and other areas. And we'll speculate about the future of neural networks and deep learning, ranging from ideas like intention-driven user interfaces, to the role of deep learning in artificial intelligence."
##
## $`3`
## [1] "food"
```

```
## [2] "But some may balk at the idea of rubbing raw garlic directly to their skin. It seems a lot of people just can't stand the smell of garlic even when it is just used to flavor food. This method would be particularly challenging to this group of people as it requires to leave the garlic sap on the trouble area overnight."
```

1-3) TermDocumentMatrix: 단어-문서 행렬로 만들기, 이때 Tf-Idf 방식으로 가중치 함수를 정해줌 (설정 안하면 default 로 frequency)

```
sms_dtm <- TermDocumentMatrix(corpus , control = list(weighting=weightTfIdf))
inspect(sms_dtm)

## <<TermDocumentMatrix (terms: 134, documents: 3)>>
## Non-/sparse entries: 136/266
## Sparsity          : 66%
## Maximal term length: 16
## Weighting         : term frequency - inverse document frequency (normalized) (tf-idf)
## Sample           :
##           Docs
## Terms           1           2           3
## american 0.05372754 0.00000000 0.00000000
## and       0.01982924 0.05086630 0.00000000
## are       0.05372754 0.00000000 0.00000000
## deep      0.00000000 0.06891141 0.00000000
## garlic    0.00000000 0.00000000 0.10566417
## just      0.00000000 0.00000000 0.07044278
## more      0.05372754 0.00000000 0.00000000
## neural    0.00000000 0.06891141 0.00000000
## people    0.00000000 0.00000000 0.07044278
## this      0.00000000 0.00000000 0.07044278
```

TF*IDF 값이 클 수록 해당 단어가 문서를 잘 설명 TF (Term Frequency): 빈번하게 자주 나타나는 정도. 해당 주제가 자주 등장하는 단어가 문서를 잘 설명하는 단어. IDF (Inverse Document Frequency): 단어가 출현한 문서의 역수. 즉, 해당하는 단어가 다른 주제가 아닌 바로 그 특정 문서에서만 나타나는 정도를 나타는 정도 이때 TF 는 문서의 길이에 비례하므로 이를 고려해 정규화

```
sms_dtm3 <- TermDocumentMatrix(corpus)
inspect(sms_dtm3)

## <<TermDocumentMatrix (terms: 134, documents: 3)>>
## Non-/sparse entries: 139/263
## Sparsity          : 65%
## Maximal term length: 16
## Weighting         : term frequency (tf)
## Sample           :
##           Docs
## Terms      1 2 3
## american  2 0 0
## and        2 6 0
## are        2 0 0
## deep       0 3 0
## from       1 2 0
## garlic     0 0 3
## just       0 0 2
## neural     0 3 0
## such       1 2 0
## the        3 4 4
```

1-4) 행렬객체를 탐색하는 함수 구현 - findFreqTerms: frequency 가 최소 얼마 이상인 단어만 검색 - findAssocs: 특정 단어와 상관계수가 얼마 이상인 단어들을 모두 검색

```
findFreqTerms(TermDocumentMatrix(corpus) , lowfreq = 2)

## [1] "american" "and"      "are"      "deep"     "from"     "garlic"
## [7] "just"      "learning" "models"   "more"     "neural"   "other"
## [13] "people"    "soccer"   "such"     "that"     "the"      "this"
## [19] "we'll"
```

```
findAssocs(TermDocumentMatrix(corpus) , "user" , 0.5)

## $user
##           about          applied          areas.          artificial
##           1.00           1.00           1.00           1.00
##           briefly         broader           can           chapter
##           1.00           1.00           1.00           1.00
##           deep           detailed         discusses         future
```

##	1.00	1.00	1.00	1.00
##	how	ideas	intelligence.	intention-driven
##	1.00	1.00	1.00	1.00
##	interfaces,	language	learning	learning,
##	1.00	1.00	1.00	1.00
##	less	like	long	memory
##	1.00	1.00	1.00	1.00
##	models	natural	nets	network
##	1.00	1.00	1.00	1.00
##	networks	networks,	neural	other
##	1.00	1.00	1.00	1.00
##	perspective.	problems	processing,	ranging
##	1.00	1.00	1.00	1.00
##	recognition,	recurrent	remainder	role
##	1.00	1.00	1.00	1.00
##	short-term	speculate	speech	survey
##	1.00	1.00	1.00	1.00
##	units,	we'll	and	from
##	1.00	1.00	0.94	0.87
##	such	the		
##	0.87	0.50		

1-5) 문서-단어 행렬을 통해 본격적으로 문서를 분류하기 위한 모델 만들기

```
sms_dtm2 <- DocumentTermMatrix(corpus , control = list(weighting = weightTfId
f))
inspect(sms_dtm2)

## <<DocumentTermMatrix (documents: 3, terms: 134)>>
## Non-/sparse entries: 136/266
## Sparsity          : 66%
## Maximal term length: 16
## Weighting         : term frequency - inverse document frequency (normaliz
ed) (tf-idf)
## Sample           :
##   Terms
## Docs  american      and      are      deep      garlic      just
##   1 0.05372754 0.01982924 0.05372754 0.00000000 0.00000000 0.00000000
##   2 0.00000000 0.05086630 0.00000000 0.06891141 0.00000000 0.00000000
##   3 0.00000000 0.00000000 0.00000000 0.00000000 0.1056642 0.07044278
##   Terms
## Docs      more      neural      people      this
##   1 0.05372754 0.00000000 0.00000000 0.00000000
##   2 0.00000000 0.06891141 0.00000000 0.00000000
##   3 0.00000000 0.00000000 0.07044278 0.07044278
```

1-6) 뉴럴네트워크 적용

```

#install.packages("caret")
#install.packages("rpart")
#install.packages("nnet")
library(caret)

## Loading required package: lattice

## Loading required package: ggplot2

##
## Attaching package: 'ggplot2'

## The following object is masked from 'package:NLP':
##
##      annotate

library(rpart)
library(nnet)
sms_dtm2_df <- cbind(as.data.frame(as.matrix(sms_dtm2)) , LABEL = docs$type)
m <- nnet(LABEL ~ . , data = sms_dtm2_df , size = 3) #nnet 함수에 넣어 모델링

## # weights:  417
## initial  value 3.903237
## iter   10 value 1.482491
## iter   20 value 0.001866
## final   value 0.000070
## converged

predict(m , newdata = sms_dtm2_df)

##           food           network           soccer
## 1 5.085029e-21 1.230412e-08 1.000000e+00
## 2 5.724120e-05 9.999304e-01 1.237480e-05
## 3 9.999999e-01 8.749884e-08 1.191668e-19

```

3 건의 데이터 모두 높은 확률로 3 개의 주제로 분류함. 수치는 뉴럴네트워크의 특성상 실행때마다 조금씩 달라질 수 있음

2) 생활 속의 문제 : 백화점 CIC 분석

백화점 고객 전화통화의 매일의 불만거리 내용을 단어별로 분석하여 텍스트마이팅을 하여 단어별 상관관계나 연관탐사를 하거나 특정단어의 시계열패턴 또는 단어끼리의 시계열 상관관계를 보고자 함.

2-1) 전처리

```

library(stringr) #for str_replace_all
advice <- read.csv("data/advice.csv" , header = T , stringsAsFactors = F)
advice[1,]

##          DATE
## 1 2016-01-10
##

                                CONTENTS
## 1 스킨을 샀는데 포장이 지저분합니다. 교환해주세요\n 스패를 샀는데 안에 곰팡이가
  끼었습니다. 기분이 아주 나쁩니다. 환불해주세요

place <- sapply(advice[,2] , extractNoun , USE.NAMES = F) #명사로 쪼갬
place

## [[1]]
##  [1] "스킨"      "포장"      "지저분"    "교환"      "스패를"
##  [6] "안"        "곰팡이"    "끼"        "기분"      "환불해주세요"
##
## [[2]]
##  [1] "화장품"    "세트"      "샤은품"    "못받았어요" "라면"
##  [6] "한"        "상자"      "포장"      "중간"
##
## [[3]]
##  [1] "해산물"    "코너"      "직원"      "불친절합니다"
##  [5] "고등어"    "싱싱"      "초밥"      "것"
##
## [[4]]
##  [1] "식당"      "매운탕"   "아이"      "배"        "병원"      "이불"      "실밥"
##
## [[5]]
##  [1] "양복"      "교환"     "구두"      "흙"        "환불"      "바"
##
## [[6]]
##  [1] "노트북"    "전원"     "TV"        "모니터"    "이상"

c <- unlist(place)
place2 <- Filter(function(x) {nchar(x) >=2 & nchar(x) <= 5} , c) #2~5 글자인
  것만 filter
res <- str_replace_all(place2 , "[^[:alpha:]]" , "") #특수문자와 제거
res <- res[res != ""] #공란 제거
res

```



```
## [1] "스킨"      "포장"      "지저분"    "교환"      "스팸을"
## [6] "곰팡이"    "기분"      "환불해주세요" "화장품"    "세트"
## [11] "사은품"    "못받았어요" "라면"      "상자"      "포장"
## [16] "중간"      "해산물"    "코너"      "직원"      "고등어"
## [21] "싱싱"      "초밥"      "식당"      "매운탕"    "아이"
## [26] "병원"      "이불"      "실밥"      "양복"      "교환"
## [31] "구두"      "환불"      "노트북"    "전원"      "TV"
## [36] "모니터"    "이상"
```

2-2) 정렬을 통해 자주 나오는 단어를 위주로 keyword 생성

```
wordcount <- table(res)
wordcount2 <- sort(table(res) , decreasing=T)
wordcount2 #교환건수와 포장에 불만이 가장 많음
```

```
## res
##      교환      포장      TV      고등어      곰팡이      구두
##      2        2        1        1        1        1
##      기분      노트북      라면      매운탕      모니터      못받았어요
##      1        1        1        1        1        1
##      병원      사은품      상자      세트      스킨      스팸을
##      1        1        1        1        1        1
##      식당      실밥      싱싱      아이      양복      이불
##      1        1        1        1        1        1
##      이상      전원      중간      지저분      직원      초밥
##      1        1        1        1        1        1
##      코너      해산물      화장품      환불      환불해주세요
##      1        1        1        1        1
```

2-3) 워드클라우드를 그려보고 keyword 생성

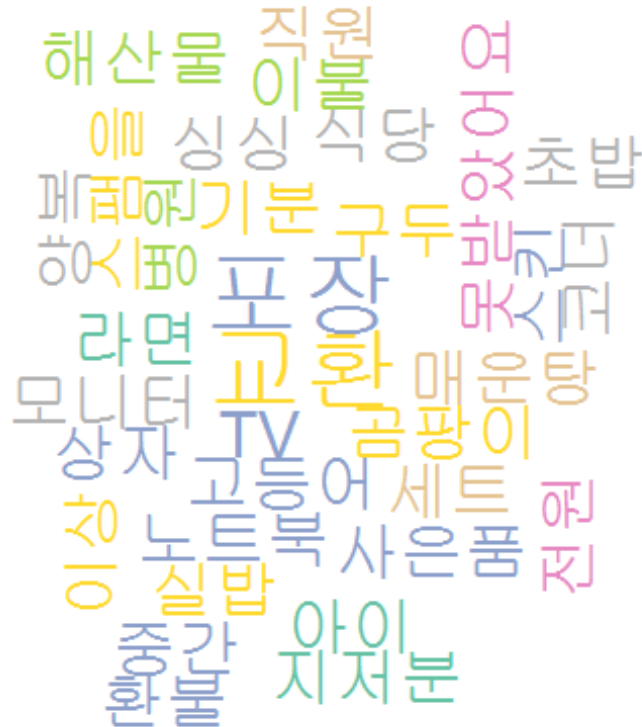
```
#install.packages("wordcloud")
#install.packages("RColorBrewer")
library(wordcloud);

## Loading required package: RColorBrewer

library(RColorBrewer)
palette <- brewer.pal(8 , "Set2") #palette 의 색(>=3)을 8 개로 선정
#?wordcloud
wordcloud(names(wordcount) , freq = wordcount , scale=c(3,1) , rot.per = 0.25
, min.freq = 1 , random.order = F , random.color = T , colors = palette)
```

```
## Warning in wordcloud(names(wordcount), freq = wordcount, scale = c(3, 1), :
## 화장품 could not be fit on page. It will not be plotted.

## Warning in wordcloud(names(wordcount), freq = wordcount, scale = c(3, 1), :
## 환불해주세요 could not be fit on page. It will not be plotted.
```



```
keyword <- dimnames(wordcount2[1:10])$res
keyword

## [1] "교환" "포장" "TV" "고등어" "곰팡이" "구두" "기분"
## [8] "노트북" "라면" "매운탕"
```

2-4) 날짜-단어 행렬 생성

```
contents <- c()
for(i in 1:6) {
  inter <- intersect(place[[i]] , keyword)
  contents <- rbind(contents ,table(inter)[keyword])
}

inter #"노트북" "TV"

## [1] "노트북" "TV"
```

```
contents
```

```
##      교환 포장 <NA> <NA> 곰팡이 <NA> 기분 <NA> <NA> <NA>
## [1,]      1      1      NA      NA      1      NA      1      NA      NA      NA
## [2,]      NA      1      NA      NA      NA      NA      NA      NA      1      NA
## [3,]      NA      NA      NA      1      NA      NA      NA      NA      NA      NA
## [4,]      NA      NA      NA      NA      NA      NA      NA      NA      NA      1
## [5,]      1      NA      NA      NA      NA      1      NA      NA      NA      NA
## [6,]      NA      NA      1      NA      NA      NA      NA      1      NA      NA
```

```
rownames(contents) <- advice$DATE
colnames(contents) <- keyword
contents[which(is.na(contents))] <- 0
contents
```

```
##      교환 포장 TV 고등어 곰팡이 구두 기분 노트북 라면 매운탕
## 2016-01-10      1      1      0      0      1      0      1      0      0      0
## 2016-01-11      0      1      0      0      0      0      0      0      1      0
## 2016-01-12      0      0      0      1      0      0      0      0      0      0
## 2016-01-13      0      0      0      0      0      0      0      0      0      1
## 2016-01-14      1      0      0      0      0      1      0      0      0      0
## 2016-01-15      0      0      1      0      0      0      0      1      0      0
```

3) 분석 확장

위의 데이터셋을 늘려 오랜 기간 동안 keyword 를 분석하여 행렬로 만들어 advice2.csv 에 저장한 데이터로 분석을 수행한다.

```
advice2 <- read.csv("data/advice2.csv" , header = T , stringsAsFactors = F)
rownames(advice2) <- advice2[,1]
advice2
```

```
##      DATE 교환 포장 TV 고등어 곰팡이 구두 노트북 라면 초밥
## 2016-01-10 2016-01-10      0      0      2      30      13      5      4      4      20
## 2016-01-11 2016-01-11     19     12     13     52     12      1     10      0     60
## 2016-01-12 2016-01-12     18      7     16     32     20      9     16     20     34
## 2016-01-13 2016-01-13      1      4      3     40      2      7     14     15     34
## 2016-01-14 2016-01-14      6      0     19     52      0      1     11     12     22
## 2016-01-15 2016-01-15      1      8     12     32      1      3      6     13     50
## 2016-01-16 2016-01-16      8     16     16     51      0     13     15     18     30
## 2016-01-17 2016-01-17     10     17     11     39     10      5     18     14     25
## 2016-01-18 2016-01-18      6     19     16     25      5     20      5     19     23
## 2016-01-19 2016-01-19      5     13      0     53     12     13      3     19     37
## 2016-01-20 2016-01-20      6     14     20     43     18      2      8     19     29
## 2016-01-21 2016-01-21      8     15     11     42     18     17      7     11     50
## 2016-01-22 2016-01-22      8      7      4     54     17      0      4     12     44
## 2016-01-23 2016-01-23      8      7     18     35      2     19      6     14     49
```

##	2016-01-24	2016-01-24	18	14	9	42	14	4	15	15	31
##	2016-01-25	2016-01-25	15	6	3	40	1	19	6	11	53
##	2016-01-26	2016-01-26	4	18	6	37	9	14	2	9	42
##	2016-01-27	2016-01-27	7	7	9	46	14	12	9	6	49
##	2016-01-28	2016-01-28	1	13	7	49	19	16	17	2	58
##	2016-01-29	2016-01-29	17	11	15	43	4	1	0	12	52
##	2016-01-30	2016-01-30	2	18	9	59	10	2	1	5	37
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##		스팸	연어	신사복	카페	식당	운동복	핸드폰	프린터	세탁기	탁자
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## 2016-09-01	20	1	51	6	13	48	12	6	9	15
## 2016-09-02	19	4	41	9	17	49	3	5	5	15
## 2016-09-03	8	10	60	14	15	43	13	6	15	19
## 2016-09-04	16	17	30	5	3	25	18	8	0	10
## 2016-09-05	3	13	35	8	9	48	8	16	9	7
## 2016-09-06	6	8	45	5	4	49	4	1	19	1

## 2016-09-07	2	4	55	19	6	58	5	11	5	16
## 2016-09-08	19	1	43	12	1	31	6	7	15	5
## 2016-09-09	10	17	29	4	3	45	1	13	12	4
## 2016-09-10	6	16	25	14	5	22	13	3	16	13
## 2016-09-11	7	0	48	19	10	45	0	10	3	1
## 2016-09-12	18	8	53	11	2	48	7	12	16	19
## 2016-09-13	9	19	30	3	12	55	9	5	20	13
## 2016-09-14	14	4	60	11	2	60	1	0	1	6
## 2016-09-15	15	19	52	17	12	45	19	10	20	4
## 2016-09-16	6	4	16	9	2	1	14	18	27	60
## 2016-09-17	7	10	19	18	3	7	2	6	46	23
## 2016-09-18	13	14	4	3	1	16	4	9	47	47
## 2016-09-19	18	0	5	13	15	8	5	5	31	37
## 2016-09-20	5	0	0	1	3	20	14	0	30	35
## 2016-09-21	5	3	2	19	10	5	11	8	55	36
## 2016-09-22	14	11	14	16	10	7	13	11	36	32
## 2016-09-23	1	20	18	14	13	3	9	0	40	54
## 2016-09-24	9	14	3	17	5	20	5	2	34	27
## 2016-09-25	7	3	19	20	5	6	17	12	48	20
## 2016-09-26	5	5	0	19	15	6	10	18	20	25
## 2016-09-27	8	9	16	0	1	1	15	18	53	55
## 2016-09-28	5	4	16	14	14	20	8	8	25	36
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## 2016-09-30	0	18	18	5	8	8	15	1	54	21
## 2016-10-01	18	17	3	4	2	15	13	8	50	35
## 2016-10-02	5	10	19	11	1	11	0	17	55	54
## 2016-10-03	9	12	5	9	4	16	17	12	29	26
## 2016-10-04	0	16	15	1	7	5	8	1	25	35
## 2016-10-05	0	7	7	4	16	18	1	14	32	40
## 2016-10-06	11	7	15	19	5	8	17	17	46	48
## 2016-10-07	16	2	14	11	11	1	10	8	60	40
## 2016-10-08	11	5	11	3	4	1	1	5	29	56
## 2016-10-09	13	3	10	7	9	19	10	6	34	52
## 2016-10-10	9	11	11	8	7	15	11	11	54	50
## 2016-10-11	19	16	8	3	5	20	17	5	27	58
## 2016-10-12	16	6	1	19	13	8	7	4	57	57
## 2016-10-13	16	0	8	10	18	9	19	15	51	20
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## 2016-10-15	16	13	17	11	19	11	7	6	29	35
## 2016-10-16	16	12	16	15	4	19	3	5	55	54
## 2016-10-17	1	4	11	7	12	14	13	10	23	38
## 2016-10-18	10	11	5	7	20	0	20	1	56	38
## 2016-10-19	17	4	19	14	2	4	5	10	30	54
## 2016-10-20	3	7	0	15	3	12	2	12	43	44
## 2016-10-21	11	14	16	6	7	13	5	3	33	45
## 2016-10-22	9	8	19	10	1	11	2	13	40	40
## 2016-10-23	4	9	16	15	8	20	18	5	20	36
## 2016-10-24	2	7	2	15	7	11	8	4	28	46
## 2016-10-25	12	16	9	5	3	15	11	5	43	43

## 2016-10-26	11	7	7	7	10	13	11	10	51	28
## 2016-10-27	14	13	14	17	13	6	10	10	28	26
## 2016-10-28	4	8	19	8	2	6	6	1	47	36
## 2016-10-29	19	15	11	1	5	7	14	11	32	25
## 2016-10-30	3	13	0	0	9	20	6	14	22	41
## 2016-10-31	3	12	15	4	20	1	18	9	39	49
## 2016-11-01	2	0	14	8	9	4	18	14	20	58
## 2016-11-02	16	4	10	12	19	10	13	9	41	32
## 2016-11-03	14	15	1	7	2	3	19	4	43	47
## 2016-11-04	2	1	4	20	15	8	0	17	28	44
## 2016-11-05	20	18	7	6	9	2	1	1	40	36
## 2016-11-06	1	13	16	8	6	5	13	15	41	58
## 2016-11-07	14	14	7	11	18	16	6	0	29	41
## 2016-11-08	3	11	8	16	2	3	1	8	33	56
## 2016-11-09	11	2	8	12	11	20	9	0	54	22
## 2016-11-10	10	16	13	20	11	9	0	15	58	50
## 2016-11-11	10	9	13	7	3	16	2	18	47	29
## 2016-11-12	0	20	2	15	4	9	9	12	47	54
## 2016-11-13	20	16	3	19	5	2	14	3	60	20
## 2016-11-14	0	12	13	13	10	11	10	12	22	38

장릉

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## 2016-01-11	15
## 2016-01-12	8
## 2016-01-13	8
## 2016-01-14	19
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## 2016-01-16	15
## 2016-01-17	1
## 2016-01-18	1
## 2016-01-19	14
## 2016-01-20	12
## 2016-01-21	5
## 2016-01-22	19
## 2016-01-23	12
## 2016-01-24	17
## 2016-01-25	9
## 2016-01-26	14
## 2016-01-27	20
## 2016-01-28	2
## 2016-01-29	15
## 2016-01-30	17
## 2016-01-31	8
## 2016-02-01	11
## 2016-02-02	2
## 2016-02-03	5
## 2016-02-04	7
## 2016-02-05	10

##	2016-02-06	12
##	2016-02-07	6
##	2016-02-08	14
##	2016-02-09	4
##	2016-02-10	5
##	2016-02-11	1
##	2016-02-12	14
##	2016-02-13	12
##	2016-02-14	1
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##	2016-02-16	16
##	2016-02-17	14
##	2016-02-18	11
##	2016-02-19	17
##	2016-02-20	2
##	2016-02-21	15
##	2016-02-22	19
##	2016-02-23	2
##	2016-02-24	12
##	2016-02-25	8
##	2016-02-26	0
##	2016-02-27	13
##	2016-02-28	18
##	2016-02-29	2
##	2016-03-01	14
##	2016-03-02	16
##	2016-03-03	5
##	2016-03-04	15
##	2016-03-05	18
##	2016-03-06	14
##	2016-03-07	20
##	2016-03-08	8
##	2016-03-09	15
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##	2016-03-12	10
##	2016-03-13	3
##	2016-03-14	2
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##	2016-03-17	17
##	2016-03-18	7
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##	2016-03-20	10
##	2016-03-21	17
##	2016-03-22	14
##	2016-03-23	14
##	2016-03-24	0
##	2016-03-25	1

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##	2016-03-27	11
##	2016-03-28	0
##	2016-03-29	0
##	2016-03-30	19
##	2016-03-31	3
##	2016-04-01	16
##	2016-04-02	15
##	2016-04-03	5
##	2016-04-04	15
##	2016-04-05	15
##	2016-04-06	8
##	2016-04-07	12
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##	2016-04-09	16
##	2016-04-10	11
##	2016-04-11	2
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##	2016-04-13	19
##	2016-04-14	8
##	2016-04-15	12
##	2016-04-16	4
##	2016-04-17	15
##	2016-04-18	5
##	2016-04-19	8
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##	2016-04-21	7
##	2016-04-22	20
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##	2016-04-25	18
##	2016-04-26	15
##	2016-04-27	13
##	2016-04-28	13
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##	2016-05-02	10
##	2016-05-03	14
##	2016-05-04	12
##	2016-05-05	12
##	2016-05-06	19
##	2016-05-07	12
##	2016-05-08	5
##	2016-05-09	17
##	2016-05-10	16
##	2016-05-11	2
##	2016-05-12	1
##	2016-05-13	0

##	2016-05-14	20
##	2016-05-15	11
##	2016-05-16	3
##	2016-05-17	11
##	2016-05-18	3
##	2016-05-19	4
##	2016-05-20	14
##	2016-05-21	15
##	2016-05-22	20
##	2016-05-23	5
##	2016-05-24	7
##	2016-05-25	7
##	2016-05-26	9
##	2016-05-27	20
##	2016-05-28	11
##	2016-05-29	8
##	2016-05-30	14
##	2016-05-31	16
##	2016-06-01	18
##	2016-06-02	10
##	2016-06-03	10
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##	2016-06-08	10
##	2016-06-09	19
##	2016-06-10	17
##	2016-06-11	15
##	2016-06-12	4
##	2016-06-13	20
##	2016-06-14	20
##	2016-06-15	10
##	2016-06-16	19
##	2016-06-17	11
##	2016-06-18	3
##	2016-06-19	5
##	2016-06-20	12
##	2016-06-21	16
##	2016-06-22	9
##	2016-06-23	2
##	2016-06-24	20
##	2016-06-25	2
##	2016-06-26	13
##	2016-06-27	9
##	2016-06-28	14
##	2016-06-29	6
##	2016-06-30	15
##	2016-07-01	19

##	2016-07-02	13
##	2016-07-03	12
##	2016-07-04	6
##	2016-07-05	2
##	2016-07-06	10
##	2016-07-07	20
##	2016-07-08	14
##	2016-07-09	2
##	2016-07-10	0
##	2016-07-11	12
##	2016-07-12	8
##	2016-07-13	5
##	2016-07-14	1
##	2016-07-15	7
##	2016-07-16	16
##	2016-07-17	4
##	2016-07-18	11
##	2016-07-19	6
##	2016-07-20	17
##	2016-07-21	6
##	2016-07-22	0
##	2016-07-23	8
##	2016-07-24	1
##	2016-07-25	2
##	2016-07-26	19
##	2016-07-27	3
##	2016-07-28	14
##	2016-07-29	15
##	2016-07-30	14
##	2016-07-31	18
##	2016-08-01	4
##	2016-08-02	12
##	2016-08-03	1
##	2016-08-04	6
##	2016-08-05	18
##	2016-08-06	8
##	2016-08-07	6
##	2016-08-08	13
##	2016-08-09	15
##	2016-08-10	0
##	2016-08-11	7
##	2016-08-12	19
##	2016-08-13	13
##	2016-08-14	7
##	2016-08-15	15
##	2016-08-16	5
##	2016-08-17	9
##	2016-08-18	1
##	2016-08-19	1

##	2016-08-20	17
##	2016-08-21	10
##	2016-08-22	20
##	2016-08-23	4
##	2016-08-24	17
##	2016-08-25	20
##	2016-08-26	1
##	2016-08-27	10
##	2016-08-28	0
##	2016-08-29	13
##	2016-08-30	7
##	2016-08-31	18
##	2016-09-01	14
##	2016-09-02	2
##	2016-09-03	0
##	2016-09-04	2
##	2016-09-05	10
##	2016-09-06	8
##	2016-09-07	12
##	2016-09-08	6
##	2016-09-09	15
##	2016-09-10	18
##	2016-09-11	6
##	2016-09-12	8
##	2016-09-13	20
##	2016-09-14	6
##	2016-09-15	4
##	2016-09-16	25
##	2016-09-17	42
##	2016-09-18	35
##	2016-09-19	20
##	2016-09-20	41
##	2016-09-21	26
##	2016-09-22	44
##	2016-09-23	55
##	2016-09-24	53
##	2016-09-25	48
##	2016-09-26	38
##	2016-09-27	42
##	2016-09-28	45
##	2016-09-29	40
##	2016-09-30	21
##	2016-10-01	35
##	2016-10-02	20
##	2016-10-03	29
##	2016-10-04	46
##	2016-10-05	33
##	2016-10-06	51
##	2016-10-07	58

```
## 2016-10-08 37
## 2016-10-09 35
## 2016-10-10 28
## 2016-10-11 24
## 2016-10-12 34
## 2016-10-13 40
## 2016-10-14 40
## 2016-10-15 38
## 2016-10-16 40
## 2016-10-17 21
## 2016-10-18 20
## 2016-10-19 22
## 2016-10-20 33
## 2016-10-21 33
## 2016-10-22 31
## 2016-10-23 36
## 2016-10-24 27
## 2016-10-25 33
## 2016-10-26 47
## 2016-10-27 42
## 2016-10-28 30
## 2016-10-29 22
## 2016-10-30 46
## 2016-10-31 41
## 2016-11-01 37
## 2016-11-02 23
## 2016-11-03 52
## 2016-11-04 29
## 2016-11-05 32
## 2016-11-06 59
## 2016-11-07 20
## 2016-11-08 45
## 2016-11-09 58
## 2016-11-10 47
## 2016-11-11 26
## 2016-11-12 49
## 2016-11-13 20
## 2016-11-14 27
```

```
advice2 <- advice2[-1]
advice2
```

```
##          교환 포장 TV 고등어 곰팡이 구두 노트북 라면 초밥 스팸 연어
## 2016-01-10    0    0  2    30    13    5      4    4   20    3   38
## 2016-01-11   19   12 13    52    12    1     10    0   60    8   34
## 2016-01-12   18    7 16    32    20    9     16   20   34    4   43
## 2016-01-13    1    4  3    40     2    7     14   15   34    1   34
## 2016-01-14    6    0 19    52     0    1     11   12   22   11   24
## 2016-01-15    1    8 12    32     1    3      6   13   50   11   45
```

## 2016-01-16	8	16	16	51	0	13	15	18	30	6	32
## 2016-01-17	10	17	11	39	10	5	18	14	25	5	40
## 2016-01-18	6	19	16	25	5	20	5	19	23	2	45
## 2016-01-19	5	13	0	53	12	13	3	19	37	2	27
## 2016-01-20	6	14	20	43	18	2	8	19	29	4	21
## 2016-01-21	8	15	11	42	18	17	7	11	50	11	42
## 2016-01-22	8	7	4	54	17	0	4	12	44	8	44
## 2016-01-23	8	7	18	35	2	19	6	14	49	0	33
## 2016-01-24	18	14	9	42	14	4	15	15	31	0	46
## 2016-01-25	15	6	3	40	1	19	6	11	53	6	40
## 2016-01-26	4	18	6	37	9	14	2	9	42	18	44
## 2016-01-27	7	7	9	46	14	12	9	6	49	17	25
## 2016-01-28	1	13	7	49	19	16	17	2	58	18	49
## 2016-01-29	17	11	15	43	4	1	0	12	52	8	28
## 2016-01-30	2	18	9	59	10	2	1	5	37	1	58
## 2016-01-31	20	10	7	27	4	4	19	0	46	10	28
## 2016-02-01	18	13	14	37	14	6	19	13	28	5	48
## 2016-02-02	1	3	14	43	5	11	19	3	39	13	37
## 2016-02-03	16	15	0	49	14	6	9	2	30	17	22
## 2016-02-04	7	16	17	47	2	14	7	19	45	2	28
## 2016-02-05	14	13	4	27	12	19	10	18	35	16	47
## 2016-02-06	11	17	11	60	14	16	0	12	56	12	20
## 2016-02-07	11	13	3	58	19	6	6	17	24	19	37
## 2016-02-08	4	15	17	31	9	3	5	6	24	4	30
## 2016-02-09	14	3	9	40	8	16	1	0	52	2	45
## 2016-02-10	12	6	14	27	15	2	4	3	33	16	42
## 2016-02-11	19	14	19	28	17	4	15	12	55	11	45
## 2016-02-12	9	8	2	46	13	1	13	17	23	4	39
## 2016-02-13	14	13	8	46	1	11	0	1	29	10	29
## 2016-02-14	12	9	11	26	1	18	19	14	49	8	22
## 2016-02-15	20	2	2	42	6	10	15	7	49	20	37
## 2016-02-16	2	18	6	55	2	18	15	15	45	16	54
## 2016-02-17	14	20	1	23	14	12	19	5	49	8	29
## 2016-02-18	11	18	19	28	2	13	14	19	56	6	26
## 2016-02-19	5	15	12	30	19	5	17	20	34	0	44
## 2016-02-20	16	10	6	45	9	15	20	3	33	0	24
## 2016-02-21	18	12	15	30	18	5	1	7	42	17	35
## 2016-02-22	17	13	11	44	15	11	10	3	46	20	37
## 2016-02-23	16	0	1	39	16	5	11	4	59	12	41
## 2016-02-24	3	19	2	36	0	4	19	15	32	3	41
## 2016-02-25	19	0	11	37	17	9	9	3	54	15	36
## 2016-02-26	14	12	3	33	7	6	0	14	44	17	21
## 2016-02-27	3	13	2	57	5	9	13	3	49	16	60
## 2016-02-28	1	15	8	32	2	15	1	2	23	14	29
## 2016-02-29	10	14	9	48	2	14	20	13	52	5	26
## 2016-03-01	17	5	7	48	4	6	13	5	30	18	26
## 2016-03-02	11	11	16	38	18	1	19	17	22	6	21
## 2016-03-03	14	17	3	25	18	4	0	18	56	7	41
## 2016-03-04	17	7	8	22	7	13	6	6	40	16	56

## 2016-03-05	4	4	11	23	15	15	13	16	51	0	40
## 2016-03-06	18	11	0	44	7	4	19	11	48	11	34
## 2016-03-07	14	2	4	58	8	2	10	20	32	1	22
## 2016-03-08	1	16	15	22	6	14	7	12	31	5	56
## 2016-03-09	8	12	17	30	3	12	8	3	57	9	37
## 2016-03-10	16	16	19	59	7	3	12	0	53	12	46
## 2016-03-11	3	1	6	25	16	11	10	15	37	10	34
## 2016-03-12	1	5	1	30	16	19	7	4	34	5	35
## 2016-03-13	17	2	8	25	0	3	14	20	35	17	23
## 2016-03-14	14	11	17	20	10	20	9	19	38	16	58
## 2016-03-15	10	15	5	40	10	9	17	0	48	11	48
## 2016-03-16	1	18	9	31	20	9	15	3	55	15	55
## 2016-03-17	5	10	12	31	14	14	0	14	34	8	39
## 2016-03-18	20	2	2	38	11	8	2	5	38	10	60
## 2016-03-19	11	1	6	48	0	18	10	2	51	18	23
## 2016-03-20	19	14	11	38	11	9	16	14	57	7	53
## 2016-03-21	11	16	12	37	1	11	5	7	42	5	54
## 2016-03-22	7	17	6	35	6	9	8	17	31	8	24
## 2016-03-23	0	16	7	29	15	18	10	14	32	7	41
## 2016-03-24	11	6	0	33	14	6	7	15	44	4	44
## 2016-03-25	12	2	18	47	12	1	5	12	45	4	43
## 2016-03-26	9	7	3	37	4	19	1	12	50	19	27
## 2016-03-27	20	7	5	26	1	5	9	16	48	11	44
## 2016-03-28	14	18	6	25	17	8	6	4	26	17	60
## 2016-03-29	19	1	9	38	5	19	4	17	39	16	58
## 2016-03-30	5	11	18	44	7	7	9	12	26	9	22
## 2016-03-31	18	10	14	56	17	5	10	8	44	9	46
## 2016-04-01	16	17	1	53	5	12	7	6	22	6	47
## 2016-04-02	19	18	0	27	5	15	10	20	45	8	60
## 2016-04-03	13	5	0	27	4	5	7	12	24	3	34
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신사복 카페 식당 운동복 핸드폰 프린터 세탁기 탁자 장롱

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## 2016-03-03	10	8	17	3	3	2	14	12	5
## 2016-03-04	19	18	13	6	0	3	16	18	15
## 2016-03-05	3	10	15	6	2	19	5	1	18
## 2016-03-06	6	4	20	3	18	6	6	18	14
## 2016-03-07	19	12	6	17	17	7	13	4	20
## 2016-03-08	5	16	12	6	1	6	0	14	8
## 2016-03-09	11	6	15	4	0	15	6	12	15
## 2016-03-10	13	9	9	1	12	20	12	8	4
## 2016-03-11	2	20	2	11	6	1	12	4	2
## 2016-03-12	6	5	4	18	2	5	15	1	10
## 2016-03-13	18	19	18	2	8	3	10	10	3
## 2016-03-14	7	13	16	0	3	20	12	18	2
## 2016-03-15	5	5	14	4	15	13	15	20	7
## 2016-03-16	7	7	9	2	17	0	14	2	10
## 2016-03-17	12	8	12	3	14	12	11	7	17
## 2016-03-18	16	13	18	18	4	16	15	5	7
## 2016-03-19	6	19	7	19	20	19	1	5	7
## 2016-03-20	8	0	15	20	15	3	20	8	10
## 2016-03-21	18	5	5	15	7	10	2	17	17
## 2016-03-22	17	4	8	19	2	18	14	17	14
## 2016-03-23	14	16	9	18	2	20	6	12	14
## 2016-03-24	2	11	20	19	13	0	20	4	0
## 2016-03-25	7	8	10	4	9	1	13	6	1
## 2016-03-26	10	9	14	10	9	5	0	17	2
## 2016-03-27	10	13	4	19	6	1	8	14	11
## 2016-03-28	1	20	12	5	19	18	9	4	0
## 2016-03-29	11	17	12	11	19	5	9	9	0
## 2016-03-30	6	15	14	13	4	4	9	20	19
## 2016-03-31	6	12	19	1	15	19	7	14	3
## 2016-04-01	15	1	14	20	8	7	14	17	16
## 2016-04-02	11	11	5	2	18	11	9	2	15
## 2016-04-03	17	17	9	4	6	16	16	3	5
## 2016-04-04	4	13	18	12	20	17	5	0	15

## 2016-04-05	20	11	16	16	13	10	12	6	15
## 2016-04-06	8	8	14	15	3	1	6	5	8
## 2016-04-07	12	9	12	10	4	10	9	13	12
## 2016-04-08	15	19	10	16	17	7	17	7	11
## 2016-04-09	20	7	3	18	17	1	14	10	16
## 2016-04-10	10	18	0	19	12	13	4	4	11
## 2016-04-11	8	9	6	10	16	0	18	20	2
## 2016-04-12	7	7	0	0	10	0	1	3	15
## 2016-04-13	17	11	3	4	5	19	14	16	19
## 2016-04-14	2	0	5	2	3	3	20	0	8
## 2016-04-15	8	12	18	18	18	8	16	2	12
## 2016-04-16	10	6	3	2	16	20	18	15	4
## 2016-04-17	14	20	7	4	18	10	10	19	15
## 2016-04-18	5	13	7	10	5	0	18	11	5
## 2016-04-19	1	2	17	11	45	30	6	3	8
## 2016-04-20	16	18	1	3	34	51	17	7	14
## 2016-04-21	18	5	8	20	55	35	16	0	7
## 2016-04-22	0	9	11	10	51	44	3	17	20
## 2016-04-23	19	17	0	0	52	28	20	4	2
## 2016-04-24	5	12	11	18	52	23	9	14	11
## 2016-04-25	2	18	2	6	51	46	19	14	18
## 2016-04-26	12	17	9	14	45	35	1	1	15
## 2016-04-27	12	5	20	14	20	50	18	0	13
## 2016-04-28	7	7	3	6	52	42	9	20	13
## 2016-04-29	0	18	2	7	57	24	16	20	1
## 2016-04-30	6	11	18	7	56	44	0	19	9
## 2016-05-01	3	4	20	0	44	32	19	16	5
## 2016-05-02	1	11	16	7	55	26	10	14	10
## 2016-05-03	19	20	14	19	23	37	16	5	14
## 2016-05-04	15	14	16	19	56	46	6	19	12
## 2016-05-05	19	7	11	4	47	60	17	3	12
## 2016-05-06	4	9	10	0	57	23	14	10	19
## 2016-05-07	6	5	18	13	53	39	5	18	12
## 2016-05-08	5	8	4	10	21	28	4	18	5
## 2016-05-09	7	18	17	3	49	48	3	10	17
## 2016-05-10	16	7	1	20	47	38	14	19	16
## 2016-05-11	16	2	14	1	56	35	12	9	2
## 2016-05-12	0	19	12	9	32	57	7	4	1
## 2016-05-13	1	0	16	13	52	45	12	10	0
## 2016-05-14	9	12	8	14	35	34	20	15	20
## 2016-05-15	11	8	3	5	36	42	7	6	11
## 2016-05-16	4	2	1	4	48	39	19	16	3
## 2016-05-17	4	12	15	20	35	22	19	15	11
## 2016-05-18	1	11	15	7	52	59	14	2	3
## 2016-05-19	4	13	5	19	50	46	11	0	4
## 2016-05-20	15	18	16	17	50	26	9	4	14
## 2016-05-21	19	2	19	5	34	22	11	12	15
## 2016-05-22	1	1	3	20	47	28	2	3	20
## 2016-05-23	14	14	3	15	26	59	18	18	5

## 2016-05-24	4	2	9	1	20	49	7	10	7
## 2016-05-25	19	7	8	1	27	25	12	6	7
## 2016-05-26	5	2	6	8	54	33	17	16	9
## 2016-05-27	4	5	3	13	52	51	20	7	20
## 2016-05-28	18	15	11	5	27	30	14	15	11
## 2016-05-29	19	13	10	2	22	40	16	13	8
## 2016-05-30	9	18	15	17	24	39	3	3	14
## 2016-05-31	10	11	15	2	28	40	8	1	16
## 2016-06-01	2	16	9	16	49	33	14	4	18
## 2016-06-02	7	17	15	0	57	46	18	9	10
## 2016-06-03	10	11	1	17	25	31	10	1	10
## 2016-06-04	18	11	6	3	32	22	0	20	17
## 2016-06-05	0	11	6	14	30	36	5	0	8
## 2016-06-06	8	10	18	4	40	53	5	4	11
## 2016-06-07	17	5	5	12	32	58	11	15	18
## 2016-06-08	3	0	9	9	27	45	7	13	10
## 2016-06-09	1	9	16	14	47	36	5	6	19
## 2016-06-10	4	13	17	16	38	21	12	4	17
## 2016-06-11	18	3	13	3	30	31	3	3	15
## 2016-06-12	16	17	5	3	57	28	2	13	4
## 2016-06-13	17	12	18	2	57	39	1	14	20
## 2016-06-14	14	9	0	19	37	57	10	2	20
## 2016-06-15	12	19	10	9	33	50	15	8	10
## 2016-06-16	13	17	6	0	20	58	4	12	19
## 2016-06-17	4	0	10	13	42	36	16	5	11
## 2016-06-18	5	10	8	1	27	47	12	1	3
## 2016-06-19	2	17	10	8	48	30	8	5	5
## 2016-06-20	6	2	0	8	38	54	15	19	12
## 2016-06-21	12	11	9	20	43	34	2	5	16
## 2016-06-22	17	1	19	1	36	32	14	7	9
## 2016-06-23	14	9	13	0	32	55	11	4	2
## 2016-06-24	16	4	4	6	40	40	13	11	20
## 2016-06-25	4	3	11	8	32	25	0	16	2
## 2016-06-26	9	19	8	1	28	34	4	14	13
## 2016-06-27	4	6	12	15	57	30	19	8	9
## 2016-06-28	15	20	1	1	24	59	18	11	14
## 2016-06-29	9	8	6	5	51	22	11	3	6
## 2016-06-30	9	17	7	6	22	28	15	11	15
## 2016-07-01	18	18	0	19	52	22	0	19	19
## 2016-07-02	17	7	5	11	50	23	10	9	13
## 2016-07-03	1	4	1	13	36	41	14	12	12
## 2016-07-04	19	3	16	5	52	39	2	3	6
## 2016-07-05	16	8	10	4	30	29	6	13	2
## 2016-07-06	18	5	7	18	25	47	20	0	10
## 2016-07-07	13	0	12	20	49	34	6	5	20
## 2016-07-08	10	6	15	0	35	27	12	2	14
## 2016-07-09	1	6	8	17	41	53	11	9	2
## 2016-07-10	20	6	16	9	27	26	2	13	0
## 2016-07-11	8	20	6	20	34	60	17	16	12

## 2016-07-12	10	16	13	20	38	47	15	14	8
## 2016-07-13	13	16	8	0	58	31	5	1	5
## 2016-07-14	2	15	1	1	34	52	13	20	1
## 2016-07-15	11	5	5	18	43	42	18	11	7
## 2016-07-16	20	4	6	17	24	32	12	18	16
## 2016-07-17	4	17	11	15	38	53	6	2	4
## 2016-07-18	6	0	2	9	54	58	4	18	11
## 2016-07-19	5	9	9	9	57	34	0	14	6
## 2016-07-20	19	1	8	3	37	24	5	13	17
## 2016-07-21	13	18	11	2	45	24	1	7	6
## 2016-07-22	19	18	15	8	52	47	7	11	0
## 2016-07-23	8	9	4	16	23	29	2	20	8
## 2016-07-24	2	3	10	19	42	45	7	1	1
## 2016-07-25	10	20	6	12	28	43	5	2	2
## 2016-07-26	6	19	17	13	30	51	8	7	19
## 2016-07-27	0	13	16	18	48	50	14	1	3
## 2016-07-28	29	6	15	37	8	14	16	6	14
## 2016-07-29	48	1	7	25	20	19	14	20	15
## 2016-07-30	22	12	20	60	16	13	7	14	14
## 2016-07-31	33	6	9	35	10	3	3	10	18
## 2016-08-01	39	7	9	36	5	7	5	3	4
## 2016-08-02	43	13	9	27	18	15	8	8	12
## 2016-08-03	36	9	3	56	16	4	19	13	1
## 2016-08-04	23	16	8	33	12	3	13	15	6
## 2016-08-05	57	7	16	41	4	20	0	13	18
## 2016-08-06	37	14	13	34	5	3	8	3	8
## 2016-08-07	36	20	19	52	11	19	20	12	6
## 2016-08-08	28	1	19	36	16	7	1	16	13
## 2016-08-09	36	12	4	38	17	14	11	8	15
## 2016-08-10	30	19	11	25	1	12	18	3	0
## 2016-08-11	60	9	12	59	10	1	17	14	7
## 2016-08-12	39	5	13	47	8	5	9	18	19
## 2016-08-13	20	17	4	45	4	11	12	15	13
## 2016-08-14	59	1	12	42	4	3	14	2	7
## 2016-08-15	36	4	11	45	12	8	12	15	15
## 2016-08-16	48	6	9	54	5	2	3	5	5
## 2016-08-17	23	12	9	57	20	5	5	15	9
## 2016-08-18	57	2	18	32	19	10	15	12	1
## 2016-08-19	53	2	9	30	3	7	16	5	1
## 2016-08-20	22	9	13	22	3	5	5	12	17
## 2016-08-21	58	9	4	21	9	18	15	0	10
## 2016-08-22	20	10	2	22	6	8	11	7	20
## 2016-08-23	49	13	0	31	13	15	17	6	4
## 2016-08-24	40	14	2	42	0	5	4	20	17
## 2016-08-25	41	15	5	25	19	19	3	14	20
## 2016-08-26	34	19	12	23	6	8	7	5	1
## 2016-08-27	36	19	5	57	0	18	9	8	10
## 2016-08-28	21	17	1	32	12	18	12	11	0
## 2016-08-29	24	10	1	31	2	9	16	8	13

## 2016-08-30	54	9	16	35	19	0	7	15	7
## 2016-08-31	40	2	19	54	11	17	9	9	18
## 2016-09-01	51	6	13	48	12	6	9	15	14
## 2016-09-02	41	9	17	49	3	5	5	15	2
## 2016-09-03	60	14	15	43	13	6	15	19	0
## 2016-09-04	30	5	3	25	18	8	0	10	2
## 2016-09-05	35	8	9	48	8	16	9	7	10
## 2016-09-06	45	5	4	49	4	1	19	1	8
## 2016-09-07	55	19	6	58	5	11	5	16	12
## 2016-09-08	43	12	1	31	6	7	15	5	6
## 2016-09-09	29	4	3	45	1	13	12	4	15
## 2016-09-10	25	14	5	22	13	3	16	13	18
## 2016-09-11	48	19	10	45	0	10	3	1	6
## 2016-09-12	53	11	2	48	7	12	16	19	8
## 2016-09-13	30	3	12	55	9	5	20	13	20
## 2016-09-14	60	11	2	60	1	0	1	6	6
## 2016-09-15	52	17	12	45	19	10	20	4	4
## 2016-09-16	16	9	2	1	14	18	27	60	25
## 2016-09-17	19	18	3	7	2	6	46	23	42
## 2016-09-18	4	3	1	16	4	9	47	47	35
## 2016-09-19	5	13	15	8	5	5	31	37	20
## 2016-09-20	0	1	3	20	14	0	30	35	41
## 2016-09-21	2	19	10	5	11	8	55	36	26
## 2016-09-22	14	16	10	7	13	11	36	32	44
## 2016-09-23	18	14	13	3	9	0	40	54	55
## 2016-09-24	3	17	5	20	5	2	34	27	53
## 2016-09-25	19	20	5	6	17	12	48	20	48
## 2016-09-26	0	19	15	6	10	18	20	25	38
## 2016-09-27	16	0	1	1	15	18	53	55	42
## 2016-09-28	16	14	14	20	8	8	25	36	45
## 2016-09-29	11	4	2	13	11	2	31	33	40
## 2016-09-30	18	5	8	8	15	1	54	21	21
## 2016-10-01	3	4	2	15	13	8	50	35	35
## 2016-10-02	19	11	1	11	0	17	55	54	20
## 2016-10-03	5	9	4	16	17	12	29	26	29
## 2016-10-04	15	1	7	5	8	1	25	35	46
## 2016-10-05	7	4	16	18	1	14	32	40	33
## 2016-10-06	15	19	5	8	17	17	46	48	51
## 2016-10-07	14	11	11	1	10	8	60	40	58
## 2016-10-08	11	3	4	1	1	5	29	56	37
## 2016-10-09	10	7	9	19	10	6	34	52	35
## 2016-10-10	11	8	7	15	11	11	54	50	28
## 2016-10-11	8	3	5	20	17	5	27	58	24
## 2016-10-12	1	19	13	8	7	4	57	57	34
## 2016-10-13	8	10	18	9	19	15	51	20	40
## 2016-10-14	7	7	3	5	11	1	40	39	40
## 2016-10-15	17	11	19	11	7	6	29	35	38
## 2016-10-16	16	15	4	19	3	5	55	54	40
## 2016-10-17	11	7	12	14	13	10	23	38	21

```
## 2016-10-18      5      7     20      0     20      1     56     38     20
## 2016-10-19     19     14      2      4      5     10     30     54     22
## 2016-10-20      0     15      3     12      2     12     43     44     33
## 2016-10-21     16      6      7     13      5      3     33     45     33
## 2016-10-22     19     10      1     11      2     13     40     40     31
## 2016-10-23     16     15      8     20     18      5     20     36     36
## 2016-10-24      2     15      7     11      8      4     28     46     27
## 2016-10-25      9      5      3     15     11      5     43     43     33
## 2016-10-26      7      7     10     13     11     10     51     28     47
## 2016-10-27     14     17     13      6     10     10     28     26     42
## 2016-10-28     19      8      2      6      6      1     47     36     30
## 2016-10-29     11      1      5      7     14     11     32     25     22
## 2016-10-30      0      0      9     20      6     14     22     41     46
## 2016-10-31     15      4     20      1     18      9     39     49     41
## 2016-11-01     14      8      9      4     18     14     20     58     37
## 2016-11-02     10     12     19     10     13      9     41     32     23
## 2016-11-03      1      7      2      3     19      4     43     47     52
## 2016-11-04      4     20     15      8      0     17     28     44     29
## 2016-11-05      7      6      9      2      1      1     40     36     32
## 2016-11-06     16      8      6      5     13     15     41     58     59
## 2016-11-07      7     11     18     16      6      0     29     41     20
## 2016-11-08      8     16      2      3      1      8     33     56     45
## 2016-11-09      8     12     11     20      9      0     54     22     58
## 2016-11-10     13     20     11      9      0     15     58     50     47
## 2016-11-11     13      7      3     16      2     18     47     29     26
## 2016-11-12      2     15      4      9      9     12     47     54     49
## 2016-11-13      3     19      5      2     14      3     60     20     20
## 2016-11-14     13     13     10     11     10     12     22     38     27
```

```
advice3 <- ifelse(advice2 > mean(apply(advice2, 2 , mean)) , 1 , 0) #frequency
가 평균 이하인 keyword 는 0 으로 처리
advice3
```

```
##              교환 포장 TV 고등어 곰팡이 구두 노트북 라면 초밥 스팸 연어
## 2016-01-10      0      0  0      1      0      0      0      0      1      0      1
## 2016-01-11      1      0  0      1      0      0      0      0      1      0      1
## 2016-01-12      1      0  1      1      1      0      1      1      1      0      1
## 2016-01-13      0      0  0      1      0      0      0      1      1      0      1
## 2016-01-14      0      0  1      1      0      0      0      0      1      0      1
## 2016-01-15      0      0  0      1      0      0      0      0      1      0      1
## 2016-01-16      0      1  1      1      0      0      1      1      1      0      1
## 2016-01-17      0      1  0      1      0      0      1      0      1      0      1
## 2016-01-18      0      1  1      1      0      1      0      1      1      0      1
## 2016-01-19      0      0  0      1      0      0      0      1      1      0      1
## 2016-01-20      0      0  1      1      1      0      0      1      1      0      1
## 2016-01-21      0      1  0      1      1      1      0      0      1      0      1
## 2016-01-22      0      0  0      1      1      0      0      0      1      0      1
## 2016-01-23      0      0  1      1      0      1      0      0      1      0      1
```

## 2016-01-24	1	0	0	1	0	0	1	1	1	0	1
## 2016-01-25	1	0	0	1	0	1	0	0	1	0	1
## 2016-01-26	0	1	0	1	0	0	0	0	1	1	1
## 2016-01-27	0	0	0	1	0	0	0	0	1	1	1
## 2016-01-28	0	0	0	1	1	1	1	0	1	1	1
## 2016-01-29	1	0	1	1	0	0	0	0	1	0	1
## 2016-01-30	0	1	0	1	0	0	0	0	1	0	1
## 2016-01-31	1	0	0	1	0	0	1	0	1	0	1
## 2016-02-01	1	0	0	1	0	0	1	0	1	0	1
## 2016-02-02	0	0	0	1	0	0	1	0	1	0	1
## 2016-02-03	1	1	0	1	0	0	0	0	1	1	1
## 2016-02-04	0	1	1	1	0	0	0	1	1	0	1
## 2016-02-05	0	0	0	1	0	1	0	1	1	1	1
## 2016-02-06	0	1	0	1	0	1	0	0	1	0	1
## 2016-02-07	0	0	0	1	1	0	0	1	1	1	1
## 2016-02-08	0	1	1	1	0	0	0	0	1	0	1
## 2016-02-09	0	0	0	1	0	1	0	0	1	0	1
## 2016-02-10	0	0	0	1	1	0	0	0	1	1	1
## 2016-02-11	1	0	1	1	1	0	1	0	1	0	1
## 2016-02-12	0	0	0	1	0	0	0	1	1	0	1
## 2016-02-13	0	0	0	1	0	0	0	0	1	0	1
## 2016-02-14	0	0	0	1	0	1	1	0	1	0	1
## 2016-02-15	1	0	0	1	0	0	1	0	1	1	1
## 2016-02-16	0	1	0	1	0	1	1	1	1	1	1
## 2016-02-17	0	1	0	1	0	0	1	0	1	0	1
## 2016-02-18	0	1	1	1	0	0	0	1	1	0	1
## 2016-02-19	0	1	0	1	1	0	1	1	1	0	1
## 2016-02-20	1	0	0	1	0	1	1	0	1	0	1
## 2016-02-21	1	0	1	1	1	0	0	0	1	1	1
## 2016-02-22	1	0	0	1	1	0	0	0	1	1	1
## 2016-02-23	1	0	0	1	1	0	0	0	1	0	1
## 2016-02-24	0	1	0	1	0	0	1	1	1	0	1
## 2016-02-25	1	0	0	1	1	0	0	0	1	1	1
## 2016-02-26	0	0	0	1	0	0	0	0	1	1	1
## 2016-02-27	0	0	0	1	0	0	0	0	1	1	1
## 2016-02-28	0	1	0	1	0	1	0	0	1	0	1
## 2016-02-29	0	0	0	1	0	0	1	0	1	0	1
## 2016-03-01	1	0	0	1	0	0	0	0	1	1	1
## 2016-03-02	0	0	1	1	1	0	1	1	1	0	1
## 2016-03-03	0	1	0	1	1	0	0	1	1	0	1
## 2016-03-04	1	0	0	1	0	0	0	0	1	1	1
## 2016-03-05	0	0	0	1	1	1	0	1	1	0	1
## 2016-03-06	1	0	0	1	0	0	1	0	1	0	1
## 2016-03-07	0	0	0	1	0	0	0	1	1	0	1
## 2016-03-08	0	1	1	1	0	0	0	0	1	0	1
## 2016-03-09	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-10	1	1	1	1	0	0	0	0	1	0	1
## 2016-03-11	0	0	0	1	1	0	0	1	1	0	1
## 2016-03-12	0	0	0	1	1	1	0	0	1	0	1

## 2016-03-13	1	0	0	1	0	0	0	1	1	1	1
## 2016-03-14	0	0	1	1	0	1	0	1	1	1	1
## 2016-03-15	0	1	0	1	0	0	1	0	1	0	1
## 2016-03-16	0	1	0	1	1	0	1	0	1	1	1
## 2016-03-17	0	0	0	1	0	0	0	0	1	0	1
## 2016-03-18	1	0	0	1	0	0	0	0	1	0	1
## 2016-03-19	0	0	0	1	0	1	0	0	1	1	1
## 2016-03-20	1	0	0	1	0	0	1	0	1	0	1
## 2016-03-21	0	1	0	1	0	0	0	0	1	0	1
## 2016-03-22	0	1	0	1	0	0	0	1	1	0	1
## 2016-03-23	0	1	0	1	1	1	0	0	1	0	1
## 2016-03-24	0	0	0	1	0	0	0	1	1	0	1
## 2016-03-25	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-26	0	0	0	1	0	1	0	0	1	1	1
## 2016-03-27	1	0	0	1	0	0	0	1	1	0	1
## 2016-03-28	0	1	0	1	1	0	0	0	1	1	1
## 2016-03-29	1	0	0	1	0	1	0	1	1	1	1
## 2016-03-30	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-31	1	0	0	1	1	0	0	0	1	0	1
## 2016-04-01	1	1	0	1	0	0	0	0	1	0	1
## 2016-04-02	1	1	0	1	0	1	0	1	1	0	1
## 2016-04-03	0	0	0	1	0	0	0	0	1	0	1
## 2016-04-04	0	1	1	1	0	1	1	0	1	0	1
## 2016-04-05	1	0	1	1	0	0	0	0	1	0	1
## 2016-04-06	1	0	1	1	0	0	1	0	1	1	1
## 2016-04-07	1	0	1	1	1	0	0	1	1	0	1
## 2016-04-08	1	0	0	1	1	1	0	0	1	0	1
## 2016-04-09	0	1	0	1	1	1	0	0	1	0	1
## 2016-04-10	1	0	0	1	1	0	0	0	1	0	1
## 2016-04-11	0	1	1	1	0	1	0	0	1	1	1
## 2016-04-12	0	0	0	1	0	0	1	1	1	0	1
## 2016-04-13	1	1	0	1	0	0	0	0	1	0	1
## 2016-04-14	1	1	0	1	0	0	0	0	1	1	1
## 2016-04-15	0	0	1	1	0	0	0	0	1	0	1
## 2016-04-16	1	1	0	1	0	0	0	1	1	0	1
## 2016-04-17	0	0	1	1	0	0	0	0	1	0	1
## 2016-04-18	0	0	0	1	0	0	0	0	1	1	1
## 2016-04-19	0	0	1	0	0	0	1	0	1	0	0
## 2016-04-20	0	0	1	0	1	0	1	0	0	0	0
## 2016-04-21	0	0	1	0	1	0	1	0	0	0	1
## 2016-04-22	1	0	1	0	1	0	1	0	1	1	1
## 2016-04-23	0	0	1	0	0	1	1	1	0	0	0
## 2016-04-24	1	0	1	0	0	0	1	0	0	0	1
## 2016-04-25	0	0	1	0	0	1	1	0	1	0	0
## 2016-04-26	0	0	1	1	0	1	1	0	1	0	0
## 2016-04-27	0	0	1	0	0	0	1	0	0	0	1
## 2016-04-28	1	1	1	0	0	0	1	1	0	0	0
## 2016-04-29	0	0	1	0	0	1	1	0	1	0	0
## 2016-04-30	1	0	1	1	0	0	1	0	0	0	0

## 2016-05-01	1	0	1	0	0	0	1	1	1	0	0
## 2016-05-02	1	1	1	0	0	1	1	0	0	1	1
## 2016-05-03	0	0	1	0	0	0	1	1	0	1	0
## 2016-05-04	1	0	1	0	0	1	1	1	0	1	0
## 2016-05-05	0	1	1	0	1	0	1	0	0	0	0
## 2016-05-06	1	1	1	0	1	0	1	0	0	0	0
## 2016-05-07	1	0	1	0	0	0	1	0	1	0	0
## 2016-05-08	1	1	1	1	1	0	1	0	0	0	0
## 2016-05-09	0	0	1	1	0	0	1	0	0	0	0
## 2016-05-10	0	0	1	0	0	0	1	0	0	1	0
## 2016-05-11	0	0	1	1	0	0	1	0	0	1	1
## 2016-05-12	0	0	1	1	1	1	1	0	0	0	0
## 2016-05-13	1	0	1	0	0	0	1	0	0	1	0
## 2016-05-14	1	0	1	0	0	0	1	1	0	0	0
## 2016-05-15	0	0	1	0	0	1	1	1	0	0	0
## 2016-05-16	0	0	1	0	0	0	1	0	1	1	0
## 2016-05-17	0	0	1	1	0	0	1	1	0	0	0
## 2016-05-18	0	0	1	1	0	0	1	1	0	0	1
## 2016-05-19	1	0	1	1	0	0	1	0	0	0	1
## 2016-05-20	0	1	1	1	0	1	1	0	0	0	0
## 2016-05-21	0	1	1	0	1	1	1	0	1	1	0
## 2016-05-22	0	0	1	0	0	0	1	0	0	0	0
## 2016-05-23	0	0	1	0	0	0	1	1	1	1	0
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## 2016-05-25	1	0	1	0	1	0	1	0	0	1	0
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## 2016-05-27	1	0	1	0	0	0	1	0	1	1	1
## 2016-05-28	1	0	1	0	0	1	1	1	0	0	1
## 2016-05-29	1	1	1	1	0	0	1	0	0	0	0
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## 2016-05-31	1	0	1	0	0	1	1	1	0	0	1
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## 2016-06-03	0	0	1	0	1	0	1	1	0	0	0
## 2016-06-04	1	0	1	1	0	0	1	1	0	0	1
## 2016-06-05	0	0	1	1	0	1	1	0	1	0	0
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## 2016-06-08	0	0	1	1	0	1	1	0	1	1	1
## 2016-06-09	0	0	1	0	1	1	1	0	0	1	0
## 2016-06-10	0	0	1	0	0	0	1	0	1	1	0
## 2016-06-11	0	0	1	0	0	0	1	1	1	1	0
## 2016-06-12	1	1	1	0	1	0	1	0	0	1	0
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## 2016-06-16	0	0	1	0	0	0	1	0	0	0	1
## 2016-06-17	0	1	1	0	0	0	1	1	0	0	0
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## 2016-06-19	0	0	1	0	0	0	1	0	0	0	1
## 2016-06-20	0	0	1	0	0	1	1	0	0	0	0
## 2016-06-21	0	1	1	0	0	0	1	0	0	0	1
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## 2016-06-29	0	1	1	0	0	0	1	1	1	1	0
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## 2016-07-01	0	0	1	0	1	1	1	0	0	0	0
## 2016-07-02	0	0	1	0	0	0	1	1	0	1	0
## 2016-07-03	0	1	1	0	1	1	1	0	1	0	1
## 2016-07-04	0	0	1	0	0	0	1	1	0	0	1
## 2016-07-05	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-06	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-07	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-08	1	0	1	0	0	1	1	0	0	0	1
## 2016-07-09	0	0	1	1	1	0	1	1	0	0	1
## 2016-07-10	0	1	1	0	0	0	1	0	1	0	0
## 2016-07-11	0	0	1	1	0	0	1	1	0	0	0
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## 2016-07-15	1	0	1	0	1	0	1	0	0	0	0
## 2016-07-16	1	0	1	0	0	1	1	1	0	0	1
## 2016-07-17	0	0	1	1	0	0	1	1	0	0	0
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## 2016-07-27	0	0	1	0	0	1	1	0	0	0	0
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## 2016-08-02	0	1	0	0	1	1	0	1	1	0	1
## 2016-08-03	0	1	1	0	0	1	1	0	1	0	0
## 2016-08-04	0	1	0	0	1	1	0	0	0	1	0
## 2016-08-05	1	0	0	0	0	1	0	0	0	0	0
## 2016-08-06	0	1	0	1	0	1	0	0	0	0	0

## 2016-08-07	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-08	0	0	1	1	1	1	0	0	0	1	0
## 2016-08-09	1	0	0	0	0	1	1	1	0	0	0
## 2016-08-10	0	0	0	0	0	1	0	0	0	0	1
## 2016-08-11	0	0	0	1	1	1	1	0	0	0	1
## 2016-08-12	1	0	0	0	0	1	0	0	0	0	1
## 2016-08-13	0	1	0	0	0	1	0	1	1	0	1
## 2016-08-14	0	0	0	0	0	1	0	0	0	1	1
## 2016-08-15	1	1	0	0	0	1	0	0	0	0	1
## 2016-08-16	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-17	0	0	0	0	0	1	0	0	0	1	1
## 2016-08-18	0	0	0	1	1	1	1	0	0	0	1
## 2016-08-19	0	0	0	0	1	1	0	0	0	0	0
## 2016-08-20	1	0	0	0	0	1	1	1	0	0	0
## 2016-08-21	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-22	1	0	0	0	1	1	1	0	0	0	0
## 2016-08-23	0	0	1	0	0	1	1	0	0	0	1
## 2016-08-24	1	0	0	0	1	1	0	0	0	0	1
## 2016-08-25	1	0	0	0	0	1	0	0	0	1	1
## 2016-08-26	0	1	0	0	0	1	1	0	0	0	0
## 2016-08-27	0	1	0	1	0	1	1	0	0	0	0
## 2016-08-28	0	1	1	1	0	1	1	0	0	0	0
## 2016-08-29	0	0	0	0	0	1	1	0	0	0	0
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## 2016-08-31	1	0	0	0	1	1	0	1	0	0	0
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## 2016-09-02	0	0	0	1	0	1	0	1	0	1	0
## 2016-09-03	0	0	0	0	0	1	1	1	1	0	0
## 2016-09-04	0	1	0	0	0	1	0	1	0	1	1
## 2016-09-05	0	0	1	0	0	1	1	1	1	0	0
## 2016-09-06	0	0	0	1	0	1	0	1	0	0	0
## 2016-09-07	0	1	0	0	0	1	0	1	1	0	0
## 2016-09-08	0	1	0	0	0	1	0	0	1	1	0
## 2016-09-09	1	1	1	0	0	1	0	0	1	0	1
## 2016-09-10	1	0	0	0	0	1	0	0	1	0	1
## 2016-09-11	0	0	0	1	0	1	1	0	1	0	0
## 2016-09-12	0	0	0	0	0	1	0	0	0	1	0
## 2016-09-13	1	1	0	0	0	1	0	0	1	0	1
## 2016-09-14	0	0	1	1	0	1	0	0	0	0	0
## 2016-09-15	0	0	1	0	1	1	0	0	0	1	1
## 2016-09-16	0	0	1	0	1	1	0	1	0	0	0
## 2016-09-17	0	1	1	1	0	0	0	0	0	0	0
## 2016-09-18	1	1	0	1	0	1	0	0	0	0	0
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## 2016-09-20	0	0	0	0	0	0	0	1	0	0	0
## 2016-09-21	0	0	1	1	0	1	1	1	0	0	0
## 2016-09-22	0	1	0	0	1	0	1	0	1	0	0
## 2016-09-23	0	1	0	0	0	1	0	0	0	0	1
## 2016-09-24	0	1	1	0	1	0	0	0	0	0	0

## 2016-09-25	0	0	1	0	0	0	1	0	0	0	0
## 2016-09-26	0	0	1	0	0	0	0	0	0	0	0
## 2016-09-27	0	0	0	0	0	0	0	0	1	0	0
## 2016-09-28	0	1	1	0	0	1	1	1	0	0	0
## 2016-09-29	0	0	1	1	1	1	0	1	0	0	0
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## 2016-10-01	0	0	0	0	0	0	1	1	0	1	1
## 2016-10-02	1	0	1	1	0	0	1	0	0	0	0
## 2016-10-03	0	0	0	0	0	1	1	0	1	0	0
## 2016-10-04	1	0	0	0	0	1	0	1	0	0	1
## 2016-10-05	0	1	0	0	0	0	0	0	0	0	0
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## 2016-10-07	1	0	0	0	1	0	0	0	0	1	0
## 2016-10-08	0	0	0	1	0	1	0	0	1	0	0
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## 2016-10-12	0	1	0	0	1	0	0	0	1	1	0
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## 2016-10-14	0	1	0	0	1	1	0	0	1	0	1
## 2016-10-15	0	0	0	0	0	0	0	0	0	1	0
## 2016-10-16	0	0	1	0	0	0	0	1	1	1	0
## 2016-10-17	0	0	0	0	0	0	0	1	1	0	0
## 2016-10-18	0	0	0	1	1	0	0	0	1	0	0
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## 2016-10-20	0	0	1	1	0	0	0	0	1	0	0
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## 2016-10-23	0	1	0	1	0	0	0	0	0	0	0
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## 2016-10-26	0	0	0	1	0	0	0	1	0	0	0
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## 2016-10-28	0	1	0	1	0	0	0	0	0	0	0
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## 2016-10-30	1	1	1	0	0	0	0	0	0	0	0
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## 2016-11-01	0	1	0	1	0	1	0	1	0	0	0
## 2016-11-02	0	0	1	0	0	1	0	0	1	1	0
## 2016-11-03	1	0	1	0	0	1	1	0	0	0	1
## 2016-11-04	0	0	1	0	0	0	0	1	0	0	0
## 2016-11-05	0	0	0	0	1	0	1	0	0	1	1
## 2016-11-06	0	0	1	1	0	1	0	0	0	0	0
## 2016-11-07	0	1	0	1	0	1	0	0	0	0	0
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## 2016-11-09	0	0	0	0	0	0	0	0	0	0	0
## 2016-11-10	0	0	0	0	1	0	1	0	0	0	1
## 2016-11-11	0	0	1	0	0	1	0	0	0	0	0
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## 2016-11-13	1	0	0	0	1	0	1	0	0	1	1
## 2016-11-14	1	0	0	0	0	0	1	0	1	0	0
##	신사복	카페	식당	운동복	핸드폰	프린터	세탁기	탁자	장롱		
## 2016-01-10	0	0	0	0	0	0	0	0	0	1	
## 2016-01-11	0	0	1	0	0	0	0	0	1	1	
## 2016-01-12	1	0	0	0	0	0	0	0	1	0	
## 2016-01-13	0	0	0	0	0	0	0	0	0	0	
## 2016-01-14	1	0	0	0	0	0	1	0	0	1	
## 2016-01-15	1	1	0	1	0	0	0	0	1	1	
## 2016-01-16	0	1	1	1	0	0	0	1	1	1	
## 2016-01-17	0	0	0	0	1	1	0	0	0	0	
## 2016-01-18	1	0	1	0	1	0	0	1	0	0	
## 2016-01-19	0	0	1	0	0	0	0	1	0	0	
## 2016-01-20	1	1	0	0	1	1	0	0	0	0	
## 2016-01-21	0	0	0	1	1	0	0	0	0	0	
## 2016-01-22	1	0	0	1	0	0	0	1	0	1	
## 2016-01-23	1	1	0	1	0	0	0	0	0	0	
## 2016-01-24	0	0	1	0	1	1	0	0	1	1	
## 2016-01-25	0	0	1	0	0	0	0	0	1	0	
## 2016-01-26	0	0	0	0	1	0	0	1	0	0	
## 2016-01-27	0	1	0	0	0	0	1	0	0	1	
## 2016-01-28	0	0	0	0	0	0	0	1	1	0	
## 2016-01-29	0	1	1	1	0	0	0	0	1	1	
## 2016-01-30	0	0	1	1	0	0	0	1	0	1	
## 2016-01-31	0	0	0	1	0	0	0	0	1	0	
## 2016-02-01	0	0	0	0	1	1	0	0	0	0	
## 2016-02-02	1	0	0	0	0	0	1	0	1	0	
## 2016-02-03	1	0	1	0	1	0	0	0	0	0	
## 2016-02-04	0	0	0	1	0	1	0	0	0	0	
## 2016-02-05	0	0	0	1	0	0	0	0	0	0	
## 2016-02-06	0	0	1	0	0	1	0	0	0	0	
## 2016-02-07	1	1	0	0	0	0	0	1	0	0	
## 2016-02-08	0	0	0	0	0	0	0	1	1	0	
## 2016-02-09	0	0	0	0	0	1	0	0	0	0	
## 2016-02-10	1	0	0	0	0	0	0	1	0	0	
## 2016-02-11	0	0	0	0	1	1	0	0	1	0	
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## 2016-02-13	1	0	0	0	0	0	0	1	0	0	
## 2016-02-14	0	0	1	0	0	1	0	0	1	0	
## 2016-02-15	1	1	1	1	1	0	0	0	0	0	
## 2016-02-16	0	0	0	0	0	0	0	0	0	1	
## 2016-02-17	1	0	0	0	0	0	0	1	1	0	
## 2016-02-18	0	1	0	0	0	0	0	1	1	0	
## 2016-02-19	0	0	0	0	0	0	0	0	1	1	
## 2016-02-20	1	0	0	0	1	1	0	0	0	0	
## 2016-02-21	0	1	0	0	0	1	0	0	0	1	
## 2016-02-22	0	0	1	0	0	0	0	0	1	1	
## 2016-02-23	0	1	1	0	0	0	0	0	0	0	

##	2016-02-24	0	1	0	0	0	0	0	0
##	2016-02-25	0	0	1	0	0	0	0	0
##	2016-02-26	0	0	0	0	0	1	0	0
##	2016-02-27	0	1	0	0	0	0	0	0
##	2016-02-28	1	1	0	0	1	0	1	0
##	2016-02-29	1	1	0	0	0	0	0	0
##	2016-03-01	1	1	0	0	1	0	0	0
##	2016-03-02	0	0	0	0	0	1	1	0
##	2016-03-03	0	0	1	0	0	0	0	0
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##	2016-03-05	0	0	1	0	0	1	0	0
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##	2016-03-07	1	0	0	1	1	0	0	0
##	2016-03-08	0	1	0	0	0	0	0	0
##	2016-03-09	0	0	1	0	0	1	0	0
##	2016-03-10	0	0	0	0	0	1	0	0
##	2016-03-11	0	1	0	0	0	0	0	0
##	2016-03-12	0	0	0	1	0	0	1	0
##	2016-03-13	1	1	1	0	0	0	0	0
##	2016-03-14	0	0	1	0	0	1	0	1
##	2016-03-15	0	0	0	0	1	0	1	1
##	2016-03-16	0	0	0	0	1	0	0	0
##	2016-03-17	0	0	0	0	0	0	0	1
##	2016-03-18	1	0	1	1	0	1	1	0
##	2016-03-19	0	1	0	1	1	1	0	0
##	2016-03-20	0	0	1	1	1	0	1	0
##	2016-03-21	1	0	0	1	0	0	0	1
##	2016-03-22	1	0	0	1	0	1	0	1
##	2016-03-23	0	1	0	1	0	1	0	0
##	2016-03-24	0	0	1	1	0	0	1	0
##	2016-03-25	0	0	0	0	0	0	0	0
##	2016-03-26	0	0	0	0	0	0	0	1
##	2016-03-27	0	0	0	1	0	0	0	0
##	2016-03-28	0	1	0	0	1	1	0	0
##	2016-03-29	0	1	0	0	1	0	0	0
##	2016-03-30	0	1	0	0	0	0	0	1
##	2016-03-31	0	0	1	0	1	1	0	0
##	2016-04-01	1	0	0	1	0	0	0	1
##	2016-04-02	0	0	0	0	1	0	0	0
##	2016-04-03	1	1	0	0	0	1	1	0
##	2016-04-04	0	0	1	0	1	1	0	0
##	2016-04-05	1	0	1	1	0	0	0	0
##	2016-04-06	0	0	0	1	0	0	0	0
##	2016-04-07	0	0	0	0	0	0	0	0
##	2016-04-08	1	1	0	1	1	0	1	0
##	2016-04-09	1	0	0	1	1	0	0	0
##	2016-04-10	0	1	0	1	0	0	0	0
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##	2016-04-12	0	0	0	0	0	0	0	0

## 2016-04-13	1	0	0	0	0	1	0	1	1
## 2016-04-14	0	0	0	0	0	0	1	0	0
## 2016-04-15	0	0	1	1	1	0	1	0	0
## 2016-04-16	0	0	0	0	1	1	1	1	0
## 2016-04-17	0	1	0	0	1	0	0	1	1
## 2016-04-18	0	0	0	0	0	0	1	0	0
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## 2016-04-21	1	0	0	1	1	1	1	0	0
## 2016-04-22	0	0	0	0	1	1	0	1	1
## 2016-04-23	1	1	0	0	1	1	1	0	0
## 2016-04-24	0	0	0	1	1	1	0	0	0
## 2016-04-25	0	1	0	0	1	1	1	0	1
## 2016-04-26	0	1	0	0	1	1	0	0	1
## 2016-04-27	0	0	1	0	1	1	1	0	0
## 2016-04-28	0	0	0	0	1	1	0	1	0
## 2016-04-29	0	1	0	0	1	1	1	1	0
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## 2016-05-01	0	0	1	0	1	1	1	1	0
## 2016-05-02	0	0	1	0	1	1	0	0	0
## 2016-05-03	1	1	0	1	1	1	1	0	0
## 2016-05-04	1	0	1	1	1	1	0	1	0
## 2016-05-05	1	0	0	0	1	1	1	0	0
## 2016-05-06	0	0	0	0	1	1	0	0	1
## 2016-05-07	0	0	1	0	1	1	0	1	0
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## 2016-05-09	0	1	1	0	1	1	0	0	1
## 2016-05-10	1	0	0	1	1	1	0	1	1
## 2016-05-11	1	0	0	0	1	1	0	0	0
## 2016-05-12	0	1	0	0	1	1	0	0	0
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## 2016-05-14	0	0	0	0	1	1	1	1	1
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## 2016-05-22	0	0	0	1	1	1	0	0	1
## 2016-05-23	0	0	0	1	1	1	1	1	0
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## 2016-06-12	1	1	0	0	1	1	0	0	0
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## 2016-10-05	0	0	1	1	0	0	1	1	1
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## 2016-10-22	1	0	0	0	0	0	1	1	1
## 2016-10-23	1	1	0	1	1	0	1	1	1
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## 2016-10-25	0	0	0	1	0	0	1	1	1

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## 2016-10-26      0      0      0      0      0      0      1      1      1
## 2016-10-27      0      1      0      0      0      0      1      1      1
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## 2016-10-29      0      0      0      0      0      0      1      1      1
## 2016-10-30      0      0      0      1      0      0      1      1      1
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## 2016-11-02      0      0      1      0      0      0      1      1      1
## 2016-11-03      0      0      0      0      1      0      1      1      1
## 2016-11-04      0      1      1      0      0      1      1      1      1
## 2016-11-05      0      0      0      0      0      0      1      1      1
## 2016-11-06      1      0      0      0      0      1      1      1      1
## 2016-11-07      0      0      1      1      0      0      1      1      1
## 2016-11-08      0      1      0      0      0      0      1      1      1
## 2016-11-09      0      0      0      1      0      0      1      1      1
## 2016-11-10      0      1      0      0      0      1      1      1      1
## 2016-11-11      0      0      0      1      0      1      1      1      1
## 2016-11-12      0      1      0      0      0      0      1      1      1
## 2016-11-13      0      1      0      0      0      0      1      1      1
## 2016-11-14      0      0      0      0      0      0      1      1      1
```

3-1) 분석 지지도 0.3, 신뢰도 0.7 로 apriori 알고리즘을 적용해보자.

```
library(arules)

## Loading required package: Matrix

##
## Attaching package: 'arules'

## The following object is masked from 'package:tm':
##
##      inspect

## The following objects are masked from 'package:base':
##
##      abbreviate, write

trans <- as.matrix(advice3 , "Transaction")
trans

##           교환 포장 TV 고등어 곰팡이 구두 노트북 라면 초밥 스팸 연어
## 2016-01-10      0      0  0          1          0      0          0      0      1      0      1
## 2016-01-11      1      0  0          1          0      0          0      0      1      0      1
## 2016-01-12      1      0  1          1          1      0          1      1      1      0      1
## 2016-01-13      0      0  0          1          0      0          0      1      1      0      1
## 2016-01-14      0      0  1          1          0      0          0      0      1      0      1
## 2016-01-15      0      0  0          1          0      0          0      0      1      0      1
## 2016-01-16      0      1  1          1          0      0          1      1      1      0      1
## 2016-01-17      0      1  0          1          0      0          1      0      1      0      1
```


## 2016-01-18	0	1	1	1	0	1	0	1	1	0	1
## 2016-01-19	0	0	0	1	0	0	0	1	1	0	1
## 2016-01-20	0	0	1	1	1	0	0	1	1	0	1
## 2016-01-21	0	1	0	1	1	1	0	0	1	0	1
## 2016-01-22	0	0	0	1	1	0	0	0	1	0	1
## 2016-01-23	0	0	1	1	0	1	0	0	1	0	1
## 2016-01-24	1	0	0	1	0	0	1	1	1	0	1
## 2016-01-25	1	0	0	1	0	1	0	0	1	0	1
## 2016-01-26	0	1	0	1	0	0	0	0	1	1	1
## 2016-01-27	0	0	0	1	0	0	0	0	1	1	1
## 2016-01-28	0	0	0	1	1	1	1	0	1	1	1
## 2016-01-29	1	0	1	1	0	0	0	0	1	0	1
## 2016-01-30	0	1	0	1	0	0	0	0	1	0	1
## 2016-01-31	1	0	0	1	0	0	1	0	1	0	1
## 2016-02-01	1	0	0	1	0	0	1	0	1	0	1
## 2016-02-02	0	0	0	1	0	0	1	0	1	0	1
## 2016-02-03	1	1	0	1	0	0	0	0	1	1	1
## 2016-02-04	0	1	1	1	0	0	0	1	1	0	1
## 2016-02-05	0	0	0	1	0	1	0	1	1	1	1
## 2016-02-06	0	1	0	1	0	1	0	0	1	0	1
## 2016-02-07	0	0	0	1	1	0	0	1	1	1	1
## 2016-02-08	0	1	1	1	0	0	0	0	1	0	1
## 2016-02-09	0	0	0	1	0	1	0	0	1	0	1
## 2016-02-10	0	0	0	1	1	0	0	0	1	1	1
## 2016-02-11	1	0	1	1	1	0	1	0	1	0	1
## 2016-02-12	0	0	0	1	0	0	0	1	1	0	1
## 2016-02-13	0	0	0	1	0	0	0	0	1	0	1
## 2016-02-14	0	0	0	1	0	1	1	0	1	0	1
## 2016-02-15	1	0	0	1	0	0	1	0	1	1	1
## 2016-02-16	0	1	0	1	0	1	1	1	1	1	1
## 2016-02-17	0	1	0	1	0	0	1	0	1	0	1
## 2016-02-18	0	1	1	1	0	0	0	1	1	0	1
## 2016-02-19	0	1	0	1	1	0	1	1	1	0	1
## 2016-02-20	1	0	0	1	0	1	1	0	1	0	1
## 2016-02-21	1	0	1	1	1	0	0	0	1	1	1
## 2016-02-22	1	0	0	1	1	0	0	0	1	1	1
## 2016-02-23	1	0	0	1	1	0	0	0	1	0	1
## 2016-02-24	0	1	0	1	0	0	1	1	1	0	1
## 2016-02-25	1	0	0	1	1	0	0	0	1	1	1
## 2016-02-26	0	0	0	1	0	0	0	0	1	1	1
## 2016-02-27	0	0	0	1	0	0	0	0	1	1	1
## 2016-02-28	0	1	0	1	0	1	0	0	1	0	1
## 2016-02-29	0	0	0	1	0	0	1	0	1	0	1
## 2016-03-01	1	0	0	1	0	0	0	0	1	1	1
## 2016-03-02	0	0	1	1	1	0	1	1	1	0	1
## 2016-03-03	0	1	0	1	1	0	0	1	1	0	1
## 2016-03-04	1	0	0	1	0	0	0	0	1	1	1
## 2016-03-05	0	0	0	1	1	1	0	1	1	0	1
## 2016-03-06	1	0	0	1	0	0	1	0	1	0	1

## 2016-03-07	0	0	0	1	0	0	0	1	1	0	1
## 2016-03-08	0	1	1	1	0	0	0	0	1	0	1
## 2016-03-09	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-10	1	1	1	1	0	0	0	0	1	0	1
## 2016-03-11	0	0	0	1	1	0	0	1	1	0	1
## 2016-03-12	0	0	0	1	1	1	0	0	1	0	1
## 2016-03-13	1	0	0	1	0	0	0	1	1	1	1
## 2016-03-14	0	0	1	1	0	1	0	1	1	1	1
## 2016-03-15	0	1	0	1	0	0	1	0	1	0	1
## 2016-03-16	0	1	0	1	1	0	1	0	1	1	1
## 2016-03-17	0	0	0	1	0	0	0	0	1	0	1
## 2016-03-18	1	0	0	1	0	0	0	0	1	0	1
## 2016-03-19	0	0	0	1	0	1	0	0	1	1	1
## 2016-03-20	1	0	0	1	0	0	1	0	1	0	1
## 2016-03-21	0	1	0	1	0	0	0	0	1	0	1
## 2016-03-22	0	1	0	1	0	0	0	1	1	0	1
## 2016-03-23	0	1	0	1	1	1	0	0	1	0	1
## 2016-03-24	0	0	0	1	0	0	0	1	1	0	1
## 2016-03-25	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-26	0	0	0	1	0	1	0	0	1	1	1
## 2016-03-27	1	0	0	1	0	0	0	1	1	0	1
## 2016-03-28	0	1	0	1	1	0	0	0	1	1	1
## 2016-03-29	1	0	0	1	0	1	0	1	1	1	1
## 2016-03-30	0	0	1	1	0	0	0	0	1	0	1
## 2016-03-31	1	0	0	1	1	0	0	0	1	0	1
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## 2016-04-02	1	1	0	1	0	1	0	1	1	0	1
## 2016-04-03	0	0	0	1	0	0	0	0	1	0	1
## 2016-04-04	0	1	1	1	0	1	1	0	1	0	1
## 2016-04-05	1	0	1	1	0	0	0	0	1	0	1
## 2016-04-06	1	0	1	1	0	0	1	0	1	1	1
## 2016-04-07	1	0	1	1	1	0	0	1	1	0	1
## 2016-04-08	1	0	0	1	1	1	0	0	1	0	1
## 2016-04-09	0	1	0	1	1	1	0	0	1	0	1
## 2016-04-10	1	0	0	1	1	0	0	0	1	0	1
## 2016-04-11	0	1	1	1	0	1	0	0	1	1	1
## 2016-04-12	0	0	0	1	0	0	1	1	1	0	1
## 2016-04-13	1	1	0	1	0	0	0	0	1	0	1
## 2016-04-14	1	1	0	1	0	0	0	0	1	1	1
## 2016-04-15	0	0	1	1	0	0	0	0	1	0	1
## 2016-04-16	1	1	0	1	0	0	0	1	1	0	1
## 2016-04-17	0	0	1	1	0	0	0	0	1	0	1
## 2016-04-18	0	0	0	1	0	0	0	0	1	1	1
## 2016-04-19	0	0	1	0	0	0	1	0	1	0	0
## 2016-04-20	0	0	1	0	1	0	1	0	0	0	0
## 2016-04-21	0	0	1	0	1	0	1	0	0	0	1
## 2016-04-22	1	0	1	0	1	0	1	0	1	1	1
## 2016-04-23	0	0	1	0	0	1	1	1	0	0	0
## 2016-04-24	1	0	1	0	0	0	1	0	0	0	1

## 2016-04-25	0	0	1	0	0	1	1	0	1	0	0
## 2016-04-26	0	0	1	1	0	1	1	0	1	0	0
## 2016-04-27	0	0	1	0	0	0	1	0	0	0	1
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## 2016-04-29	0	0	1	0	0	1	1	0	1	0	0
## 2016-04-30	1	0	1	1	0	0	1	0	0	0	0
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## 2016-05-03	0	0	1	0	0	0	1	1	0	1	0
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## 2016-05-05	0	1	1	0	1	0	1	0	0	0	0
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## 2016-05-07	1	0	1	0	0	0	1	0	1	0	0
## 2016-05-08	1	1	1	1	1	0	1	0	0	0	0
## 2016-05-09	0	0	1	1	0	0	1	0	0	0	0
## 2016-05-10	0	0	1	0	0	0	1	0	0	1	0
## 2016-05-11	0	0	1	1	0	0	1	0	0	1	1
## 2016-05-12	0	0	1	1	1	1	1	0	0	0	0
## 2016-05-13	1	0	1	0	0	0	1	0	0	1	0
## 2016-05-14	1	0	1	0	0	0	1	1	0	0	0
## 2016-05-15	0	0	1	0	0	1	1	1	0	0	0
## 2016-05-16	0	0	1	0	0	0	1	0	1	1	0
## 2016-05-17	0	0	1	1	0	0	1	1	0	0	0
## 2016-05-18	0	0	1	1	0	0	1	1	0	0	1
## 2016-05-19	1	0	1	1	0	0	1	0	0	0	1
## 2016-05-20	0	1	1	1	0	1	1	0	0	0	0
## 2016-05-21	0	1	1	0	1	1	1	0	1	1	0
## 2016-05-22	0	0	1	0	0	0	1	0	0	0	0
## 2016-05-23	0	0	1	0	0	0	1	1	1	1	0
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## 2016-05-25	1	0	1	0	1	0	1	0	0	1	0
## 2016-05-26	0	1	1	1	1	0	1	1	0	1	0
## 2016-05-27	1	0	1	0	0	0	1	0	1	1	1
## 2016-05-28	1	0	1	0	0	1	1	1	0	0	1
## 2016-05-29	1	1	1	1	0	0	1	0	0	0	0
## 2016-05-30	0	1	1	0	0	0	1	0	0	1	0
## 2016-05-31	1	0	1	0	0	1	1	1	0	0	1
## 2016-06-01	0	0	1	1	1	0	1	0	0	1	0
## 2016-06-02	0	0	1	0	0	0	1	0	1	0	0
## 2016-06-03	0	0	1	0	1	0	1	1	0	0	0
## 2016-06-04	1	0	1	1	0	0	1	1	0	0	1
## 2016-06-05	0	0	1	1	0	1	1	0	1	0	0
## 2016-06-06	1	0	1	1	1	0	1	0	0	0	0
## 2016-06-07	1	1	1	0	0	1	1	1	0	1	1
## 2016-06-08	0	0	1	1	0	1	1	0	1	1	1
## 2016-06-09	0	0	1	0	1	1	1	0	0	1	0
## 2016-06-10	0	0	1	0	0	0	1	0	1	1	0
## 2016-06-11	0	0	1	0	0	0	1	1	1	1	0
## 2016-06-12	1	1	1	0	1	0	1	0	0	1	0

## 2016-06-13	0	0	1	1	0	1	1	0	1	0	0
## 2016-06-14	0	1	1	0	0	0	1	0	0	1	0
## 2016-06-15	0	1	1	1	1	1	1	1	1	1	0
## 2016-06-16	0	0	1	0	0	0	1	0	0	0	1
## 2016-06-17	0	1	1	0	0	0	1	1	0	0	0
## 2016-06-18	0	0	1	0	0	0	1	0	0	0	0
## 2016-06-19	0	0	1	0	0	0	1	0	0	0	1
## 2016-06-20	0	0	1	0	0	1	1	0	0	0	0
## 2016-06-21	0	1	1	0	0	0	1	0	0	0	1
## 2016-06-22	0	0	1	0	1	0	1	0	0	1	0
## 2016-06-23	0	0	1	0	0	0	1	0	1	0	0
## 2016-06-24	1	0	1	1	0	0	1	0	0	1	0
## 2016-06-25	1	0	1	0	1	0	1	1	0	0	0
## 2016-06-26	0	0	1	0	1	0	1	0	0	1	1
## 2016-06-27	1	0	1	0	0	0	1	0	1	0	0
## 2016-06-28	0	1	1	0	0	0	1	0	0	0	1
## 2016-06-29	0	1	1	0	0	0	1	1	1	1	0
## 2016-06-30	0	0	1	0	1	0	1	0	1	0	1
## 2016-07-01	0	0	1	0	1	1	1	0	0	0	0
## 2016-07-02	0	0	1	0	0	0	1	1	0	1	0
## 2016-07-03	0	1	1	0	1	1	1	0	1	0	1
## 2016-07-04	0	0	1	0	0	0	1	1	0	0	1
## 2016-07-05	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-06	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-07	0	0	1	1	0	0	1	0	0	0	0
## 2016-07-08	1	0	1	0	0	1	1	0	0	0	1
## 2016-07-09	0	0	1	1	1	0	1	1	0	0	1
## 2016-07-10	0	1	1	0	0	0	1	0	1	0	0
## 2016-07-11	0	0	1	1	0	0	1	1	0	0	0
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## 2016-07-13	0	0	1	0	1	0	1	0	0	1	1
## 2016-07-14	0	0	1	0	0	0	1	0	0	0	0
## 2016-07-15	1	0	1	0	1	0	1	0	0	0	0
## 2016-07-16	1	0	1	0	0	1	1	1	0	0	1
## 2016-07-17	0	0	1	1	0	0	1	1	0	0	0
## 2016-07-18	0	0	1	1	1	0	1	1	0	0	0
## 2016-07-19	1	0	1	0	0	0	1	0	0	0	0
## 2016-07-20	1	1	1	1	1	0	1	0	1	1	0
## 2016-07-21	0	0	1	0	1	0	1	0	0	1	0
## 2016-07-22	0	0	1	0	1	0	1	1	0	0	0
## 2016-07-23	0	0	1	1	1	0	1	0	0	0	0
## 2016-07-24	0	0	1	0	0	1	1	0	1	0	1
## 2016-07-25	0	0	1	0	0	0	1	0	0	0	0
## 2016-07-26	1	1	1	0	1	0	1	0	0	0	0
## 2016-07-27	0	0	1	0	0	1	1	0	0	0	0
## 2016-07-28	0	0	1	0	0	1	1	1	1	0	0
## 2016-07-29	1	0	0	0	0	1	1	0	1	0	0
## 2016-07-30	0	0	0	1	0	1	0	1	0	0	0
## 2016-07-31	1	0	0	0	0	1	0	1	0	0	1

## 2016-08-01	0	1	1	0	0	1	1	1	1	1	0
## 2016-08-02	0	1	0	0	1	1	0	1	1	0	1
## 2016-08-03	0	1	1	0	0	1	1	0	1	0	0
## 2016-08-04	0	1	0	0	1	1	0	0	0	1	0
## 2016-08-05	1	0	0	0	0	1	0	0	0	0	0
## 2016-08-06	0	1	0	1	0	1	0	0	0	0	0
## 2016-08-07	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-08	0	0	1	1	1	1	0	0	0	1	0
## 2016-08-09	1	0	0	0	0	1	1	1	0	0	0
## 2016-08-10	0	0	0	0	0	1	0	0	0	0	1
## 2016-08-11	0	0	0	1	1	1	1	0	0	0	1
## 2016-08-12	1	0	0	0	0	1	0	0	0	0	1
## 2016-08-13	0	1	0	0	0	1	0	1	1	0	1
## 2016-08-14	0	0	0	0	0	1	0	0	0	1	1
## 2016-08-15	1	1	0	0	0	1	0	0	0	0	1
## 2016-08-16	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-17	0	0	0	0	0	1	0	0	0	1	1
## 2016-08-18	0	0	0	1	1	1	1	0	0	0	1
## 2016-08-19	0	0	0	0	1	1	0	0	0	0	0
## 2016-08-20	1	0	0	0	0	1	1	1	0	0	0
## 2016-08-21	0	0	0	0	0	1	0	0	0	0	0
## 2016-08-22	1	0	0	0	1	1	1	0	0	0	0
## 2016-08-23	0	0	1	0	0	1	1	0	0	0	1
## 2016-08-24	1	0	0	0	1	1	0	0	0	0	1
## 2016-08-25	1	0	0	0	0	1	0	0	0	1	1
## 2016-08-26	0	1	0	0	0	1	1	0	0	0	0
## 2016-08-27	0	1	0	1	0	1	1	0	0	0	0
## 2016-08-28	0	1	1	1	0	1	1	0	0	0	0
## 2016-08-29	0	0	0	0	0	1	1	0	0	0	0
## 2016-08-30	0	0	0	1	0	1	0	1	1	0	0
## 2016-08-31	1	0	0	0	1	1	0	1	0	0	0
## 2016-09-01	0	0	0	1	1	1	0	0	1	1	0
## 2016-09-02	0	0	0	1	0	1	0	1	0	1	0
## 2016-09-03	0	0	0	0	0	1	1	1	1	0	0
## 2016-09-04	0	1	0	0	0	1	0	1	0	1	1
## 2016-09-05	0	0	1	0	0	1	1	1	1	0	0
## 2016-09-06	0	0	0	1	0	1	0	1	0	0	0
## 2016-09-07	0	1	0	0	0	1	0	1	1	0	0
## 2016-09-08	0	1	0	0	0	1	0	0	1	1	0
## 2016-09-09	1	1	1	0	0	1	0	0	1	0	1
## 2016-09-10	1	0	0	0	0	1	0	0	1	0	1
## 2016-09-11	0	0	0	1	0	1	1	0	1	0	0
## 2016-09-12	0	0	0	0	0	1	0	0	0	1	0
## 2016-09-13	1	1	0	0	0	1	0	0	1	0	1
## 2016-09-14	0	0	1	1	0	1	0	0	0	0	0
## 2016-09-15	0	0	1	0	1	1	0	0	0	1	1
## 2016-09-16	0	0	1	0	1	1	0	1	0	0	0
## 2016-09-17	0	1	1	1	0	0	0	0	0	0	0
## 2016-09-18	1	1	0	1	0	1	0	0	0	0	0

## 2016-09-19	0	0	0	0	0	0	0	1	0	1	0
## 2016-09-20	0	0	0	0	0	0	0	1	0	0	0
## 2016-09-21	0	0	1	1	0	1	1	1	0	0	0
## 2016-09-22	0	1	0	0	1	0	1	0	1	0	0
## 2016-09-23	0	1	0	0	0	1	0	0	0	0	1
## 2016-09-24	0	1	1	0	1	0	0	0	0	0	0
## 2016-09-25	0	0	1	0	0	0	1	0	0	0	0
## 2016-09-26	0	0	1	0	0	0	0	0	0	0	0
## 2016-09-27	0	0	0	0	0	0	0	0	1	0	0
## 2016-09-28	0	1	1	0	0	1	1	1	0	0	0
## 2016-09-29	0	0	1	1	1	1	0	1	0	0	0
## 2016-09-30	0	0	0	0	0	0	0	0	0	0	1
## 2016-10-01	0	0	0	0	0	0	1	1	0	1	1
## 2016-10-02	1	0	1	1	0	0	1	0	0	0	0
## 2016-10-03	0	0	0	0	0	1	1	0	1	0	0
## 2016-10-04	1	0	0	0	0	1	0	1	0	0	1
## 2016-10-05	0	1	0	0	0	0	0	0	0	0	0
## 2016-10-06	1	0	0	1	0	1	0	0	1	0	0
## 2016-10-07	1	0	0	0	1	0	0	0	0	1	0
## 2016-10-08	0	0	0	1	0	1	0	0	1	0	0
## 2016-10-09	1	0	1	0	0	1	0	0	0	0	0
## 2016-10-10	0	0	0	0	0	0	1	0	0	0	0
## 2016-10-11	0	0	1	0	0	0	0	0	1	1	1
## 2016-10-12	0	1	0	0	1	0	0	0	1	1	0
## 2016-10-13	0	0	0	0	1	1	0	0	0	1	0
## 2016-10-14	0	1	0	0	1	1	0	0	1	0	1
## 2016-10-15	0	0	0	0	0	0	0	0	0	1	0
## 2016-10-16	0	0	1	0	0	0	0	1	1	1	0
## 2016-10-17	0	0	0	0	0	0	0	1	1	0	0
## 2016-10-18	0	0	0	1	1	0	0	0	1	0	0
## 2016-10-19	0	0	0	0	0	0	0	0	0	1	0
## 2016-10-20	0	0	1	1	0	0	0	0	1	0	0
## 2016-10-21	0	0	1	0	1	0	0	0	0	0	0
## 2016-10-22	1	1	0	0	0	1	0	0	0	0	0
## 2016-10-23	0	1	0	1	0	0	0	0	0	0	0
## 2016-10-24	0	0	1	0	0	1	0	0	1	0	0
## 2016-10-25	0	0	0	0	1	0	1	1	0	0	1
## 2016-10-26	0	0	0	1	0	0	0	1	0	0	0
## 2016-10-27	0	0	0	0	0	1	0	0	0	0	0
## 2016-10-28	0	1	0	1	0	0	0	0	0	0	0
## 2016-10-29	1	0	1	0	1	0	0	0	1	1	1
## 2016-10-30	1	1	1	0	0	0	0	0	0	0	0
## 2016-10-31	0	0	1	0	1	0	1	0	1	0	0
## 2016-11-01	0	1	0	1	0	1	0	1	0	0	0
## 2016-11-02	0	0	1	0	0	1	0	0	1	1	0
## 2016-11-03	1	0	1	0	0	1	1	0	0	0	1
## 2016-11-04	0	0	1	0	0	0	0	1	0	0	0
## 2016-11-05	0	0	0	0	1	0	1	0	0	1	1
## 2016-11-06	0	0	1	1	0	1	0	0	0	0	0

## 2016-11-07	0	1	0	1	0	1	0	0	0	0	0
## 2016-11-08	0	0	0	1	1	1	0	0	0	0	0
## 2016-11-09	0	0	0	0	0	0	0	0	0	0	0
## 2016-11-10	0	0	0	0	1	0	1	0	0	0	1
## 2016-11-11	0	0	1	0	0	1	0	0	0	0	0
## 2016-11-12	0	0	0	1	0	0	0	0	0	0	1
## 2016-11-13	1	0	0	0	1	0	1	0	0	1	1
## 2016-11-14	1	0	0	0	0	0	1	0	1	0	0

신사복 카페 식당 운동복 핸드폰 프린터 세탁기 탁자 장롱

## 2016-01-10	0	0	0	0	0	0	0	0	1
## 2016-01-11	0	0	1	0	0	0	0	1	1
## 2016-01-12	1	0	0	0	0	0	0	1	0
## 2016-01-13	0	0	0	0	0	0	0	0	0
## 2016-01-14	1	0	0	0	0	1	0	0	1
## 2016-01-15	1	1	0	1	0	0	0	1	1
## 2016-01-16	0	1	1	1	0	0	1	1	1
## 2016-01-17	0	0	0	0	1	1	0	0	0
## 2016-01-18	1	0	1	0	1	0	1	0	0
## 2016-01-19	0	0	1	0	0	0	1	0	0
## 2016-01-20	1	1	0	0	1	1	0	0	0
## 2016-01-21	0	0	0	1	1	0	0	0	0
## 2016-01-22	1	0	0	1	0	0	1	0	1
## 2016-01-23	1	1	0	1	0	0	0	0	0
## 2016-01-24	0	0	1	0	1	1	0	1	1
## 2016-01-25	0	0	1	0	0	0	0	1	0
## 2016-01-26	0	0	0	0	1	0	1	0	0
## 2016-01-27	0	1	0	0	0	1	0	0	1
## 2016-01-28	0	0	0	0	0	0	1	1	0
## 2016-01-29	0	1	1	1	0	0	0	1	1
## 2016-01-30	0	0	1	1	0	0	1	0	1
## 2016-01-31	0	0	0	1	0	0	0	1	0
## 2016-02-01	0	0	0	0	1	1	0	0	0
## 2016-02-02	1	0	0	0	0	1	0	1	0
## 2016-02-03	1	0	1	0	1	0	0	0	0
## 2016-02-04	0	0	0	1	0	1	0	0	0
## 2016-02-05	0	0	0	1	0	0	0	0	0
## 2016-02-06	0	0	1	0	0	1	0	0	0
## 2016-02-07	1	1	0	0	0	0	1	0	0
## 2016-02-08	0	0	0	0	0	0	1	1	0
## 2016-02-09	0	0	0	0	0	1	0	0	0
## 2016-02-10	1	0	0	0	0	0	1	0	0
## 2016-02-11	0	0	0	0	1	1	0	1	0
## 2016-02-12	0	0	0	0	1	0	0	0	0
## 2016-02-13	1	0	0	0	0	0	1	0	0
## 2016-02-14	0	0	1	0	0	1	0	1	0
## 2016-02-15	1	1	1	1	1	0	0	0	0
## 2016-02-16	0	0	0	0	0	0	0	0	1
## 2016-02-17	1	0	0	0	0	0	1	1	0

## 2016-02-18	0	1	0	0	0	0	1	1	0
## 2016-02-19	0	0	0	0	0	0	0	1	1
## 2016-02-20	1	0	0	0	1	1	0	0	0
## 2016-02-21	0	1	0	0	0	1	0	0	1
## 2016-02-22	0	0	1	0	0	0	0	1	1
## 2016-02-23	0	1	1	0	0	0	0	0	0
## 2016-02-24	0	1	0	0	0	0	0	0	0
## 2016-02-25	0	0	1	0	0	0	0	0	0
## 2016-02-26	0	0	0	0	0	1	0	0	0
## 2016-02-27	0	1	0	0	0	0	0	0	0
## 2016-02-28	1	1	0	0	1	0	1	0	1
## 2016-02-29	1	1	0	0	0	0	0	0	0
## 2016-03-01	1	1	0	0	1	0	0	0	0
## 2016-03-02	0	0	0	0	0	1	1	0	1
## 2016-03-03	0	0	1	0	0	0	0	0	0
## 2016-03-04	1	1	0	0	0	0	1	1	1
## 2016-03-05	0	0	1	0	0	1	0	0	1
## 2016-03-06	0	0	1	0	1	0	0	1	0
## 2016-03-07	1	0	0	1	1	0	0	0	1
## 2016-03-08	0	1	0	0	0	0	0	0	0
## 2016-03-09	0	0	1	0	0	1	0	0	1
## 2016-03-10	0	0	0	0	0	1	0	0	0
## 2016-03-11	0	1	0	0	0	0	0	0	0
## 2016-03-12	0	0	0	1	0	0	1	0	0
## 2016-03-13	1	1	1	0	0	0	0	0	0
## 2016-03-14	0	0	1	0	0	1	0	1	0
## 2016-03-15	0	0	0	0	1	0	1	1	0
## 2016-03-16	0	0	0	0	1	0	0	0	0
## 2016-03-17	0	0	0	0	0	0	0	0	1
## 2016-03-18	1	0	1	1	0	1	1	0	0
## 2016-03-19	0	1	0	1	1	1	0	0	0
## 2016-03-20	0	0	1	1	1	0	1	0	0
## 2016-03-21	1	0	0	1	0	0	0	1	1
## 2016-03-22	1	0	0	1	0	1	0	1	0
## 2016-03-23	0	1	0	1	0	1	0	0	0
## 2016-03-24	0	0	1	1	0	0	1	0	0
## 2016-03-25	0	0	0	0	0	0	0	0	0
## 2016-03-26	0	0	0	0	0	0	0	1	0
## 2016-03-27	0	0	0	1	0	0	0	0	0
## 2016-03-28	0	1	0	0	1	1	0	0	0
## 2016-03-29	0	1	0	0	1	0	0	0	0
## 2016-03-30	0	1	0	0	0	0	0	1	1
## 2016-03-31	0	0	1	0	1	1	0	0	0
## 2016-04-01	1	0	0	1	0	0	0	1	1
## 2016-04-02	0	0	0	0	1	0	0	0	1
## 2016-04-03	1	1	0	0	0	1	1	0	0
## 2016-04-04	0	0	1	0	1	1	0	0	1
## 2016-04-05	1	0	1	1	0	0	0	0	1
## 2016-04-06	0	0	0	1	0	0	0	0	0

## 2016-04-07	0	0	0	0	0	0	0	0	0
## 2016-04-08	1	1	0	1	1	0	1	0	0
## 2016-04-09	1	0	0	1	1	0	0	0	1
## 2016-04-10	0	1	0	1	0	0	0	0	0
## 2016-04-11	0	0	0	0	1	0	1	1	0
## 2016-04-12	0	0	0	0	0	0	0	0	1
## 2016-04-13	1	0	0	0	0	1	0	1	1
## 2016-04-14	0	0	0	0	0	0	1	0	0
## 2016-04-15	0	0	1	1	1	0	1	0	0
## 2016-04-16	0	0	0	0	1	1	1	1	0
## 2016-04-17	0	1	0	0	1	0	0	1	1
## 2016-04-18	0	0	0	0	0	0	1	0	0
## 2016-04-19	0	0	1	0	1	1	0	0	0
## 2016-04-20	1	1	0	0	1	1	1	0	0
## 2016-04-21	1	0	0	1	1	1	1	0	0
## 2016-04-22	0	0	0	0	1	1	0	1	1
## 2016-04-23	1	1	0	0	1	1	1	0	0
## 2016-04-24	0	0	0	1	1	1	0	0	0
## 2016-04-25	0	1	0	0	1	1	1	0	1
## 2016-04-26	0	1	0	0	1	1	0	0	1
## 2016-04-27	0	0	1	0	1	1	1	0	0
## 2016-04-28	0	0	0	0	1	1	0	1	0
## 2016-04-29	0	1	0	0	1	1	1	1	0
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## 2016-05-01	0	0	1	0	1	1	1	1	0
## 2016-05-02	0	0	1	0	1	1	0	0	0
## 2016-05-03	1	1	0	1	1	1	1	0	0
## 2016-05-04	1	0	1	1	1	1	0	1	0
## 2016-05-05	1	0	0	0	1	1	1	0	0
## 2016-05-06	0	0	0	0	1	1	0	0	1
## 2016-05-07	0	0	1	0	1	1	0	1	0
## 2016-05-08	0	0	0	0	1	1	0	1	0
## 2016-05-09	0	1	1	0	1	1	0	0	1
## 2016-05-10	1	0	0	1	1	1	0	1	1
## 2016-05-11	1	0	0	0	1	1	0	0	0
## 2016-05-12	0	1	0	0	1	1	0	0	0
## 2016-05-13	0	0	1	0	1	1	0	0	0
## 2016-05-14	0	0	0	0	1	1	1	1	1
## 2016-05-15	0	0	0	0	1	1	0	0	0
## 2016-05-16	0	0	0	0	1	1	1	1	0
## 2016-05-17	0	0	1	1	1	1	1	1	0
## 2016-05-18	0	0	1	0	1	1	0	0	0
## 2016-05-19	0	0	0	1	1	1	0	0	0
## 2016-05-20	1	1	1	1	1	1	0	0	0
## 2016-05-21	1	0	1	0	1	1	0	0	1
## 2016-05-22	0	0	0	1	1	1	0	0	1
## 2016-05-23	0	0	0	1	1	1	1	1	0
## 2016-05-24	0	0	0	0	1	1	0	0	0
## 2016-05-25	1	0	0	0	1	1	0	0	0

## 2016-05-26	0	0	0	0	1	1	1	1	0
## 2016-05-27	0	0	0	0	1	1	1	0	1
## 2016-05-28	1	1	0	0	1	1	0	1	0
## 2016-05-29	1	0	0	0	1	1	1	0	0
## 2016-05-30	0	1	1	1	1	1	0	0	0
## 2016-05-31	0	0	1	0	1	1	0	0	1
## 2016-06-01	0	1	0	1	1	1	0	0	1
## 2016-06-02	0	1	1	0	1	1	1	0	0
## 2016-06-03	0	0	0	1	1	1	0	0	0
## 2016-06-04	1	0	0	0	1	1	0	1	1
## 2016-06-05	0	0	0	0	1	1	0	0	0
## 2016-06-06	0	0	1	0	1	1	0	0	0
## 2016-06-07	1	0	0	0	1	1	0	1	1
## 2016-06-08	0	0	0	0	1	1	0	0	0
## 2016-06-09	0	0	1	0	1	1	0	0	1
## 2016-06-10	0	0	1	1	1	1	0	0	1
## 2016-06-11	1	0	0	0	1	1	0	0	1
## 2016-06-12	1	1	0	0	1	1	0	0	0
## 2016-06-13	1	0	1	0	1	1	0	0	1
## 2016-06-14	0	0	0	1	1	1	0	0	1
## 2016-06-15	0	1	0	0	1	1	1	0	0
## 2016-06-16	0	1	0	0	1	1	0	0	1
## 2016-06-17	0	0	0	0	1	1	1	0	0
## 2016-06-18	0	0	0	0	1	1	0	0	0
## 2016-06-19	0	1	0	0	1	1	0	0	0
## 2016-06-20	0	0	0	0	1	1	1	1	0
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## 2016-06-22	1	0	1	0	1	1	0	0	0
## 2016-06-23	0	0	0	0	1	1	0	0	0
## 2016-06-24	1	0	0	0	1	1	0	0	1
## 2016-06-25	0	0	0	0	1	1	0	1	0
## 2016-06-26	0	1	0	0	1	1	0	0	0
## 2016-06-27	0	0	0	1	1	1	1	0	0
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## 2016-07-01	1	1	0	1	1	1	0	1	1
## 2016-07-02	1	0	0	0	1	1	0	0	0
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## 2016-07-05	1	0	0	0	1	1	0	0	0
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## 2016-07-08	0	0	1	0	1	1	0	0	0
## 2016-07-09	0	0	0	1	1	1	0	0	0
## 2016-07-10	1	0	1	0	1	1	0	0	0
## 2016-07-11	0	1	0	1	1	1	1	1	0
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## 2016-07-14	0	1	0	0	1	1	0	1	0
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## 2016-07-16	1	0	0	1	1	1	0	1	1
## 2016-07-17	0	1	0	1	1	1	0	0	0
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## 2016-07-19	0	0	0	0	1	1	0	0	0
## 2016-07-20	1	0	0	0	1	1	0	0	1
## 2016-07-21	0	1	0	0	1	1	0	0	0
## 2016-07-22	1	1	1	0	1	1	0	0	0
## 2016-07-23	0	0	0	1	1	1	0	1	0
## 2016-07-24	0	0	0	1	1	1	0	0	0
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## 2016-07-27	0	0	1	1	1	1	0	0	0
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## 2016-07-30	1	0	1	1	1	0	0	0	0
## 2016-07-31	1	0	0	1	0	0	0	0	1
## 2016-08-01	1	0	0	1	0	0	0	0	0
## 2016-08-02	1	0	0	1	1	1	0	0	0
## 2016-08-03	1	0	0	1	1	0	1	0	0
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## 2016-08-06	1	0	0	1	0	0	0	0	0
## 2016-08-07	1	1	1	1	0	1	1	0	0
## 2016-08-08	1	0	1	1	1	0	0	1	0
## 2016-08-09	1	0	0	1	1	0	0	0	1
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## 2016-08-11	1	0	0	1	0	0	1	0	0
## 2016-08-12	1	0	0	1	0	0	0	1	1
## 2016-08-13	1	1	0	1	0	0	0	1	0
## 2016-08-14	1	0	0	1	0	0	0	0	0
## 2016-08-15	1	0	0	1	0	0	0	1	1
## 2016-08-16	1	0	0	1	0	0	0	0	0
## 2016-08-17	1	0	0	1	1	0	0	1	0
## 2016-08-18	1	0	1	1	1	0	1	0	0
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## 2016-08-20	1	0	0	1	0	0	0	0	1
## 2016-08-21	1	0	0	1	0	1	1	0	0
## 2016-08-22	1	0	0	1	0	0	0	0	1
## 2016-08-23	1	0	0	1	0	1	1	0	0
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## 2016-08-26	1	1	0	1	0	0	0	0	0
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## 2016-08-28	1	1	0	1	0	1	0	0	0
## 2016-08-29	1	0	0	1	0	0	1	0	0
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## 2016-08-31	1	0	1	1	0	1	0	0	1

## 2016-09-01	1	0	0	1	0	0	0	1	0
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## 2016-09-04	1	0	0	1	1	0	0	0	0
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## 2016-09-08	1	0	0	1	0	0	1	0	0
## 2016-09-09	1	0	0	1	0	0	0	0	1
## 2016-09-10	1	0	0	1	0	0	1	0	1
## 2016-09-11	1	1	0	1	0	0	0	0	0
## 2016-09-12	1	0	0	1	0	0	1	1	0
## 2016-09-13	1	0	0	1	0	0	1	0	1
## 2016-09-14	1	0	0	1	0	0	0	0	0
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## 2016-09-17	1	1	0	0	0	0	1	1	1
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## 2016-09-19	0	0	1	0	0	0	1	1	1
## 2016-09-20	0	0	0	1	0	0	1	1	1
## 2016-09-21	0	1	0	0	0	0	1	1	1
## 2016-09-22	0	1	0	0	0	0	1	1	1
## 2016-09-23	1	0	0	0	0	0	1	1	1
## 2016-09-24	0	1	0	1	0	0	1	1	1
## 2016-09-25	1	1	0	0	1	0	1	1	1
## 2016-09-26	0	1	1	0	0	1	1	1	1
## 2016-09-27	1	0	0	0	1	1	1	1	1
## 2016-09-28	1	0	0	1	0	0	1	1	1
## 2016-09-29	0	0	0	0	0	0	1	1	1
## 2016-09-30	1	0	0	0	1	0	1	1	1
## 2016-10-01	0	0	0	1	0	0	1	1	1
## 2016-10-02	1	0	0	0	0	1	1	1	1
## 2016-10-03	0	0	0	1	1	0	1	1	1
## 2016-10-04	1	0	0	0	0	0	1	1	1
## 2016-10-05	0	0	1	1	0	0	1	1	1
## 2016-10-06	1	1	0	0	1	1	1	1	1
## 2016-10-07	0	0	0	0	0	0	1	1	1
## 2016-10-08	0	0	0	0	0	0	1	1	1
## 2016-10-09	0	0	0	1	0	0	1	1	1
## 2016-10-10	0	0	0	1	0	0	1	1	1
## 2016-10-11	0	0	0	1	1	0	1	1	1
## 2016-10-12	0	1	0	0	0	0	1	1	1
## 2016-10-13	0	0	1	0	1	1	1	1	1
## 2016-10-14	0	0	0	0	0	0	1	1	1
## 2016-10-15	1	0	1	0	0	0	1	1	1
## 2016-10-16	1	1	0	1	0	0	1	1	1
## 2016-10-17	0	0	0	0	0	0	1	1	1
## 2016-10-18	0	0	1	0	1	0	1	1	1
## 2016-10-19	1	0	0	0	0	0	1	1	1

## 2016-10-20	0	1	0	0	0	0	1	1	1
## 2016-10-21	1	0	0	0	0	0	1	1	1
## 2016-10-22	1	0	0	0	0	0	1	1	1
## 2016-10-23	1	1	0	1	1	0	1	1	1
## 2016-10-24	0	1	0	0	0	0	1	1	1
## 2016-10-25	0	0	0	1	0	0	1	1	1
## 2016-10-26	0	0	0	0	0	0	1	1	1
## 2016-10-27	0	1	0	0	0	0	1	1	1
## 2016-10-28	1	0	0	0	0	0	1	1	1
## 2016-10-29	0	0	0	0	0	0	1	1	1
## 2016-10-30	0	0	0	1	0	0	1	1	1
## 2016-10-31	1	0	1	0	1	0	1	1	1
## 2016-11-01	0	0	0	0	1	0	1	1	1
## 2016-11-02	0	0	1	0	0	0	1	1	1
## 2016-11-03	0	0	0	0	1	0	1	1	1
## 2016-11-04	0	1	1	0	0	1	1	1	1
## 2016-11-05	0	0	0	0	0	0	1	1	1
## 2016-11-06	1	0	0	0	0	1	1	1	1
## 2016-11-07	0	0	1	1	0	0	1	1	1
## 2016-11-08	0	1	0	0	0	0	1	1	1
## 2016-11-09	0	0	0	1	0	0	1	1	1
## 2016-11-10	0	1	0	0	0	1	1	1	1
## 2016-11-11	0	0	0	1	0	1	1	1	1
## 2016-11-12	0	1	0	0	0	0	1	1	1
## 2016-11-13	0	1	0	0	0	0	1	1	1
## 2016-11-14	0	0	0	0	0	0	1	1	1

```
rules1 <- apriori(trans , parameter = list(supp=0.3 , conf = 0.7 , target = "rules"))
```

```
## Apriori
```

```
##
```

```
## Parameter specification:
```

```
## confidence minval smax arem aval originalSupport maxtime support minlen
##          0.7    0.1    1 none FALSE                TRUE         5     0.3     1
```

```
## maxlen target   ext
```

```
##       10 rules FALSE
```

```
##
```

```
## Algorithmic control:
```

```
## filter tree heap memopt load sort verbose
```

```
##    0.1 TRUE TRUE  FALSE TRUE     2     TRUE
```

```
##
```

```
## Absolute minimum support count: 93
```

```
##
```

```
## set item appearances ...[0 item(s)] done [0.00s].
```

```
## set transactions ...[20 item(s), 310 transaction(s)] done [0.00s].
```

```
## sorting and recoding items ... [13 item(s)] done [0.00s].
```

```
## creating transaction tree ... done [0.00s].
```

```
## checking subsets of size 1 2 3 4 done [0.00s].
```

```
## writing ... [35 rule(s)] done [0.00s].
## creating S4 object ... done [0.00s].
```

```
rules1
```

```
## set of 35 rules
```

```
inspect(sort(rules1)) #지지도와 신뢰도로 정렬
```

##	lhs	rhs	support	confidence	lift
## [1]	{프린터}	=> {TV}	0.3838710	0.7880795	1.536507
## [2]	{TV}	=> {프린터}	0.3838710	0.7484277	1.536507
## [3]	{노트북}	=> {핸드폰}	0.3838710	0.7579618	1.515924
## [4]	{핸드폰}	=> {노트북}	0.3838710	0.7677419	1.515924
## [5]	{노트북}	=> {TV}	0.3806452	0.7515924	1.465369
## [6]	{TV}	=> {노트북}	0.3806452	0.7421384	1.465369
## [7]	{프린터}	=> {핸드폰}	0.3774194	0.7748344	1.549669
## [8]	{핸드폰}	=> {프린터}	0.3774194	0.7548387	1.549669
## [9]	{프린터}	=> {노트북}	0.3741935	0.7682119	1.516852
## [10]	{노트북}	=> {프린터}	0.3741935	0.7388535	1.516852
## [11]	{연어}	=> {초밥}	0.3677419	0.7215190	1.406735
## [12]	{초밥}	=> {연어}	0.3677419	0.7169811	1.406735
## [13]	{핸드폰}	=> {TV}	0.3677419	0.7354839	1.433962
## [14]	{TV}	=> {핸드폰}	0.3677419	0.7169811	1.433962
## [15]	{고등어}	=> {초밥}	0.3645161	0.7106918	1.385626
## [16]	{초밥}	=> {고등어}	0.3645161	0.7106918	1.385626
## [17]	{노트북,프린터}	=> {핸드폰}	0.3451613	0.9224138	1.844828
## [18]	{핸드폰,프린터}	=> {노트북}	0.3451613	0.9145299	1.805760
## [19]	{노트북,핸드폰}	=> {프린터}	0.3451613	0.8991597	1.845957
## [20]	{노트북,프린터}	=> {TV}	0.3451613	0.9224138	1.798417
## [21]	{TV,프린터}	=> {노트북}	0.3451613	0.8991597	1.775411
## [22]	{TV,노트북}	=> {프린터}	0.3451613	0.9067797	1.861601
## [23]	{노트북,핸드폰}	=> {TV}	0.3419355	0.8907563	1.736695
## [24]	{TV,노트북}	=> {핸드폰}	0.3419355	0.8983051	1.796610
## [25]	{TV,핸드폰}	=> {노트북}	0.3419355	0.9298246	1.835959
## [26]	{핸드폰,프린터}	=> {TV}	0.3322581	0.8803419	1.716390

```
## [27] {TV,프린터}      => {핸드폰} 0.3322581 0.8655462 1.731092
## [28] {TV,핸드폰}        => {프린터} 0.3322581 0.9035088 1.854886
## [29] {노트북,핸드폰,프린터} => {TV}      0.3290323 0.9532710 1.858579
## [30] {TV,노트북,프린터}   => {핸드폰} 0.3290323 0.9532710 1.906542
## [31] {TV,핸드폰,프린터}   => {노트북} 0.3290323 0.9902913 1.955352
## [32] {TV,노트북,핸드폰}   => {프린터} 0.3290323 0.9622642 1.975509
## [33] {고등어,연어}       => {초밥}    0.3258065 0.9266055 1.806589
## [34] {초밥,연어}         => {고등어} 0.3258065 0.8859649 1.727353
## [35] {고등어,초밥}       => {연어}    0.3258065 0.8938053 1.753669
```

전반적으로 IT 기기끼리 또는 해산물관련 음식끼리 연관관계가 있어 보임.

```
rules2 <- subset(rules1 , subset = lhs %pin% '초밥' & confidence > 0.7)
inspect(sort(rules2))
```

```
##      lhs      rhs      support  confidence lift
## [1] {초밥}    => {연어}    0.3677419 0.7169811 1.406735
## [2] {초밥}    => {고등어} 0.3645161 0.7106918 1.385626
## [3] {초밥,연어} => {고등어} 0.3258065 0.8859649 1.727353
## [4] {고등어,초밥} => {연어} 0.3258065 0.8938053 1.753669
```

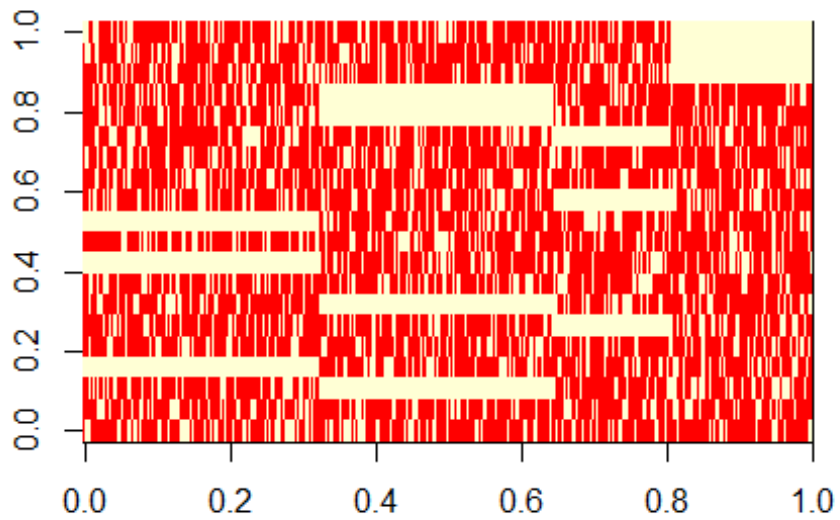
초밥은 연어나 고등어와 동조된 것이 관찰됨.

3-2) transaction plotting transaction 을 지지도와 신뢰도에 따라 plotting 한다.

```
image(trans)
#install.packages("arulesViz")
library(arulesViz)

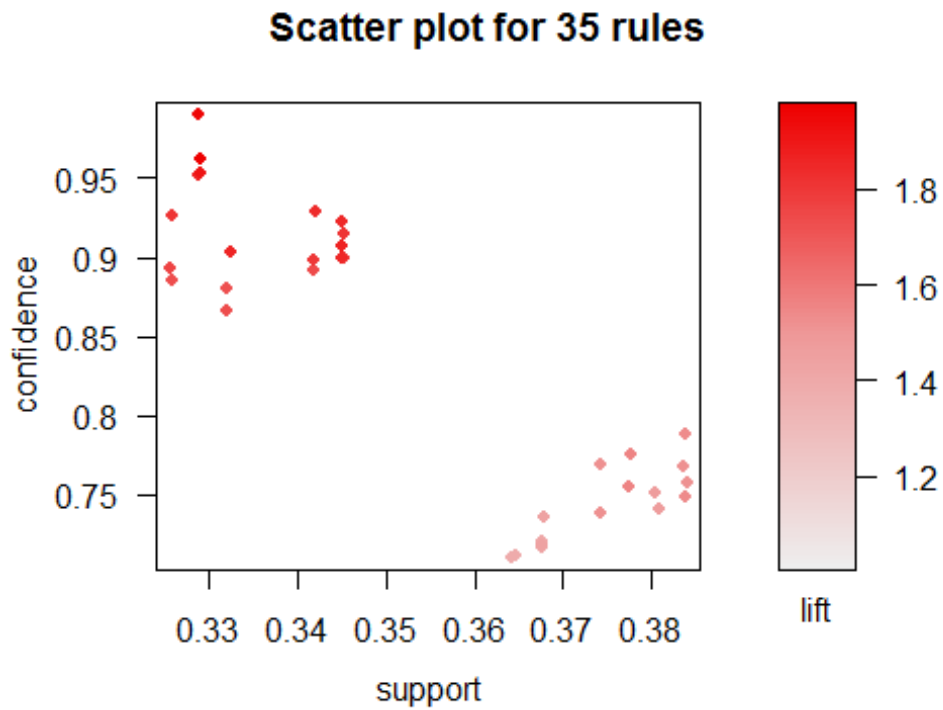
## Loading required package: grid

image(trans)
```



3-3-1) rule plotting rule 을 지지도와 신뢰도에 따라 plotting 한다.

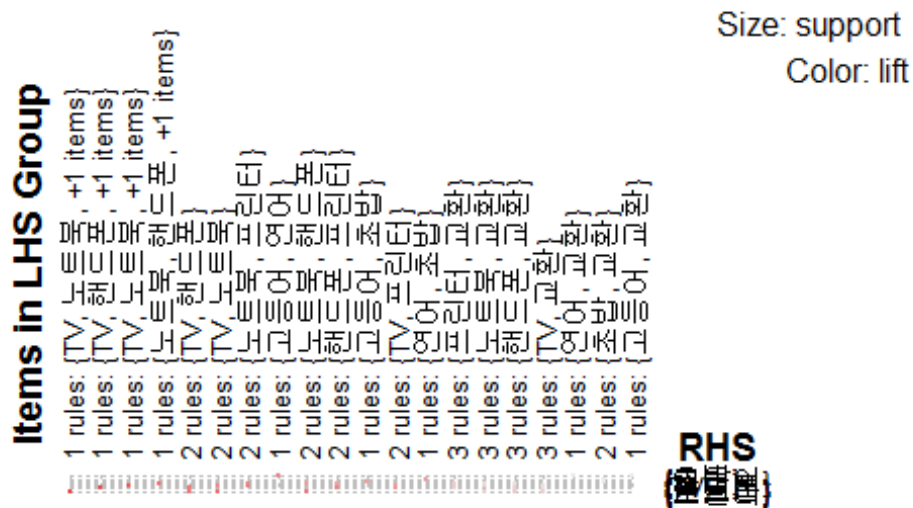
```
#install.packages("arulesViz")  
library(arulesViz)  
plot(rules1)
```

3-3-2) rule plotting: bubble chart bubble chart 에서 원의 크기는 지지도 색깔이 진할수록 lift 가 커져서 신뢰도가 높다.

```
plot(rules1 , method = "grouped")
```

Grouped Matrix for 35 Rules

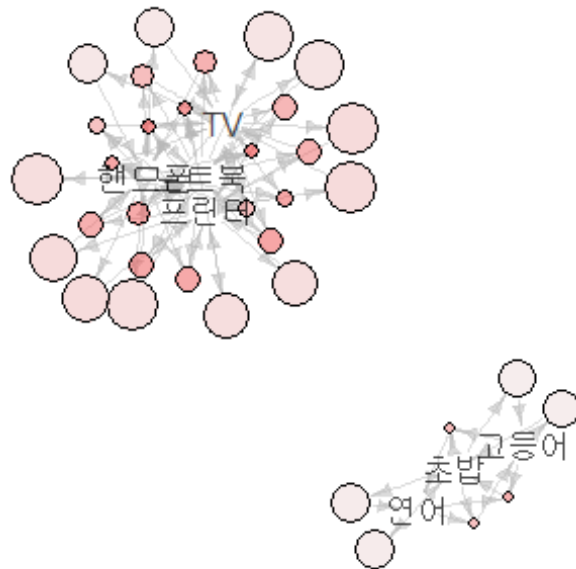


3-3-2) rule plotting: Social network map 서로 연관성 있는 단어끼리 선분이 맺어진다.
원의 크기는 지지도를 의미하고 색깔은 lift(향상도)를 나타냄.

```
plot(rules1 , method = "graph" , control = list(type = "items"))
```

Graph for 35 rules

size: support (0.326 - 0.384)
color: lift (1.386 - 1.976)



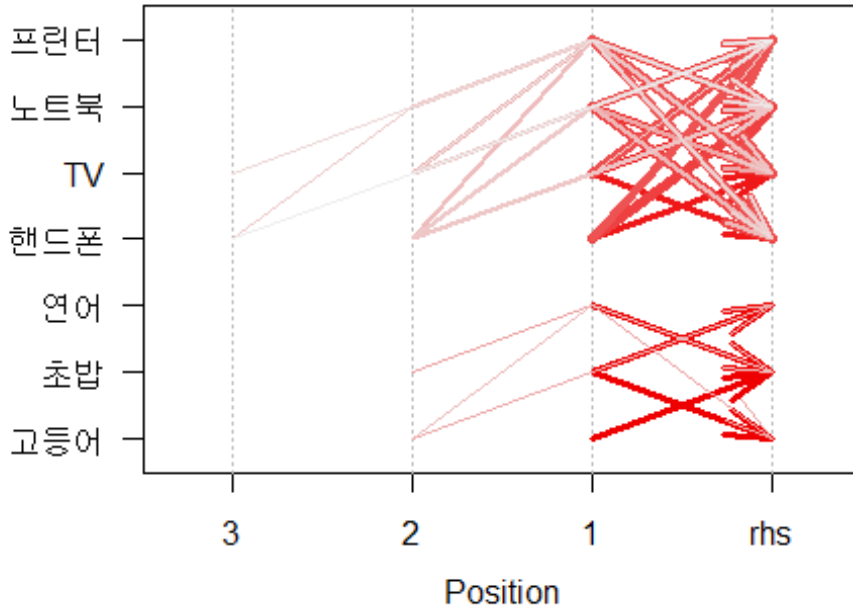
키워드끼리 군집을

형성하는 모습까지 관찰할 수 있음.

3-3-3) rule plotting: 평행좌표그래프

```
plot(rules1 , method = "paracoord" , control = list(reorder = TRUE))
```

Parallel coordinates plot for 35 rules



{프린터,노트북,TV,핸드폰}의 집합끼리 상관관계가 강하고 {dusdj,chqkq,rhemddj} 집합내의 원소들끼리 상관관계가 강하다는 것을 유추가 가능.

4) Correlation

`cor(advice2)`

##		교환	포장	TV	고등어	곰팡이
##	교환	1.000000000	0.017333440	0.007693383	0.044733006	0.010257382
##	포장	0.017333440	1.000000000	-0.074393848	0.103142576	-0.022871552
##	TV	0.007693383	-0.074393848	1.000000000	-0.358587672	0.018686593
##	고등어	0.044733006	0.103142576	-0.358587672	1.000000000	-0.045686205
##	곰팡이	0.010257382	-0.022871552	0.018686593	-0.045686205	1.000000000
##	구두	-0.059209970	-0.010742169	-0.215217238	-0.241330475	-0.029165464
##	노트북	0.027699864	-0.129471256	0.758629142	-0.391742693	0.019268427
##	라면	-0.038644938	-0.006906307	0.021185231	-0.022677640	-0.013159357
##	초밥	0.115651901	0.086182124	-0.360458831	0.768621464	-0.048220405
##	스팸	0.078501132	0.050894298	0.068082299	-0.050487902	0.085766772
##	연어	0.119417499	0.135828925	-0.364122075	0.709310030	0.037109048
##	신사복	-0.048382711	-0.035469828	-0.258147802	-0.230344500	-0.055305099

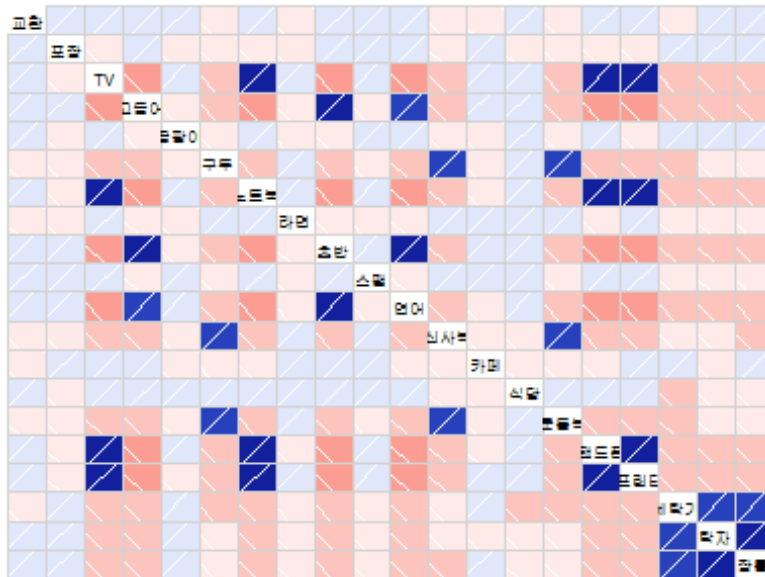
## 카페	-0.067550684	0.016878634	0.028949555	0.001128607	-0.065046087
## 식당	0.085675504	-0.090488406	0.052425933	0.094656480	0.033394708
## 운동복	-0.049125148	-0.003137005	-0.219817566	-0.219884387	-0.099734906
## 핸드폰	0.042593335	-0.079561619	0.724622839	-0.331951426	0.079209754
## 프린터	0.020869548	-0.100517145	0.745968905	-0.357395593	-0.001248288
## 세탁기	-0.101276970	0.024349064	-0.235891915	-0.230782506	0.107983222
## 탁자	0.020337750	0.047193217	-0.212345214	-0.234787206	0.071347591
## 장롱	0.013769265	0.045498279	-0.211760410	-0.222394522	0.046485379
##	구두	노트북	라면	초밥	스팸
## 교환	-0.059209970	0.027699864	-0.0386449381	0.11565190	0.078501132
## 포장	-0.010742169	-0.129471256	-0.0069063071	0.08618212	0.050894298
## TV	-0.215217238	0.758629142	0.0211852306	-0.36045883	0.068082299
## 고등어	-0.241330475	-0.391742693	-0.0226776403	0.76862146	-0.050487902
## 곰팡이	-0.029165464	0.019268427	-0.0131593575	-0.04822041	0.085766772
## 구두	1.000000000	-0.203970342	0.0695840744	-0.22196306	-0.017674961
## 노트북	-0.203970342	1.000000000	0.0046213792	-0.37378347	0.058312813
## 라면	0.069584074	0.004621379	1.000000000	-0.04172682	-0.129069761
## 초밥	-0.221963059	-0.373783470	-0.0417268165	1.00000000	0.033348016
## 스팸	-0.017674961	0.058312813	-0.1290697613	0.03334802	1.000000000
## 연어	-0.224552374	-0.363580941	-0.0223731146	0.77372316	-0.025177549
## 신사복	0.674425954	-0.222369087	0.0373279779	-0.25113426	0.003475228
## 카페	-0.008585199	-0.029886213	0.0006511214	0.01008662	0.011338626
## 식당	0.004432589	0.050409606	0.0140098705	0.09884836	0.009358684
## 운동복	0.688416978	-0.180930702	0.0684675115	-0.23799125	-0.046064664
## 핸드폰	-0.222416247	0.753273947	-0.0044684632	-0.31979385	0.112932448
## 프린터	-0.222689589	0.756074451	0.0442200338	-0.35206667	0.046292410
## 세탁기	-0.159600307	-0.261477528	-0.1330428976	-0.23690246	-0.003831652
## 탁자	-0.103980930	-0.261663153	-0.0592913807	-0.24779566	-0.079619440
## 장롱	-0.126702539	-0.240231630	-0.1308319497	-0.27561782	-0.086271212
##	연어	신사복	카페	식당	운동복
## 교환	0.11941750	-0.048382711	-0.0675506842	0.085675504	-0.049125148
## 포장	0.13582892	-0.035469828	0.0168786341	-0.090488406	-0.003137005
## TV	-0.36412208	-0.258147802	0.0289495550	0.052425933	-0.219817566
## 고등어	0.70931003	-0.230344500	0.0011286066	0.094656480	-0.219884387

## 곰팡이	0.03710905	-0.055305099	-0.0650460870	0.033394708	-0.099734906
## 구두	-0.22455237	0.674425954	-0.0085851991	0.004432589	0.688416978
## 노트북	-0.36358094	-0.222369087	-0.0298862133	0.050409606	-0.180930702
## 라면	-0.02237311	0.037327978	0.0006511214	0.014009871	0.068467512
## 초밥	0.77372316	-0.251134260	0.0100866247	0.098848358	-0.237991252
## 스팸	-0.02517755	0.003475228	0.0113386260	0.009358684	-0.046064664
## 연어	1.00000000	-0.232640503	-0.0320167265	0.061839524	-0.242994852
## 신사복	-0.23264050	1.000000000	-0.0086884036	-0.031970150	0.707159942
## 카페	-0.03201673	-0.008688404	1.0000000000	-0.003008265	-0.005371720
## 식당	0.06183952	-0.031970150	-0.0030082649	1.000000000	0.003164278
## 운동복	-0.24299485	0.707159942	-0.0053717203	0.003164278	1.000000000
## 핸드폰	-0.31746029	-0.257943640	-0.0355767274	0.074653720	-0.234491735
## 프린터	-0.34802032	-0.233640853	0.0417611150	0.004810296	-0.222590012
## 세탁기	-0.22956900	-0.126269534	0.0287290727	-0.144195569	-0.152340940
## 탁자	-0.25966463	-0.124792126	-0.0406353669	-0.130774921	-0.135523533
## 장롱	-0.25567862	-0.142950089	0.0094363503	-0.116090435	-0.127552679
##	핸드폰	프린터	세탁기	탁자	장롱
## 교환	0.042593335	0.020869548	-0.101276970	0.02033775	0.01376927
## 포장	-0.079561619	-0.100517145	0.024349064	0.04719322	0.04549828
## TV	0.724622839	0.745968905	-0.235891915	-0.21234521	-0.21176041
## 고등어	-0.331951426	-0.357395593	-0.230782506	-0.23478721	-0.22239452
## 곰팡이	0.079209754	-0.001248288	0.107983222	0.07134759	0.04648538
## 구두	-0.222416247	-0.222689589	-0.159600307	-0.10398093	-0.12670254
## 노트북	0.753273947	0.756074451	-0.261477528	-0.26166315	-0.24023163
## 라면	-0.004468463	0.044220034	-0.133042898	-0.05929138	-0.13083195
## 초밥	-0.319793851	-0.352066669	-0.236902465	-0.24779566	-0.27561782
## 스팸	0.112932448	0.046292410	-0.003831652	-0.07961944	-0.08627121
## 연어	-0.317460290	-0.348020321	-0.229568998	-0.25966463	-0.25567862
## 신사복	-0.257943640	-0.233640853	-0.126269534	-0.12479213	-0.14295009
## 카페	-0.035576727	0.041761115	0.028729073	-0.04063537	0.00943635
## 식당	0.074653720	0.004810296	-0.144195569	-0.13077492	-0.11609044
## 운동복	-0.234491735	-0.222590012	-0.152340940	-0.13552353	-0.12755268
## 핸드폰	1.000000000	0.731821130	-0.271844867	-0.28090269	-0.25292925

```
## 프린터  0.731821130  1.000000000 -0.272072052 -0.27805886 -0.24870630
## 세탁기 -0.271844867 -0.272072052  1.000000000  0.69314300  0.68959504
## 탁자   -0.280902688 -0.278058861  0.693142997  1.000000000  0.71706507
## 장롱   -0.252929253 -0.248706298  0.689595041  0.71706507  1.000000000
```

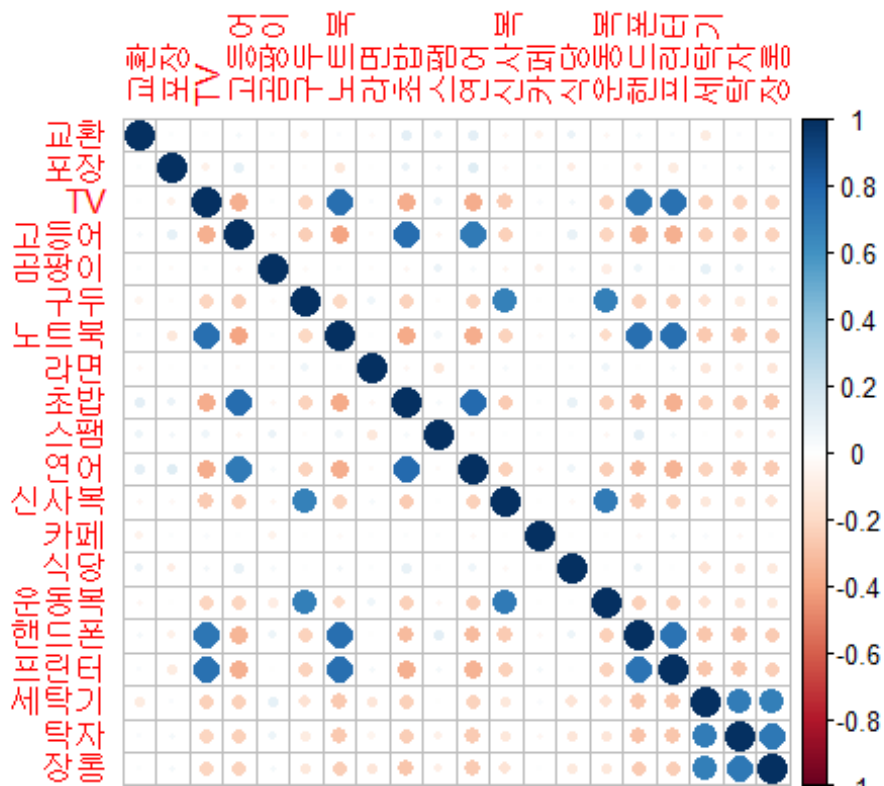
4-1-1) correlation plot: corrgram

```
#install.packages("corrgram")
library(corrgram)
corrgram(cor(advice2))
```



4-1-2) correlation plot: corrplot

```
#install.packages("corrplot")
library(corrplot)
corrplot(cor(advice2))
```



4-1-3) correlation plot: social network map

```
library(sna)
```

```
## Loading required package: statnet.common
```

```
## Loading required package: network
```

```
## network: Classes for Relational Data
```

```
## Version 1.13.0 created on 2015-08-31.
```

```
## copyright (c) 2005, Carter T. Butts, University of California-Irvine
```

```
## Mark S. Handcock, University of California -- Los Angeles
```

```
## David R. Hunter, Penn State University
```

```
## Martina Morris, University of Washington
```

```
## Skye Bender-deMoll, University of Washington
```

```
## For citation information, type citation("network").
```

```
## Type help("network-package") to get started.
```

```
## sna: Tools for Social Network Analysis
```

```
## Version 2.4 created on 2016-07-23.
```

```
## copyright (c) 2005, Carter T. Butts, University of California-Irvine
```

```
## For citation information, type citation("sna").
```

```
## Type help(package="sna") to get started.
```



```
library(rgl)
advice_square <- t(as.matrix(advice2)) %*% as.matrix(advice2)
advice_square
```

##	교환	포장	TV	고등어	곰팡이	구두	노트북	라면	초밥	스팸
## 교환	44495	32664	62216	64060	31889	45119	63363	31398	67490	32160
## 포장	32664	41724	58046	63808	30589	44918	56992	30830	64607	30908
## TV	62216	58046	193996	88022	59415	72376	176281	59645	89122	59980
## 고등어	64060	63808	88022	195749	58204	71859	86254	59008	182144	57159
## 곰팡이	31889	30589	59415	58204	41642	43470	59959	30079	59240	30677
## 구두	45119	44918	72376	71859	43470	116815	73782	46039	74288	43076
## 노트북	63363	56992	176281	86254	59959	73782	197041	59655	88898	60214
## 라면	31398	30830	59645	59008	30079	46039	59655	42509	59540	28257
## 초밥	67490	64607	89122	182144	59240	74288	88898	59540	206135	60827
## 스팸	32160	30908	59980	57159	30677	43076	60214	28257	60827	40505
## 연어	65602	64089	87273	170589	60122	72512	88163	58501	179898	57404
## 신사복	45770	44737	69914	72921	43195	101491	72961	45659	72680	43989
## 카페	32069	32011	61599	61533	30422	45411	60422	31221	63004	30788
## 식당	30722	28004	56710	58572	28664	41555	57152	28523	59884	27967
## 운동복	45236	45029	71217	72367	41556	102395	74535	46043	72276	42271
## 핸드폰	64782	59282	176719	92123	62733	73557	180487	60267	94498	62821
## 프린터	60432	55146	170666	83632	56742	68662	172842	58304	85234	57309
## 세탁기	48989	50580	79651	81265	51656	62982	78679	45529	82178	48060
## 탁자	51101	50264	78802	78489	49912	64416	76067	46491	78815	45171
## 장롱	49341	48591	77634	78178	47641	61778	76577	43454	76073	43803
##	연어	신사복	카페	식당	운동복	핸드폰	프린터	세탁기	탁자	장롱
## 교환	65602	45770	32069	30722	45236	64782	60432	48989	51101	49341
## 포장	64089	44737	32011	28004	45029	59282	55146	50580	50264	48591
## TV	87273	69914	61599	56710	71217	176719	170666	79651	78802	77634
## 고등어	170589	72921	61533	58572	72367	92123	83632	81265	78489	78178
## 곰팡이	60122	43195	30422	28664	41556	62733	56742	51656	49912	47641
## 구두	72512	101491	45411	41555	102395	73557	68662	62982	64416	61778
## 노트북	88163	72961	60422	57152	74535	180487	172842	78679	76067	76577
## 라면	58501	45659	31221	28523	46043	60267	58304	45529	46491	43454
## 초밥	179898	72680	63004	59884	72276	94498	85234	82178	78815	76073

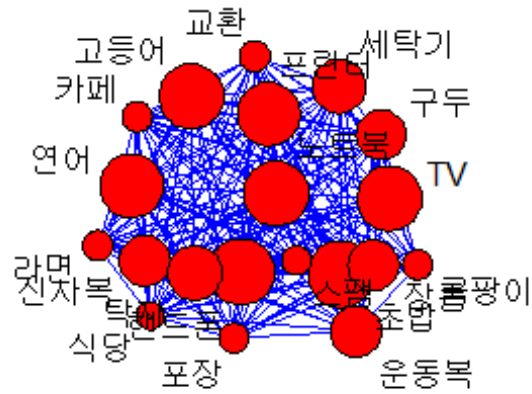
```
## 스팸      57404  43989 30788 27967  42271  62821  57309  48060  45171  43803
## 연어     189747  72370 60049 57098  70449  92885  84080  80868  76369  75701
## 신사복   72370 121154 45820 41070 105170  71505  68257  65241  63667  61368
## 카페     60049  45820 42835 29186  45419  61157  59850  51197  48520  48263
## 식당     57098  41070 29186 36831  41474  58742  53410  42413  41745  41064
## 운동복   70449 105170 45419 41474 122309  71817  67789  62842  62123  61303
## 핸드폰   92885  71505 61157 58742  71817 204526 174002  78995  75662  76785
## 프린터  84080  68257 59850 53410  67789 174002 188284  73620  70633  71925
## 세탁기   80868  65241 51197 42413  62842  78995  73620 135716 118798 111646
## 탁자     76369  63667 48520 41745  62123  75662  70633 118798 138297 113483
## 장롱     75701  61368 48263 41064  61303  76785  71925 111646 113483 120616
```

```
gplot(sqrt(sqrt(advice_square)) , displaylabel=T , vertex.cex=sqrt(diag(advice_square))*0.01 , label=rownames(advice_square) , edge.col="blue" , boxed.labels=F , arrowhead.cex=0.01 , edge.lwd=0.01 , vertex.alpha=0.01)
```

```
## Warning in plot.window(...): "vertex.alpha"는 그래픽 매개변수가 아닙니다
```

```
## Warning in plot.xy(xy, type, ...): "vertex.alpha"는 그래픽 매개변수가 아닙니다
## 니다
```

```
## Warning in title(...): "vertex.alpha"는 그래픽 매개변수가 아닙니다
```



5. 시계열 패턴 분석

```
library(zoo)
```

##

```
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
```

##

```
##      as.Date, as.Date.numeric
```

```
dates <- as.Date(rownames(advice2) , format = "%Y-%m-%d")
```

```
time_keywords <- zoo(advice2 , dates)
```

time_keywords

교환 포장 TV 고등어 곰팡이 구두 노트북 라면 초밥 스팸 연어

##	2016-01-10	0	0	2	30	13	5	4	4	20	3	38
----	------------	---	---	---	----	----	---	---	---	----	---	----

##	2016-01-11	19	12	13	52	12	1	10	0	60	8	34
----	------------	----	----	----	----	----	---	----	---	----	---	----

##	2016-01-12	18	7	16	32	20	9	16	20	34	4	43
----	------------	----	---	----	----	----	---	----	----	----	---	----

##	2016-01-13	1	4	3	40	2	7	14	15	34	1	34
----	------------	---	---	---	----	---	---	----	----	----	---	----

```
## 2016-01-14      6      0 19      52      0      1      11      12      22      11      24
```

##	2016-01-15	1	8	12	32	1	3	6	13	50	11	45
----	------------	---	---	----	----	---	---	---	----	----	----	----

##	2016-01-16	8	16	16	51	0	13	15	18	30	6	32
----	------------	---	----	----	----	---	----	----	----	----	---	----

##	2016-01-17	10	17	11	39	10	5	18	14	25	5	40
----	------------	----	----	----	----	----	---	----	----	----	---	----

```
## 2016-01-18      6    19 16      25      5    20      5    19    23      2    45
```

```
## 2016-01-19      5      13      0      53      12      13      3      19      37      2      27
```

## 2016-01-20	6	14	20	43	18	2	8	19	29	4	21
## 2016-01-21	8	15	11	42	18	17	7	11	50	11	42
## 2016-01-22	8	7	4	54	17	0	4	12	44	8	44
## 2016-01-23	8	7	18	35	2	19	6	14	49	0	33
## 2016-01-24	18	14	9	42	14	4	15	15	31	0	46
## 2016-01-25	15	6	3	40	1	19	6	11	53	6	40
## 2016-01-26	4	18	6	37	9	14	2	9	42	18	44
## 2016-01-27	7	7	9	46	14	12	9	6	49	17	25
## 2016-01-28	1	13	7	49	19	16	17	2	58	18	49
## 2016-01-29	17	11	15	43	4	1	0	12	52	8	28
## 2016-01-30	2	18	9	59	10	2	1	5	37	1	58
## 2016-01-31	20	10	7	27	4	4	19	0	46	10	28
## 2016-02-01	18	13	14	37	14	6	19	13	28	5	48
## 2016-02-02	1	3	14	43	5	11	19	3	39	13	37
## 2016-02-03	16	15	0	49	14	6	9	2	30	17	22
## 2016-02-04	7	16	17	47	2	14	7	19	45	2	28
## 2016-02-05	14	13	4	27	12	19	10	18	35	16	47
## 2016-02-06	11	17	11	60	14	16	0	12	56	12	20
## 2016-02-07	11	13	3	58	19	6	6	17	24	19	37
## 2016-02-08	4	15	17	31	9	3	5	6	24	4	30
## 2016-02-09	14	3	9	40	8	16	1	0	52	2	45
## 2016-02-10	12	6	14	27	15	2	4	3	33	16	42
## 2016-02-11	19	14	19	28	17	4	15	12	55	11	45
## 2016-02-12	9	8	2	46	13	1	13	17	23	4	39
## 2016-02-13	14	13	8	46	1	11	0	1	29	10	29
## 2016-02-14	12	9	11	26	1	18	19	14	49	8	22
## 2016-02-15	20	2	2	42	6	10	15	7	49	20	37
## 2016-02-16	2	18	6	55	2	18	15	15	45	16	54
## 2016-02-17	14	20	1	23	14	12	19	5	49	8	29
## 2016-02-18	11	18	19	28	2	13	14	19	56	6	26
## 2016-02-19	5	15	12	30	19	5	17	20	34	0	44
## 2016-02-20	16	10	6	45	9	15	20	3	33	0	24
## 2016-02-21	18	12	15	30	18	5	1	7	42	17	35
## 2016-02-22	17	13	11	44	15	11	10	3	46	20	37
## 2016-02-23	16	0	1	39	16	5	11	4	59	12	41
## 2016-02-24	3	19	2	36	0	4	19	15	32	3	41
## 2016-02-25	19	0	11	37	17	9	9	3	54	15	36
## 2016-02-26	14	12	3	33	7	6	0	14	44	17	21
## 2016-02-27	3	13	2	57	5	9	13	3	49	16	60
## 2016-02-28	1	15	8	32	2	15	1	2	23	14	29
## 2016-02-29	10	14	9	48	2	14	20	13	52	5	26
## 2016-03-01	17	5	7	48	4	6	13	5	30	18	26
## 2016-03-02	11	11	16	38	18	1	19	17	22	6	21
## 2016-03-03	14	17	3	25	18	4	0	18	56	7	41
## 2016-03-04	17	7	8	22	7	13	6	6	40	16	56
## 2016-03-05	4	4	11	23	15	15	13	16	51	0	40
## 2016-03-06	18	11	0	44	7	4	19	11	48	11	34
## 2016-03-07	14	2	4	58	8	2	10	20	32	1	22
## 2016-03-08	1	16	15	22	6	14	7	12	31	5	56

## 2016-03-09	8	12	17	30	3	12	8	3	57	9	37
## 2016-03-10	16	16	19	59	7	3	12	0	53	12	46
## 2016-03-11	3	1	6	25	16	11	10	15	37	10	34
## 2016-03-12	1	5	1	30	16	19	7	4	34	5	35
## 2016-03-13	17	2	8	25	0	3	14	20	35	17	23
## 2016-03-14	14	11	17	20	10	20	9	19	38	16	58
## 2016-03-15	10	15	5	40	10	9	17	0	48	11	48
## 2016-03-16	1	18	9	31	20	9	15	3	55	15	55
## 2016-03-17	5	10	12	31	14	14	0	14	34	8	39
## 2016-03-18	20	2	2	38	11	8	2	5	38	10	60
## 2016-03-19	11	1	6	48	0	18	10	2	51	18	23
## 2016-03-20	19	14	11	38	11	9	16	14	57	7	53
## 2016-03-21	11	16	12	37	1	11	5	7	42	5	54
## 2016-03-22	7	17	6	35	6	9	8	17	31	8	24
## 2016-03-23	0	16	7	29	15	18	10	14	32	7	41
## 2016-03-24	11	6	0	33	14	6	7	15	44	4	44
## 2016-03-25	12	2	18	47	12	1	5	12	45	4	43
## 2016-03-26	9	7	3	37	4	19	1	12	50	19	27
## 2016-03-27	20	7	5	26	1	5	9	16	48	11	44
## 2016-03-28	14	18	6	25	17	8	6	4	26	17	60
## 2016-03-29	19	1	9	38	5	19	4	17	39	16	58
## 2016-03-30	5	11	18	44	7	7	9	12	26	9	22
## 2016-03-31	18	10	14	56	17	5	10	8	44	9	46
## 2016-04-01	16	17	1	53	5	12	7	6	22	6	47
## 2016-04-02	19	18	0	27	5	15	10	20	45	8	60
## 2016-04-03	13	5	0	27	4	5	7	12	24	3	34
## 2016-04-04	4	18	20	56	6	17	16	9	51	9	39
## 2016-04-05	19	14	19	30	3	5	2	1	50	6	34
## 2016-04-06	19	6	17	55	8	2	16	4	48	19	55
## 2016-04-07	16	7	20	52	18	9	5	19	21	13	23
## 2016-04-08	19	13	9	43	19	18	3	6	53	8	52
## 2016-04-09	8	20	13	50	19	20	8	0	50	6	48
## 2016-04-10	20	1	7	39	20	9	9	12	53	13	48
## 2016-04-11	8	20	20	56	7	15	1	0	30	19	31
## 2016-04-12	8	11	4	30	11	11	16	16	44	2	52
## 2016-04-13	15	16	11	24	7	0	1	0	30	11	45
## 2016-04-14	18	18	5	57	6	4	1	6	46	16	53
## 2016-04-15	10	9	18	57	6	14	1	9	31	1	29
## 2016-04-16	18	20	11	35	8	4	8	20	37	11	27
## 2016-04-17	13	12	16	40	1	14	1	6	53	9	25
## 2016-04-18	0	8	2	45	9	1	12	12	54	15	23
## 2016-04-19	8	1	22	6	0	6	59	2	17	3	9
## 2016-04-20	7	1	23	1	20	7	50	6	4	8	12
## 2016-04-21	3	10	24	4	17	10	22	12	10	7	17
## 2016-04-22	20	10	29	7	18	6	46	3	17	17	16
## 2016-04-23	12	7	32	11	10	16	41	20	8	8	14
## 2016-04-24	15	12	47	6	12	10	47	10	6	4	16
## 2016-04-25	14	9	51	2	7	16	35	12	16	0	2
## 2016-04-26	0	13	32	20	1	17	59	2	17	6	7

## 2016-04-27	12	10	23	9	7	9	45	7	1	10	18
## 2016-04-28	19	17	25	1	8	3	43	18	13	11	9
## 2016-04-29	6	4	35	0	7	17	39	8	20	10	13
## 2016-04-30	15	8	39	16	3	13	46	11	11	4	11
## 2016-05-01	17	2	52	3	14	14	54	20	15	3	8
## 2016-05-02	17	18	36	7	6	15	50	3	5	18	18
## 2016-05-03	3	10	41	7	2	1	35	20	9	18	1
## 2016-05-04	18	6	36	4	8	18	41	19	7	16	10
## 2016-05-05	13	19	20	11	20	11	21	13	13	4	4
## 2016-05-06	17	15	58	7	17	2	42	2	1	14	5
## 2016-05-07	19	14	36	11	3	12	41	4	17	6	4
## 2016-05-08	17	20	48	16	15	1	46	8	10	11	2
## 2016-05-09	8	0	49	16	4	6	23	9	0	3	2
## 2016-05-10	3	14	29	0	7	5	25	14	12	16	13
## 2016-05-11	12	3	52	15	8	6	49	14	6	20	20
## 2016-05-12	4	12	28	15	17	16	56	12	8	13	13
## 2016-05-13	16	11	50	2	3	3	51	10	14	19	7
## 2016-05-14	17	11	26	3	12	12	38	16	7	10	0
## 2016-05-15	6	8	50	9	13	16	48	15	1	1	13
## 2016-05-16	9	7	21	12	11	13	25	14	19	18	6
## 2016-05-17	14	5	53	18	13	5	27	20	14	2	9
## 2016-05-18	0	12	44	19	12	13	20	17	8	5	17
## 2016-05-19	19	3	36	19	13	8	31	2	14	2	18
## 2016-05-20	5	17	25	19	10	18	30	1	6	12	10
## 2016-05-21	6	17	36	5	17	18	29	13	15	19	4
## 2016-05-22	7	6	31	14	3	13	53	0	1	7	3
## 2016-05-23	7	7	49	2	5	0	46	19	18	18	14
## 2016-05-24	12	7	20	0	13	11	54	13	1	17	5
## 2016-05-25	16	0	34	9	17	13	26	3	14	20	10
## 2016-05-26	3	15	20	16	19	0	26	15	7	20	14
## 2016-05-27	17	4	46	11	2	0	49	8	20	16	20
## 2016-05-28	20	2	50	6	4	16	58	18	7	1	20
## 2016-05-29	18	20	41	19	0	8	54	1	12	3	8
## 2016-05-30	13	15	60	7	1	9	44	6	7	19	12
## 2016-05-31	17	11	48	7	9	17	33	15	5	9	15
## 2016-06-01	6	6	52	19	15	9	43	5	9	15	5
## 2016-06-02	5	6	58	9	14	2	53	3	19	0	10
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##	신사복 카페 식당 운동복 핸드폰 프린터 세탁기 탁자 장롱											
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## 2016-05-03	19	20	14	19	23	37	16	5	14
## 2016-05-04	15	14	16	19	56	46	6	19	12
## 2016-05-05	19	7	11	4	47	60	17	3	12
## 2016-05-06	4	9	10	0	57	23	14	10	19
## 2016-05-07	6	5	18	13	53	39	5	18	12
## 2016-05-08	5	8	4	10	21	28	4	18	5
## 2016-05-09	7	18	17	3	49	48	3	10	17
## 2016-05-10	16	7	1	20	47	38	14	19	16
## 2016-05-11	16	2	14	1	56	35	12	9	2
## 2016-05-12	0	19	12	9	32	57	7	4	1
## 2016-05-13	1	0	16	13	52	45	12	10	0
## 2016-05-14	9	12	8	14	35	34	20	15	20
## 2016-05-15	11	8	3	5	36	42	7	6	11
## 2016-05-16	4	2	1	4	48	39	19	16	3
## 2016-05-17	4	12	15	20	35	22	19	15	11
## 2016-05-18	1	11	15	7	52	59	14	2	3
## 2016-05-19	4	13	5	19	50	46	11	0	4
## 2016-05-20	15	18	16	17	50	26	9	4	14
## 2016-05-21	19	2	19	5	34	22	11	12	15
## 2016-05-22	1	1	3	20	47	28	2	3	20
## 2016-05-23	14	14	3	15	26	59	18	18	5
## 2016-05-24	4	2	9	1	20	49	7	10	7
## 2016-05-25	19	7	8	1	27	25	12	6	7
## 2016-05-26	5	2	6	8	54	33	17	16	9
## 2016-05-27	4	5	3	13	52	51	20	7	20

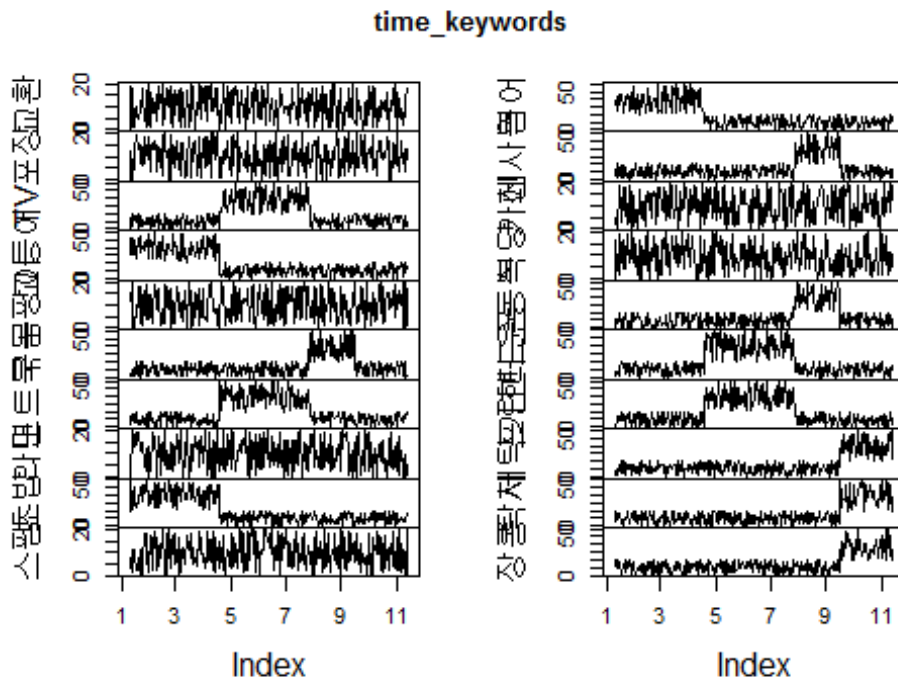
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## 2016-05-29	19	13	10	2	22	40	16	13	8
## 2016-05-30	9	18	15	17	24	39	3	3	14
## 2016-05-31	10	11	15	2	28	40	8	1	16
## 2016-06-01	2	16	9	16	49	33	14	4	18
## 2016-06-02	7	17	15	0	57	46	18	9	10
## 2016-06-03	10	11	1	17	25	31	10	1	10
## 2016-06-04	18	11	6	3	32	22	0	20	17
## 2016-06-05	0	11	6	14	30	36	5	0	8
## 2016-06-06	8	10	18	4	40	53	5	4	11
## 2016-06-07	17	5	5	12	32	58	11	15	18
## 2016-06-08	3	0	9	9	27	45	7	13	10
## 2016-06-09	1	9	16	14	47	36	5	6	19
## 2016-06-10	4	13	17	16	38	21	12	4	17
## 2016-06-11	18	3	13	3	30	31	3	3	15
## 2016-06-12	16	17	5	3	57	28	2	13	4
## 2016-06-13	17	12	18	2	57	39	1	14	20
## 2016-06-14	14	9	0	19	37	57	10	2	20
## 2016-06-15	12	19	10	9	33	50	15	8	10
## 2016-06-16	13	17	6	0	20	58	4	12	19
## 2016-06-17	4	0	10	13	42	36	16	5	11
## 2016-06-18	5	10	8	1	27	47	12	1	3
## 2016-06-19	2	17	10	8	48	30	8	5	5
## 2016-06-20	6	2	0	8	38	54	15	19	12
## 2016-06-21	12	11	9	20	43	34	2	5	16
## 2016-06-22	17	1	19	1	36	32	14	7	9
## 2016-06-23	14	9	13	0	32	55	11	4	2
## 2016-06-24	16	4	4	6	40	40	13	11	20
## 2016-06-25	4	3	11	8	32	25	0	16	2
## 2016-06-26	9	19	8	1	28	34	4	14	13
## 2016-06-27	4	6	12	15	57	30	19	8	9
## 2016-06-28	15	20	1	1	24	59	18	11	14
## 2016-06-29	9	8	6	5	51	22	11	3	6
## 2016-06-30	9	17	7	6	22	28	15	11	15
## 2016-07-01	18	18	0	19	52	22	0	19	19
## 2016-07-02	17	7	5	11	50	23	10	9	13
## 2016-07-03	1	4	1	13	36	41	14	12	12
## 2016-07-04	19	3	16	5	52	39	2	3	6
## 2016-07-05	16	8	10	4	30	29	6	13	2
## 2016-07-06	18	5	7	18	25	47	20	0	10
## 2016-07-07	13	0	12	20	49	34	6	5	20
## 2016-07-08	10	6	15	0	35	27	12	2	14
## 2016-07-09	1	6	8	17	41	53	11	9	2
## 2016-07-10	20	6	16	9	27	26	2	13	0
## 2016-07-11	8	20	6	20	34	60	17	16	12
## 2016-07-12	10	16	13	20	38	47	15	14	8
## 2016-07-13	13	16	8	0	58	31	5	1	5
## 2016-07-14	2	15	1	1	34	52	13	20	1
## 2016-07-15	11	5	5	18	43	42	18	11	7

## 2016-07-16	20	4	6	17	24	32	12	18	16
## 2016-07-17	4	17	11	15	38	53	6	2	4
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## 2016-07-19	5	9	9	9	57	34	0	14	6
## 2016-07-20	19	1	8	3	37	24	5	13	17
## 2016-07-21	13	18	11	2	45	24	1	7	6
## 2016-07-22	19	18	15	8	52	47	7	11	0
## 2016-07-23	8	9	4	16	23	29	2	20	8
## 2016-07-24	2	3	10	19	42	45	7	1	1
## 2016-07-25	10	20	6	12	28	43	5	2	2
## 2016-07-26	6	19	17	13	30	51	8	7	19
## 2016-07-27	0	13	16	18	48	50	14	1	3
## 2016-07-28	29	6	15	37	8	14	16	6	14
## 2016-07-29	48	1	7	25	20	19	14	20	15
## 2016-07-30	22	12	20	60	16	13	7	14	14
## 2016-07-31	33	6	9	35	10	3	3	10	18
## 2016-08-01	39	7	9	36	5	7	5	3	4
## 2016-08-02	43	13	9	27	18	15	8	8	12
## 2016-08-03	36	9	3	56	16	4	19	13	1
## 2016-08-04	23	16	8	33	12	3	13	15	6
## 2016-08-05	57	7	16	41	4	20	0	13	18
## 2016-08-06	37	14	13	34	5	3	8	3	8
## 2016-08-07	36	20	19	52	11	19	20	12	6
## 2016-08-08	28	1	19	36	16	7	1	16	13
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## 2016-08-10	30	19	11	25	1	12	18	3	0
## 2016-08-11	60	9	12	59	10	1	17	14	7
## 2016-08-12	39	5	13	47	8	5	9	18	19
## 2016-08-13	20	17	4	45	4	11	12	15	13
## 2016-08-14	59	1	12	42	4	3	14	2	7
## 2016-08-15	36	4	11	45	12	8	12	15	15
## 2016-08-16	48	6	9	54	5	2	3	5	5
## 2016-08-17	23	12	9	57	20	5	5	15	9
## 2016-08-18	57	2	18	32	19	10	15	12	1
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## 2016-08-20	22	9	13	22	3	5	5	12	17
## 2016-08-21	58	9	4	21	9	18	15	0	10
## 2016-08-22	20	10	2	22	6	8	11	7	20
## 2016-08-23	49	13	0	31	13	15	17	6	4
## 2016-08-24	40	14	2	42	0	5	4	20	17
## 2016-08-25	41	15	5	25	19	19	3	14	20
## 2016-08-26	34	19	12	23	6	8	7	5	1
## 2016-08-27	36	19	5	57	0	18	9	8	10
## 2016-08-28	21	17	1	32	12	18	12	11	0
## 2016-08-29	24	10	1	31	2	9	16	8	13
## 2016-08-30	54	9	16	35	19	0	7	15	7
## 2016-08-31	40	2	19	54	11	17	9	9	18
## 2016-09-01	51	6	13	48	12	6	9	15	14
## 2016-09-02	41	9	17	49	3	5	5	15	2

## 2016-09-03	60	14	15	43	13	6	15	19	0
## 2016-09-04	30	5	3	25	18	8	0	10	2
## 2016-09-05	35	8	9	48	8	16	9	7	10
## 2016-09-06	45	5	4	49	4	1	19	1	8
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## 2016-09-08	43	12	1	31	6	7	15	5	6
## 2016-09-09	29	4	3	45	1	13	12	4	15
## 2016-09-10	25	14	5	22	13	3	16	13	18
## 2016-09-11	48	19	10	45	0	10	3	1	6
## 2016-09-12	53	11	2	48	7	12	16	19	8
## 2016-09-13	30	3	12	55	9	5	20	13	20
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## 2016-09-15	52	17	12	45	19	10	20	4	4
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## 2016-09-19	5	13	15	8	5	5	31	37	20
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## 2016-09-25	19	20	5	6	17	12	48	20	48
## 2016-09-26	0	19	15	6	10	18	20	25	38
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## 2016-09-28	16	14	14	20	8	8	25	36	45
## 2016-09-29	11	4	2	13	11	2	31	33	40
## 2016-09-30	18	5	8	8	15	1	54	21	21
## 2016-10-01	3	4	2	15	13	8	50	35	35
## 2016-10-02	19	11	1	11	0	17	55	54	20
## 2016-10-03	5	9	4	16	17	12	29	26	29
## 2016-10-04	15	1	7	5	8	1	25	35	46
## 2016-10-05	7	4	16	18	1	14	32	40	33
## 2016-10-06	15	19	5	8	17	17	46	48	51
## 2016-10-07	14	11	11	1	10	8	60	40	58
## 2016-10-08	11	3	4	1	1	5	29	56	37
## 2016-10-09	10	7	9	19	10	6	34	52	35
## 2016-10-10	11	8	7	15	11	11	54	50	28
## 2016-10-11	8	3	5	20	17	5	27	58	24
## 2016-10-12	1	19	13	8	7	4	57	57	34
## 2016-10-13	8	10	18	9	19	15	51	20	40
## 2016-10-14	7	7	3	5	11	1	40	39	40
## 2016-10-15	17	11	19	11	7	6	29	35	38
## 2016-10-16	16	15	4	19	3	5	55	54	40
## 2016-10-17	11	7	12	14	13	10	23	38	21
## 2016-10-18	5	7	20	0	20	1	56	38	20
## 2016-10-19	19	14	2	4	5	10	30	54	22
## 2016-10-20	0	15	3	12	2	12	43	44	33
## 2016-10-21	16	6	7	13	5	3	33	45	33

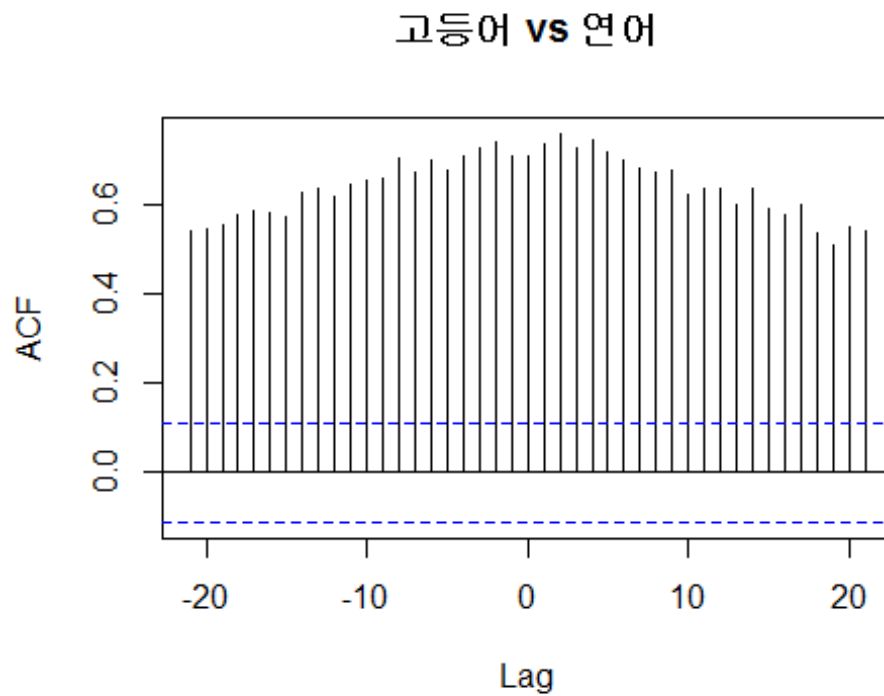
```
## 2016-10-22      19   10    1    11     2    13    40    40    31
## 2016-10-23      16   15    8    20    18     5    20    36    36
## 2016-10-24       2   15    7    11     8     4    28    46    27
## 2016-10-25       9    5    3    15    11     5    43    43    33
## 2016-10-26       7    7   10    13    11    10    51    28    47
## 2016-10-27      14   17   13     6    10    10    28    26    42
## 2016-10-28      19    8    2     6     6     1    47    36    30
## 2016-10-29      11    1    5     7    14    11    32    25    22
## 2016-10-30       0     0    9    20     6    14    22    41    46
## 2016-10-31      15    4   20     1    18     9    39    49    41
## 2016-11-01      14    8    9     4    18    14    20    58    37
## 2016-11-02      10   12   19    10    13     9    41    32    23
## 2016-11-03       1    7    2     3    19     4    43    47    52
## 2016-11-04       4   20   15     8     0    17    28    44    29
## 2016-11-05       7    6    9     2     1     1    40    36    32
## 2016-11-06      16    8    6     5    13    15    41    58    59
## 2016-11-07       7   11   18    16     6     0    29    41    20
## 2016-11-08       8   16    2     3     1     8    33    56    45
## 2016-11-09       8   12   11    20     9     0    54    22    58
## 2016-11-10      13   20   11     9     0    15    58    50    47
## 2016-11-11      13    7    3    16     2    18    47    29    26
## 2016-11-12       2   15    4     9     9    12    47    54    49
## 2016-11-13       3   19    5     2    14     3    60    20    20
## 2016-11-14      13   13   10    11    10    12    22    38    27
```

```
plot(time_keywords)
```



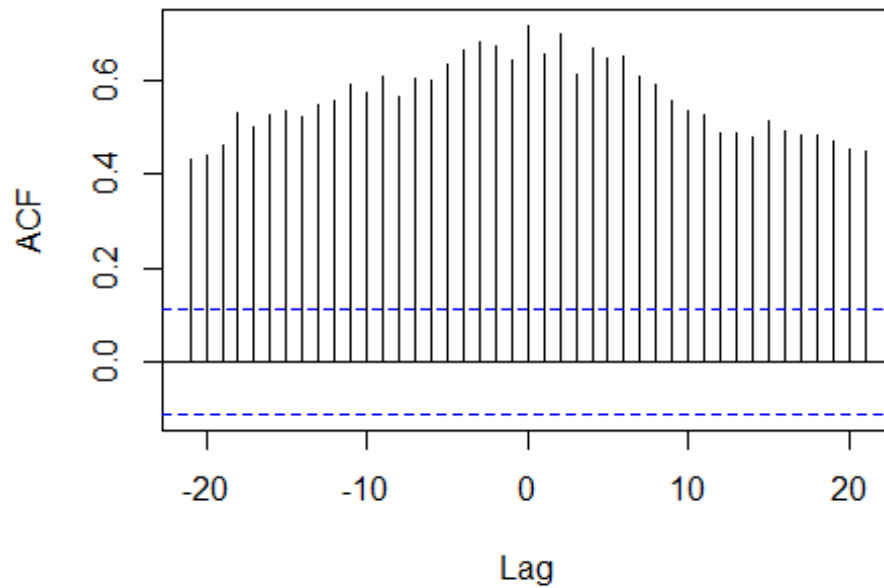
단어별로 주기적으로 어떤 패턴이 존재하는 것 같음. 각 단어 별로 arima 모델을 만들어 단어끼리 어떤 교차상관 관계가 존재하는지 검사해 볼 수 있음.

```
ccf(advice2$고등어, advice2$연어, main = "고등어 vs 연어")
```



```
ccf(advice2$장롱, advice2$탁자, main = "장롱 vs 탁자")
```

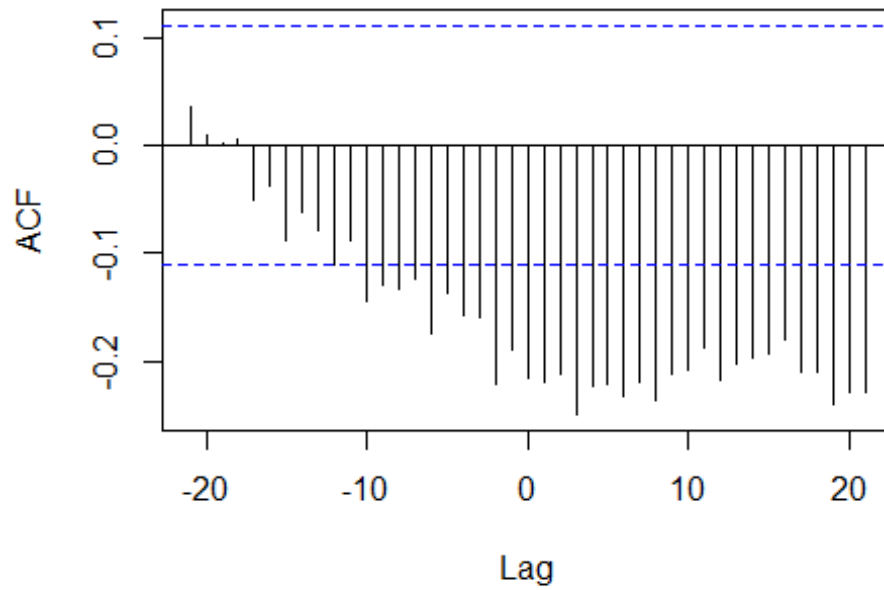
장롱 vs 탁자



전반적으로 고등어와 연어, 그리고 장롱과 탁자는 상관관계가 강한 편이며 크게 떨어지거나 올라가는 부분이 없다.

```
ccf(advice2$TV, advice2$구두, main = "TV vs 구두")
```

TV vs 구두

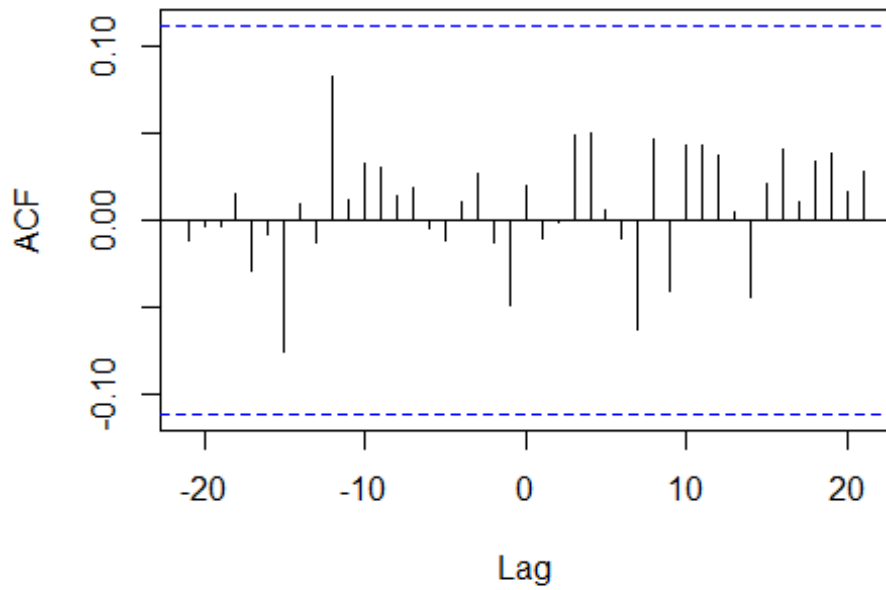


TV 와 구두는

전반적으로 음의 상관관계가 강함.

```
ccf(advice2$곰팡이, advice2$노트북, main = "곰팡이 vs 노트북")
```

곰팡이 vs 노트북



곰팡이와 노트북은 양의 상관과 음의 상관이 번갈아 나타나는 특이한 형태지만, 파란 점선 안에 있으므로 값이 워낙 작아 의미를 둘 수 없음.