

## 제10장 tm 패키지를 이용한 Corpus 실습

### 1. 텍스트 파일을 읽어서 Corpus (복수 개의 파일 묶음) 만들기

```
# 1)
library(tm)
txt <- system.file("texts", "txt", package="tm") # tm 패키지의 texts/txt 경로 : ./R/win-
library/3.5/tm/texts/txt

# 2)
ovid <- Corpus(DirSource(txt), readerControl=list(language="lat")) # 5개의 text
files (ovid_1.txt ~ ovid_5.txt)

# 3)
getReaders() # a character vector with readers provided by package tm
```

```
###
## [1] "readDataframe"      "readDOC"
## [3] "readPDF"            "readPlain"
## [5] "readRCV1"           "readRCV1asPlain"
## [7] "readReut21578XML"   "readReut21578XMLasPlain"
## [9] "readTagged"         "readXML"
```

```
# 4)로이터 통신 뉴스 데이터로 21578개의 문서
# (토픽, 저자, 위치 등에 대한 메타데이터 존재)로 구성
reut21578 <- system.file("texts", "crude", package = "tm")

# 5)
(reuters <- Corpus(DirSource(reut21578),
  readerControl = list(reader = readReut21578XML)))

(reuters <- Corpus(DirSource(reut21578),
  readerControl = list(reader = readReut21578XMLasPlain)))

#
inspect(reuters[1:3]) # 읽어들이는 3개의 문서 검토
```

결과:

```
> reut21578 <- system.file("texts", "crude", package = "tm")
>
> # 5)
> (reuters <- Corpus(DirSource(reut21578),
+   readerControl = list(reader = readReut21578XML)))
## <VCorpus>
## Metadata: corpus specific: 0, document level (indexed): 0
## Content: documents: 20
>
```

```

> (reuters <- Corpus(DirSource(reut21578),
+                      readerControl = list(reader = readReut21578XMLasPlain)))
## <<VCorpus>>
## Metadata: corpus specific: 0, document level (indexed): 0
## Content: documents: 20
>
> #
> inspect(reuters[1:3]) # 읽어들이는 3개의 문서 검토
## <<VCorpus>>
## Metadata: corpus specific: 0, document level (indexed): 0
## Content: documents: 3
##
## [[1]]
## <<PlainTextDocument>>
## Metadata: 16
## Content: chars: 527
##
## [[2]]
## <<PlainTextDocument>>
## Metadata: 16
## Content: chars: 2634
##
## [[3]]
## <<PlainTextDocument>>
## Metadata: 16
## Content: chars: 330

```

## 2. 벡터 소스(docs)로 부터 읽어 들이기 : 예..

```

# 6)
docs <- c("This is a text", "This another one.", "My name is Eric")
Corpus(VectorSource(docs))

# 7)
docsCorpus <- Corpus(VectorSource(docs))
writeCorpus(docsCorpus)

# docsCorpus의 내용 보기
inspect(docsCorpus[1:3])

docsCorpus[[1]]$content
docsCorpus[[2]]$content
docsCorpus[[3]]$content

```

결과:

```

> docs <- c("This is a text", "This another one.", "My name is Eric")
> Corpus(VectorSource(docs))
## <<SimpleCorpus>>
## Metadata: corpus specific: 1, document level (indexed): 0
## Content: documents: 3
>
> # 7)
> docsCorpus <- Corpus(VectorSource(docs))
> writeCorpus(docsCorpus)

```

```

>
> # docsCorpus의 내용 보기
> inspect(docsCorpus[1:3])
## <<SimpleCorpus>>
## Metadata: corpus specific: 1, document level (indexed): 0
## Content: documents: 3
##
## [1] This is a text      This another one. My name is Eric
>
> docsCorpus[[1]]$content
## [1] "This is a text"
> docsCorpus[[2]]$content
## [1] "This another one."
> docsCorpus[[3]]$content
## [1] "My name is Eric"

```

### 3. xml 문서를 tm\_map() 이용해서 텍스트로 전환하기

```

# 읽어들이는 문서의 directory path 정보
reut21578 <- system.file("texts", "crude", package = "tm")

# XML 리더(readReut21578XML)를 통해 문서 읽음
(reuters <- Corpus(DirSource(reut21578), readerControl = list(reader =
readReut21578XML)))

# 8) XML문서를 text(PlainTextDocument)로 전환
reuters <- tm_map(reuters, PlainTextDocument)

# ** 숫자 제거 (removeNumbers)
reuters <- tm_map(reuters, removeNumbers)

# 9) 중간 공백 (stripWhitespace) 제거
reuters <- tm_map(reuters, stripWhitespace)

# 10) 글자들을 모두 소문자로 변경(content_transformer(tolower))하여
# 사전의 내용과 비교할 수 있도록 표준화
reuters <- tm_map(reuters, content_transformer(tolower))

# 11-1) 영어의 stopwords 제거 (띄어쓰기와 시제 등의 내용 제거)
reuters <- tm_map(reuters, removeWords, stopwords("english"))

# ** 구두점 제거
reuters = tm_map(reuters, removePunctuation, preserve_intra_word_dashes = TRUE)

# 11-2) 형태소 분석 : 표준형으로 다 바꿔줌(과거형이나 복수형을 표준형으로 바꿔줌)

library(SnowballC)
tm_map(reuters, stemDocument)

```

결과 :

```
> # XML 리더(readReut21578XML)를 통해 문서 읽음
> (reuters <- Corpus(DirSource(reut21578), readerControl = list(reader =
readReut21578XML)))
<<VCorpus>>
Metadata: corpus specific: 0, document level (indexed): 0
Content: documents: 20
```

```
> # 11-2) 형태소 분석 : 표준형으로 다 바꿔줌(과거형이나 복수형을 표준형으로 바꿔줌)
> tm_map(reuters, stemDocument)
<<VCorpus>>
Metadata: corpus specific: 0, document level (indexed): 0
Content: documents: 20
>
```

## 4. 변형 및 결과 보기

```
# 12) 문서 번호와 단어 간의 사용여부 또는 빈도수를 이용하여 matrix를 만드는 작업
dtm <- DocumentTermMatrix(reuters, control=list(weighting=weightTf))
inspect(dtm[1:5,1:5])

# 13) 10회 이상의 빈출어 찾아 내기
findFreqTerms(dtm, 10)

# 14) opec와 상관계수가 0.8 이상이 단어 찾기
findAssocs(dtm, "opec", 0.6)

# 15) 희소한 단어들 제거하기
dtm2 <- removeSparseTerms(dtm, 0.2)
dtm2
```

결과:

```
> # 12) 문서 번호와 단어 간의 사용여부 또는 빈도수를 이용하여 matrix를 만드는 작업
> dtm <- DocumentTermMatrix(reuters, control=list(weighting=weightTf))
> inspect(dtm[1:5,1:5])
## <<DocumentTermMatrix (documents: 5, terms: 5)>>
## Non-/sparse entries: 1/24
## Sparsity : 96%
## Maximal term length: 10
## Weighting : term frequency (tf)
## Sample :
## Error in `[.simple_triplet_matrix`(x, docs, terms) :
## Repeated indices currently not allowed.
>
> # 13) 10회 이상의 빈출어 찾아 내기
> findFreqTerms(dtm, 10)
## [1] "barrel" "barrels" "bpd" "crude" "dlrs"
## [6] "feb" "government" "group" "industry" "kuwait"
## [11] "last" "mar" "march" "market" "meeting"
## [16] "minister" "mln" "new" "official" "oil"
## [21] "one" "opec" "output" "pct" "petroleum"
## [26] "price" "prices" "production" "reute" "reuter"
## [31] "said" "saudi" "sheikh" "will" "world"
>
> # 14) opec와 상관계수가 0.8 이상이 단어 찾기
```

```
> findAssocs(dtm, "opec", 0.6)
```

```
## $opec
```

##	analysts	buyers	meeting	oil
##	0.86	0.84	0.84	0.84
##	named	emergency	said	agreement
##	0.83	0.81	0.78	0.77
##	clearly	demand	differentials	late
##	0.76	0.76	0.76	0.76
##	reports	trying	winter	address
##	0.76	0.76	0.76	0.75
##	addressed	advantage	although	analysis
##	0.75	0.75	0.75	0.75
##	analyst	analystsby	anything	associates
##	0.75	0.75	0.75	0.75
##	bcopec-maymee	bijan	brothers	cambridge
##	0.75	0.75	0.75	0.75
##	center	cera	characterized	cheating
##	0.75	0.75	0.75	0.75
##	closer	condition	control	critical
##	0.75	0.75	0.75	0.75
##	crudeusaopey	cutting	dafflisio	daniel
##	0.75	0.75	0.75	0.75
##	david	deemed	dillard	director
##	0.75	0.75	0.75	0.75
##	earlier	easy	editor	eight
##	0.75	0.75	0.75	0.75
##	environment	excess	excesses	expects
##	0.75	0.75	0.75	0.75
##	faces	firm	harvard	however
##	0.75	0.75	0.75	0.75
##	immediately	initiative	issue	june
##	0.75	0.75	0.75	0.75
##	keep	learn	lesson	ltd
##	0.75	0.75	0.75	0.75
##	manager	mideast	mizrahi	mlotok
##	0.75	0.75	0.75	0.75
##	moussavar-rahmani	movement	need	optimism
##	0.75	0.75	0.75	0.75
##	optimistic	organization	paul	pessimistic
##	0.75	0.75	0.75	0.75
##	principal	problem	problems	production
##	0.75	0.75	0.75	0.75
##	prompted	quarter	quotas	readdress
##	0.75	0.75	0.75	0.75
##	regain	regional	reiterate	reuters
##	0.75	0.75	0.75	0.75
##	rising	salomon	scheduled	seeing
##	0.75	0.75	0.75	0.75
##	session	slackens	slide	soon
##	0.75	0.75	0.75	0.75
##	sort	spoke	spriggs	supply
##	0.75	0.75	0.75	0.75
##	teach	ted	telephone	thought
##	0.75	0.75	0.75	0.75
##	together	told	try	uncertain
##	0.75	0.75	0.75	0.75
##	universitys	unlikely	wants	wishes
##	0.75	0.75	0.75	0.75

```
##          yergin          prices          ability          markets
##          0.75          0.74          0.72          0.71
##          opecs          set          bpd          never
##          0.71          0.71          0.69          0.69
##          current        meet          must          sell
##          0.68          0.68          0.68          0.68
##          come          fixed          interview          may
##          0.67          0.67          0.67          0.67
##          next          now          december
##          0.62          0.61          0.60
##
>
> # 15) 희소한 단어들 제거하기
> dtm2 <- removeSparseTerms(dtm, 0.2)
> dtm2
## <<DocumentTermMatrix (documents: 20, terms: 4)>>
## Non-/sparse entries: 80/0
## Sparsity          : 0%
## Maximal term length: 6
## Weighting          : term frequency (tf)
```

## V. 워드 클라우드

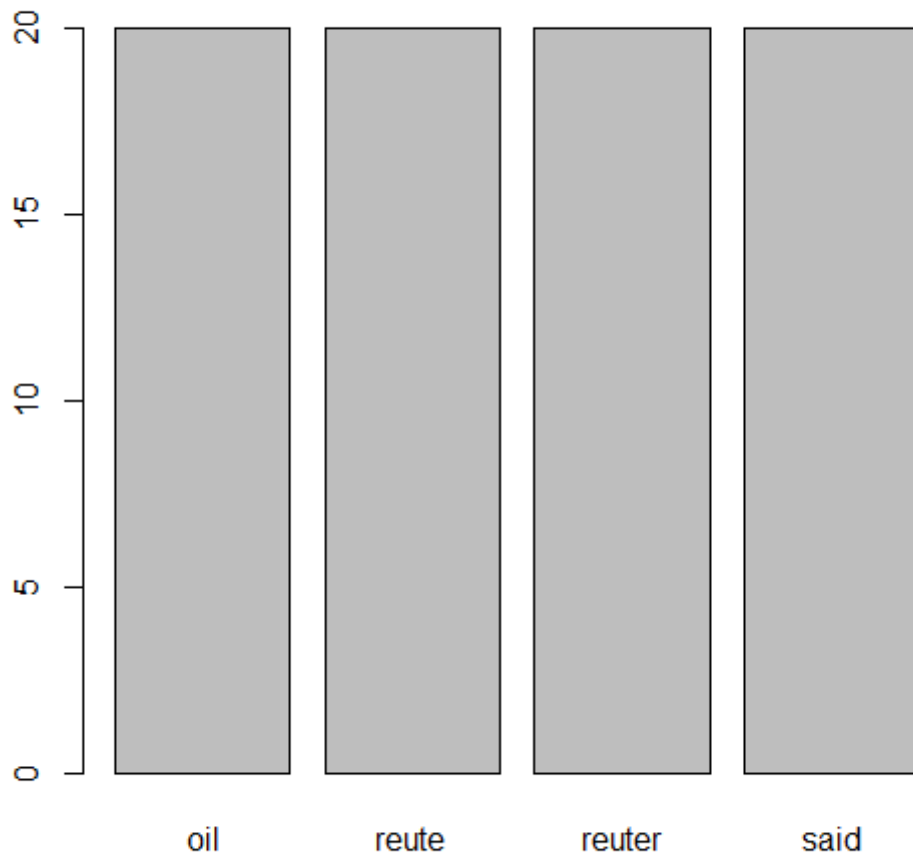
```
library(wordcloud)

# 16) 단어의 빈도를 계산하고, 빈도의 내림차순으로 정렬
freq <- colSums(as.matrix(dtm2))
freq2 <- apply(as.matrix(dtm2), 2, function(x) sum(x>0))

barplot(freq2)

# 17) 텍스트 크기나 색깔 등 효과를 주고, 워드 클라우드 만들기
wordcloud(names(freq2), freq2, colors=rainbow(20))
```

결과 1: `barplot()`



결과 2 : wordcloud()

reute  
reuter  
said  
oil

