

```
> install.packages("sentimentr")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
sentimentr_2.9.0.tgz'
Content type 'application/x-gzip' length 3983386 bytes (3.8 MB)
=====
downloaded 3.8 MB
```

```
The downloaded binary packages are in
  /var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> install.packages("syuzhet")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
syuzhet_1.0.7.tgz'
Content type 'application/x-gzip' length 3118163 bytes (3.0 MB)
=====
downloaded 3.0 MB
```

```
The downloaded binary packages are in
  /var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> install.packages("tm")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/tm_0.7-13.tgz'
Content type 'application/x-gzip' length 942715 bytes (920 KB)
=====
downloaded 920 KB
```

```
The downloaded binary packages are in
  /var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> library(sentimentr)
> library(syuzhet)
```

Attaching package: 'syuzhet'

The following object is masked from 'package:sentimentr':

```
  get_sentences
```

```
> library(tm)
Loading required package: NLP
> set.seed(1)
> listings <- read.csv(file.choose()) ## Choose Miami_listings.csv
> reviews <- read.csv(file.choose()) ## Choose or Miami_reviews.csv
> ## Run if Mac
```

```
> reviews$comments <- iconv(reviews$comments, to = "utf-8-mac")
> text <- VCorpus(VectorSource(reviews$comments))
> text <- tm_map(text, stripWhitespace)
> text <- tm_map(text, content_transformer(tolower))
> text <- tm_map(text, removeWords, stopwords("english"))
> text <- tm_map(text, stemDocument)
> sentiment <- get_sentiment(text$content, method="syuzhet")
> listings$sentiment <- sentiment
> lapply(sapply(listings,mean),round,2)
$listing_id
[1] 1000.5
```

```
$host_id
[1] 550.68
```

```
$occupancy
[1] 35.25
```

```
$price
[1] 172.51
```

```
$number_of_reviews
[1] 56.37
```

```
$rating
[1] 4.65
```

```
$accommodates
[1] 4.49
```

```
$minimum_nights
[1] 8.02
```

```
$bedrooms
[1] 1.75
```

```
$bathrooms
[1] 1.56
```

```
$beds
[1] 2.5
```

```
$host_is_superhost
[1] 0.42
```

```
$pro_host
[1] 0.74
```

```
$entire_home  
[1] 0.77
```

```
$instant_bookable  
[1] 0.29
```

```
$sentiment  
[1] 7.1
```

```
> cor_vars <- c ("occupancy", "price", "number_of_reviews", "rating", "accommodates",  
"minimum_nights",  
+ "bedrooms", "bathrooms",  
"beds", "host_is_superhost", "pro_host", "entire_home", "instant_bookable", "sentiment")  
> cor_data <- listings[cor_vars]  
> cor_table_test <- cor(cor_data)  
> round(cor_table_test, 2)
```

	occupancy	price	number_of_reviews	rating	accommodates	minimum_nights	bedrooms	bathrooms
occupancy	1.00	0.03	0.08	0.13	0.12	0.00	0.12	0.08
price	0.03	1.00	-0.07	-0.02	0.47	0.01	0.53	0.53
number_of_reviews	0.08	-0.07	1.00	0.16	-0.11	-0.12	-0.11	-0.13
rating	0.13	-0.02	0.16	1.00	0.02	-0.11	0.03	-0.01
accommodates	0.12	0.47	-0.11	0.02	1.00	-0.03	0.87	0.75
minimum_nights	0.00	0.01	-0.12	-0.11	-0.03	1.00	0.02	0.03
bedrooms	0.12	0.53	-0.11	0.03	0.87	0.02	1.00	0.82
bathrooms	0.08	0.53	-0.13	-0.01	0.75	0.03	0.82	1.00
beds	0.11	0.46	-0.10	0.02	0.85	-0.01	0.83	0.71
host_is_superhost	0.19	0.03	0.26	0.26	0.05	-0.08	0.08	0.03
pro_host	-0.01	-0.03	0.01	0.08	0.03	-0.08	-0.04	-0.03
entire_home	0.15	0.14	-0.04	-0.01	0.42	0.04	0.33	0.24
instant_bookable	0.07	0.00	0.15	0.03	0.05	-0.09	0.00	0.00
sentiment	0.12	0.01	0.26	0.23	0.06	-0.12	0.06	0.04

	beds	host_is_superhost	pro_host	entire_home	instant_bookable	sentiment
occupancy	0.11	0.19	-0.01	0.15	0.07	0.12
price	0.46	0.03	-0.03	0.14	0.00	0.01
number_of_reviews	-0.10	0.26	0.01	-0.04	0.15	0.26
rating	0.02	0.26	0.08	-0.01	0.03	0.23
accommodates	0.85	0.05	0.03	0.42	0.05	0.06
minimum_nights	-0.01	-0.08	-0.08	0.04	-0.09	-0.12
bedrooms	0.83	0.08	-0.04	0.33	0.00	0.06
bathrooms	0.71	0.03	-0.03	0.24	0.00	0.04

```

beds          1.00      0.04 -0.01   0.34      0.02   0.07
host_is_superhost 0.04          1.00   0.10   0.05      0.03   0.15
pro_host      -0.01      0.10   1.00   0.03      0.11   0.04
entire_home    0.34      0.05   0.03   1.00      0.05  -0.03
instant_bookable 0.02      0.03   0.11   0.05      1.00   0.08
sentiment      0.07      0.15   0.04  -0.03      0.08   1.00
> ## Check for multicollinearity - minus bedrooms, bathrooms, beds
> cor_vars <- c ("occupancy", "price", "rating", "accommodates", "bedrooms",
+              "host_is_superhost", "entire_home", "instant_bookable", "sentiment")
> cor_data <- listings[cor_vars]
> cor_table_final <- cor(cor_data)
> round(cor_table_final, 2)

```

```

              occupancy price rating accommodates bedrooms host_is_superhost
entire_home
occupancy          1.00 0.03 0.13      0.12 0.12      0.19 0.15
price              0.03 1.00 -0.02      0.47 0.53      0.03 0.14
rating             0.13 -0.02 1.00      0.02 0.03      0.26 -0.01
accommodates       0.12 0.47 0.02      1.00 0.87      0.05 0.42
bedrooms           0.12 0.53 0.03      0.87 1.00      0.08 0.33
host_is_superhost  0.19 0.03 0.26      0.05 0.08      1.00 0.05
entire_home        0.15 0.14 -0.01      0.42 0.33      0.05 1.00
instant_bookable   0.07 0.00 0.03      0.05 0.00      0.03 0.05
sentiment          0.12 0.01 0.23      0.06 0.06      0.15 -0.03
              instant_bookable sentiment
occupancy          0.07 0.12
price              0.00 0.01
rating             0.03 0.23
accommodates       0.05 0.06
bedrooms           0.00 0.06
host_is_superhost  0.03 0.15
entire_home        0.05 -0.03
instant_bookable   1.00 0.08
sentiment          0.08 1.00

```

```

> miami_reg_test <- lm(log(occupancy+1) ~ log(price) + log(number_of_reviews+1) +
rating +
+ log(accommodates) + log(minimum_nights+1) + host_is_superhost +
pro_host + entire_home +
+ instant_bookable + bedrooms + beds + bathrooms + sentiment, data =
listings)
> summary(miami_reg_test)

```

Call:

```

lm(formula = log(occupancy + 1) ~ log(price) + log(number_of_reviews +
1) + rating + log(accommodates) + log(minimum_nights + 1) +
host_is_superhost + pro_host + entire_home + instant_bookable +
bedrooms + beds + bathrooms + sentiment, data = listings)

```

Residuals:

Min	1Q	Median	3Q	Max
-3.7297	-0.9022	0.2172	0.9572	3.0646

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.193058	0.364162	3.276	0.00107 **
log(price)	-0.263123	0.065677	-4.006	6.39e-05 ***
log(number_of_reviews + 1)	0.074541	0.033629	2.217	0.02677 *
rating	0.214942	0.050314	4.272	2.03e-05 ***
log(accommodates)	0.293156	0.096983	3.023	0.00254 **
log(minimum_nights + 1)	0.073309	0.040189	1.824	0.06829 .
host_is_superhost	0.531780	0.067377	7.893	4.85e-15 ***
pro_host	-0.134794	0.071576	-1.883	0.05982 .
entire_home	0.686869	0.089661	7.661	2.87e-14 ***
instant_bookable	0.352024	0.069364	5.075	4.24e-07 ***
bedrooms	0.159217	0.065768	2.421	0.01557 *
beds	0.024696	0.032819	0.752	0.45184
bathrooms	-0.065334	0.063433	-1.030	0.30315
sentiment	0.028354	0.008745	3.242	0.00121 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.363 on 1986 degrees of freedom

Multiple R-squared: 0.1838, Adjusted R-squared: 0.1785

F-statistic: 34.41 on 13 and 1986 DF, p-value: < 2.2e-16

```
> miami_reg <- lm(log(occupancy+1) ~ log(price) + rating + log(accommodates) +  
host_is_superhost + entire_home +  
+ instant_bookable + bedrooms + sentiment, data = listings)  
> summary(miami_reg)
```

Call:

```
lm(formula = log(occupancy + 1) ~ log(price) + rating + log(accommodates) +  
host_is_superhost + entire_home + instant_bookable + bedrooms +  
sentiment, data = listings)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.7819	-0.8960	0.2232	0.9683	3.3546

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.488143	0.328633	4.528	6.30e-06 ***
log(price)	-0.312359	0.062879	-4.968	7.36e-07 ***
rating	0.224806	0.049216	4.568	5.23e-06 ***
log(accommodates)	0.280790	0.090228	3.112	0.001885 **

	0.556374	0.064787	8.588	< 2e-16	***
host_is_superhost	0.744827	0.086450	8.616	< 2e-16	***
entire_home	0.347646	0.067695	5.135	3.09e-07	***
instant_bookable	0.176264	0.046366	3.802	0.000148	***
bedrooms	0.035544	0.007818	4.546	5.79e-06	***
sentiment					

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.366 on 1991 degrees of freedom
Multiple R-squared: 0.1789, Adjusted R-squared: 0.1756
F-statistic: 54.21 on 8 and 1991 DF, p-value: < 2.2e-16

```
> install.packages("stm")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/stm_1.3.7.tgz'
Content type 'application/x-gzip' length 3326621 bytes (3.2 MB)
=====
downloaded 3.2 MB
```

The downloaded binary packages are in
/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> install.packages("Rtsne")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
Rtsne_0.17.tgz'
Content type 'application/x-gzip' length 557481 bytes (544 KB)
=====
downloaded 544 KB

The downloaded binary packages are in
/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> install.packages("rsvd")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
rsvd_1.0.5.tgz'
Content type 'application/x-gzip' length 3584290 bytes (3.4 MB)
=====
downloaded 3.4 MB

The downloaded binary packages are in
/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/
downloaded_packages
> install.packages("geometry")
trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
geometry_0.4.7.tgz'

Content type 'application/x-gzip' length 1437987 bytes (1.4 MB)

=====
downloaded 1.4 MB

The downloaded binary packages are in

/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/

downloaded_packages

> install.packages("SnowballC")

Error in install.packages : Updating loaded packages

> install.packages("wordcloud")

trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
wordcloud_2.6.tgz'

Content type 'application/x-gzip' length 278235 bytes (271 KB)

=====
downloaded 271 KB

The downloaded binary packages are in

/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/

downloaded_packages

> install.packages("SnowballC")

trying URL 'https://cran.rstudio.com/bin/macosx/big-sur-arm64/contrib/4.3/
SnowballC_0.7.1.tgz'

Content type 'application/x-gzip' length 657446 bytes (642 KB)

=====
downloaded 642 KB

The downloaded binary packages are in

/var/folders/3n/prwp5fv10y9cbm6klvk44cxc0000gn/T//RtmpuzKrDE/

downloaded_packages

> library(stm)

stm v1.3.7 successfully loaded. See ?stm for help.

Papers, resources, and other materials at structuraltopicmodel.com

> library(tm)

> library(Rtsne)

> library(rsvd)

> library(geometry)

> library(SnowballC)

> library(wordcloud)

Loading required package: RColorBrewer

> set.seed(1)

> reviews\$rating <- listings\$rating

> ## Run if Mac

> reviews\$comments <- iconv(reviews\$comments, to = "utf-8-mac")

> customwords = c("Airbnb", "airbnb", "Miami", "miami")

```

> processed <- textProcessor(reviews$comments, metadata = reviews,
+   customstopwords=customwords)
Building corpus...
Converting to Lower Case...
Removing punctuation...
Removing stopwords...
Remove Custom Stopwords...
Removing numbers...
Stemming...
Creating Output...
> out <- prepDocuments(processed$documents, processed$vocab, processed$meta)
Removing 3659 of 6718 terms (3659 of 106171 tokens) due to frequency
Your corpus now has 1819 documents, 3059 terms and 102512 tokens.> docs <-
out$documents
> vocab <- out$vocab
> meta <- out$meta
> reviewsFit <- stm(documents = out$documents, vocab = out$vocab, K = 0, seed = 1,
+   prevalence =~ rating, data = out$meta, init.type = "Spectral")
Beginning Spectral Initialization
    Calculating the gram matrix...
    Finding anchor words...
        Initializing tSNE with PCA...
        Using tSNE to project to a low-dimensional space...
        Calculating exact convex hull...

    Recovering initialization...
    .....
Initialization complete.
.....
Completed E-Step (1 seconds).
Completed M-Step.
Completing Iteration 1 (approx. per word bound = -5.999)
.....
Completed E-Step (1 seconds).
Completed M-Step.
Completing Iteration 2 (approx. per word bound = -5.852, relative change = 2.453e-02)
.....
Completed E-Step (1 seconds).
Completed M-Step.
Completing Iteration 3 (approx. per word bound = -5.793, relative change = 1.006e-02)
.....
Completed E-Step (1 seconds).
Completed M-Step.
Completing Iteration 4 (approx. per word bound = -5.764, relative change = 5.013e-03)
.....
Completed E-Step (1 seconds).
Completed M-Step.

```


Completing Iteration 5 (approx. per word bound = -5.747, relative change = 2.896e-03)

Topic 1: stay, host, place, definit, clean
Topic 2: clean, locat, close, cozi, great
Topic 3: beach, apart, walk, stay, exact
Topic 4: clean, esra, quiet, beach, great
Topic 5: chris, recommend, stay, high, clean
Topic 6: place, bill, hous, home, well
Topic 7: beauti, pool, home, host, love
Topic 8: great, locat, host, stay, everyth
Topic 9: stay, place, lauderdal, fort, close
Topic 10: first, time, stay, place, experi
Topic 11: definit, will, communic, pictur, take
Topic 12: cute, aaron, littl, cottag, cozi
Topic 13: enjoy, hot, spot, tub, pool
Topic 14: hous, bill, room, stay, nice
Topic 15: beauti, comfort, bed, clean, place
Topic 16: amaz, will, host, beach, view
Topic 17: locat, walk, beach, distanc, within
Topic 18: good, locat, alway, price, everyth
Topic 19: fun, great, place, pool, famili
Topic 20: everyth, space, love, thank, comfort
Topic 21: david, host, hous, sindi, best
Topic 22: littl, beach, hous, neighborhood, close
Topic 23: hous, host, walk, easi, friend
Topic 24: expect, beach, conveni, walk, distanc
Topic 25: locat, beach, restaur, close, walk
Topic 26: beach, close, comfort, hollywood, place
Topic 27: awesom, place, host, stay, recommend
Topic 28: cindi, just, perfect, aaron', exact
Topic 29: condo, excel, stay, amen, complet
Topic 30: fantast, great, view, place, stay
Topic 31: absolut, beach, amaz, beauti, view
Topic 32: clean, access, bit, easi, communic
Topic 33: feel, stay, made, famili, welcom
Topic 34: respond, quick, question, clean, help
Topic 35: good, experi, price, friend, beach
Topic 36: host, gordon, bever, room, clean
Topic 37: host, gadisai, room, nice, help
Topic 38: clean, nice, locat, friend, room
Topic 39: stay, host, accommod, great, clean
Topic 40: room, help, stay, arriv, asi
Topic 41: chris, apart, clean, everyth, need
Topic 42: locat, back, fantast, soon, come
Topic 43: place, exact, best, like, chris'
Topic 44: place, great, host, clean, close
Topic 45: everyth, host, great, place, check
Topic 46: excel, locat, beach, walk, clean

Topic 47: allow, kind, room, host, accommod
Topic 48: stay, book, host, enjoy, place
Topic 49: valu, good, locat, money, friend
Topic 50: eric, host, place, stay, pool
Topic 51: everyth, apart, perfect, need, thank
Topic 52: place, stay, great, perfect, everyth
Topic 53: place, great, stay, locat, host
Topic 54: host, excel, experi, recommend, friend
Topic 55: hous, nice, quiet, clean, pool
Topic 56: home, host, hous, away, like
Topic 57: arriv, host, wonder, even, welcom
Topic 58: store, restaur, beach, locat, close
Topic 59: amaz, recommend, properti, high, host
Topic 60: easi, check, clean, aaron, need
Topic 61: beach, great, locat, clean, need
Topic 62: nice, locat, clean, perfect, hous
Topic 63: allen, host, pool, need, perfect
Topic 64: lorrain, greg, place, wonder, apart
Topic 65: place, stay, andi, clean, area
Topic 66: hous, welcom, arriv, everyth, comfort
Topic 67: place, stay, nice, great, good
Topic 68: great, host, locat, clean, stay

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 6 (approx. per word bound = -5.736, relative change = 1.955e-03)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 7 (approx. per word bound = -5.728, relative change = 1.325e-03)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 8 (approx. per word bound = -5.723, relative change = 1.005e-03)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 9 (approx. per word bound = -5.718, relative change = 7.238e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 10 (approx. per word bound = -5.716, relative change = 4.948e-04)

Topic 1: stay, host, best, definit, recommend

Topic 2: cozi, clean, close, locat, beach

Topic 3: beach, apart, walk, exact, stay

Topic 4: esra, clean, quiet, beach, great

Topic 5: recommend, stay, clean, high, check

Topic 6: place, hous, ana, well, home
Topic 7: beauti, pool, love, host, area
Topic 8: great, locat, host, stay, hospit
Topic 9: stay, lauderdal, fort, place, close
Topic 10: first, time, stay, experi, say
Topic 11: definit, will, pictur, apart, communic
Topic 12: cute, aaron, cottag, littl, clean
Topic 13: enjoy, hot, tub, pool, spot
Topic 14: hous, bill, room, stay, backyard
Topic 15: comfort, bed, beauti, comfi, decor
Topic 16: amaz, will, view, beach, host
Topic 17: locat, walk, within, distanc, beach
Topic 18: good, locat, alway, price, apart
Topic 19: fun, great, pool, famili, friend
Topic 20: space, love, everyth, wonder, comfort
Topic 21: david, hous, sindi, host, christina
Topic 22: littl, beach, hous, neighborhood, close
Topic 23: host, hous, walk, easi, friend
Topic 24: expect, beach, conveni, walk, clean
Topic 25: locat, beach, restaur, right, walk
Topic 26: beach, close, comfort, hollywood, eileen
Topic 27: awesom, host, place, recommend, clean
Topic 28: cindi, just, perfect, clean, aaron'
Topic 29: condo, excel, stay, amen, view
Topic 30: fantast, view, stay, great, high
Topic 31: absolut, beach, andrew, amaz, view
Topic 32: access, clean, bit, easi, communic
Topic 33: feel, welcom, made, famili, stay
Topic 34: quick, respond, question, help, clean
Topic 35: good, locat, clean, beach, price
Topic 36: gordon, host, bever, friend, room
Topic 37: host, gadisai, room, nice, help
Topic 38: clean, nice, friend, room, spacious
Topic 39: host, stay, accommod, clean, definit
Topic 40: room, cynthia, help, arriv, stay
Topic 41: chris, apart, clean, need, everyth
Topic 42: back, locat, come, soon, fantast
Topic 43: place, exact, best, like, chris'
Topic 44: place, great, host, clean, close
Topic 45: everyth, host, place, check, need
Topic 46: excel, locat, beach, clean, walk
Topic 47: allow, room, kind, host, accommod
Topic 48: book, stay, enjoy, host, place
Topic 49: valu, good, locat, money, friend
Topic 50: eric, host, place, pool, stay
Topic 51: everyth, perfect, need, thank, apart
Topic 52: place, stay, perfect, great, everyth

Topic 53: place, great, stay, recommend, locat
Topic 54: host, excel, experi, recommend, friend
Topic 55: hous, nice, quiet, pool, clean
Topic 56: home, away, like, hous, felt
Topic 57: arriv, wonder, host, even, room
Topic 58: restaur, store, beach, close, groceri
Topic 59: amaz, properti, host, recommend, high
Topic 60: easi, check, clean, aaron, communic
Topic 61: beach, great, locat, clean, need
Topic 62: nice, locat, realli, perfect, hous
Topic 63: allen, host, pool, perfect, need
Topic 64: lorrain, greg, wonder, apart, spacious
Topic 65: place, stay, andi, clean, area
Topic 66: hous, arriv, welcom, elena, moment
Topic 67: place, nice, stay, price, recommend
Topic 68: host, great, clean, locat, stay

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 11 (approx. per word bound = -5.714, relative change = 3.446e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 12 (approx. per word bound = -5.712, relative change = 2.566e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 13 (approx. per word bound = -5.711, relative change = 2.780e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 14 (approx. per word bound = -5.710, relative change = 1.688e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 15 (approx. per word bound = -5.709, relative change = 1.606e-04)

Topic 1: stay, best, ever, host, definit

Topic 2: cozi, clean, close, beach, locat

Topic 3: beach, apart, walk, exact, locat

Topic 4: esra, quiet, clean, beach, room

Topic 5: recommend, check, high, clean, stay

Topic 6: place, ana, hous, well, feel

Topic 7: beauti, pool, area, love, host

Topic 8: great, locat, host, stay, hospit

Topic 9: stay, lauderdal, fort, place, close

Topic 10: first, time, stay, experi, say

Topic 11: apart, will, pictur, communic, definit

Topic 12: cute, aaron, cottag, littl, clean
Topic 13: enjoy, hot, tub, pool, spot
Topic 14: hous, bill, room, backyard, stay
Topic 15: comfort, bed, comfi, beauti, decor
Topic 16: amaz, will, beach, view, host
Topic 17: walk, locat, distanc, within, beach
Topic 18: good, locat, alway, price, apart
Topic 19: fun, pool, famili, great, extrem
Topic 20: space, love, wonder, everyth, room
Topic 21: david, hous, sindi, host, christina
Topic 22: littl, beach, neighborhood, hous, near
Topic 23: wilton, host, hous, manor, walk
Topic 24: expect, beach, walk, conveni, clean
Topic 25: locat, beach, restaur, right, close
Topic 26: beach, close, comfort, hollywood, eileen
Topic 27: awesom, host, recommend, clean, place
Topic 28: cindi, just, perfect, clean, aaron'
Topic 29: condo, stay, excel, view, amen
Topic 30: fantast, stay, view, high, great
Topic 31: absolut, beach, andrew, view, amaz
Topic 32: access, clean, bit, easi, communic
Topic 33: feel, welcom, made, famili, stay
Topic 34: quick, respond, question, help, clean
Topic 35: good, locat, clean, beach, friend
Topic 36: gordon, bever, host, friend, room
Topic 37: host, gadisai, room, nice, help
Topic 38: clean, nice, friend, room, spacious
Topic 39: host, stay, accommod, clean, definit
Topic 40: room, cynthia, help, arriv, asi
Topic 41: chris, apart, clean, need, everyth
Topic 42: back, come, locat, will, definit
Topic 43: place, exact, chris', like, deborah
Topic 44: great, place, host, clean, beach
Topic 45: everyth, host, place, need, check
Topic 46: excel, locat, beach, clean, pool
Topic 47: allow, room, kind, host, even
Topic 48: book, stay, enjoy, host, place
Topic 49: valu, money, locat, good, best
Topic 50: eric, host, place, pool, stay
Topic 51: everyth, perfect, need, thank, just
Topic 52: place, stay, perfect, everyth, great
Topic 53: place, great, stay, recommend, clean
Topic 54: host, excel, experi, recommend, friend
Topic 55: hous, nice, quiet, pool, clean
Topic 56: home, like, away, felt, hous
Topic 57: arriv, wonder, host, even, room
Topic 58: restaur, store, close, beach, walk

Topic 59: amaz, properti, host, recommend, high
Topic 60: easi, check, communic, clean, need
Topic 61: beach, great, locat, clean, need
Topic 62: nice, realli, locat, perfect, hous
Topic 63: allen, host, pool, perfect, need
Topic 64: lorrain, greg, wonder, spacious, apart
Topic 65: place, stay, andi, area, clean
Topic 66: hous, arriv, welcom, moment, elena
Topic 67: place, price, nice, recommend, stay
Topic 68: host, clean, great, locat, stay

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 16 (approx. per word bound = -5.708, relative change = 1.565e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 17 (approx. per word bound = -5.707, relative change = 1.202e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 18 (approx. per word bound = -5.707, relative change = 1.008e-04)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 19 (approx. per word bound = -5.706, relative change = 9.001e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 20 (approx. per word bound = -5.706, relative change = 7.866e-05)

Topic 1: best, stay, ever, definit, host

Topic 2: cozi, clean, close, beach, locat

Topic 3: apart, beach, exact, walk, locat

Topic 4: esra, quiet, beach, clean, room

Topic 5: recommend, check, high, dave, clean

Topic 6: place, ana, well, hous, feel

Topic 7: beauti, pool, area, privat, recommend

Topic 8: great, locat, host, hospit, stay

Topic 9: stay, lauderdal, fort, close, place

Topic 10: first, time, stay, say, experi

Topic 11: apart, view, pictur, will, communic

Topic 12: cute, aaron, cottag, littl, clean

Topic 13: enjoy, hot, tub, pool, spot

Topic 14: hous, bill, room, backyard, realli

Topic 15: comfort, bed, comfi, decor, cool

Topic 16: amaz, beach, view, will, clean

Topic 17: walk, distanc, locat, within, beach

Topic 18: good, locat, price, apart, like
Topic 19: fun, famili, pool, great, extrem
Topic 20: space, love, plenti, wonder, bathroom
Topic 21: david, hous, sindi, host, christina
Topic 22: littl, beach, near, neighborhood, hous
Topic 23: wilton, manor, host, hous, friend
Topic 24: expect, beach, walk, clean, perfect
Topic 25: locat, beach, restaur, right, las
Topic 26: beach, comfort, close, hollywood, eileen
Topic 27: awesom, host, recommend, clean, will
Topic 28: cindi, just, perfect, clean, aaron'
Topic 29: condo, stay, view, amen, ocean
Topic 30: fantast, stay, view, high, recommend
Topic 31: absolut, beach, andrew, view, hous
Topic 32: access, clean, bit, communic, accur
Topic 33: feel, welcom, made, famili, stay
Topic 34: quick, respond, question, help, clean
Topic 35: good, locat, clean, beach, friend
Topic 36: gordon, bever, host, friend, room
Topic 37: host, gadisai, room, friend, help
Topic 38: clean, nice, friend, spacious, room
Topic 39: host, stay, accommod, alway, clean
Topic 40: room, cynthia, help, arriv, asi
Topic 41: chris, apart, clean, need, cottag
Topic 42: back, come, locat, will, definit
Topic 43: exact, place, chris', like, deborah
Topic 44: great, place, host, clean, beach
Topic 45: everyth, need, host, place, check
Topic 46: excel, locat, beach, clean, pool
Topic 47: allow, room, kind, host, stay
Topic 48: book, stay, enjoy, host, although
Topic 49: valu, money, locat, best, friend
Topic 50: eric, place, host, pool, help
Topic 51: everyth, perfect, need, thank, just
Topic 52: stay, place, perfect, recommend, everyth
Topic 53: place, great, stay, recommend, high
Topic 54: experi, host, excel, recommend, friend
Topic 55: hous, larg, pool, quiet, describ
Topic 56: home, like, away, felt, hous
Topic 57: arriv, wonder, even, room, host
Topic 58: restaur, close, store, beach, walk
Topic 59: amaz, properti, host, recommend, high
Topic 60: easi, check, communic, clean, check-
Topic 61: beach, locat, great, chair, clean
Topic 62: nice, realli, hous, perfect, locat
Topic 63: allen, host, pool, perfect, need
Topic 64: lorrain, greg, wonder, spacious, apart

Topic 65: stay, place, andi, area, clean
Topic 66: hous, arriv, welcom, moment, elena
Topic 67: place, price, peopl, recommend, nice
Topic 68: host, clean, time, stay, friend

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 21 (approx. per word bound = -5.705, relative change = 7.352e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 22 (approx. per word bound = -5.705, relative change = 2.570e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 23 (approx. per word bound = -5.705, relative change = 8.724e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 24 (approx. per word bound = -5.704, relative change = 4.773e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 25 (approx. per word bound = -5.704, relative change = 3.532e-05)

Topic 1: best, stay, ever, frank, carlo
Topic 2: cozi, clean, close, recommend, beach
Topic 3: apart, beach, exact, walk, perfect
Topic 4: esra, quiet, beach, clean, room
Topic 5: recommend, high, check, dave, clean
Topic 6: place, ana, well, hous, stay
Topic 7: beauti, pool, area, privat, recommend
Topic 8: great, locat, host, hospit, stay
Topic 9: stay, lauderdal, fort, close, realli
Topic 10: first, time, say, stay, experi
Topic 11: apart, view, pictur, will, communic
Topic 12: cute, aaron, cottag, littl, clean
Topic 13: enjoy, hot, tub, pool, hous
Topic 14: hous, bill, room, backyard, friend
Topic 15: comfort, bed, comfi, cool, decor
Topic 16: amaz, beach, view, will, clean
Topic 17: walk, distanc, locat, within, beach
Topic 18: good, locat, apart, like, hotel
Topic 19: fun, famili, pool, extrem, great
Topic 20: space, love, plenti, outdoor, room
Topic 21: david, hous, sindi, host, christina
Topic 22: littl, beach, near, neighborhood, hous
Topic 23: wilton, manor, hous, host, friend

Topic 24: expect, beach, clean, walk, perfect
Topic 25: locat, beach, right, restaur, bar
Topic 26: beach, comfort, hollywood, close, eileen
Topic 27: awesom, host, recommend, clean, will
Topic 28: cindi, just, perfect, aaron', clean
Topic 29: condo, view, stay, amen, ocean
Topic 30: fantast, stay, view, high, recommend
Topic 31: absolut, beach, andrew, view, hous
Topic 32: access, clean, bit, accur, descript
Topic 33: feel, welcom, made, famili, stay
Topic 34: quick, respond, question, help, clean
Topic 35: good, locat, clean, beach, friend
Topic 36: gordon, bever, host, friend, room
Topic 37: gadisai, host, room, friend, help
Topic 38: clean, spacious, friend, room, nice
Topic 39: host, stay, accommod, alway, clean
Topic 40: room, cynthia, help, arriv, asi
Topic 41: chris, apart, clean, need, cottag
Topic 42: back, come, will, locat, definit
Topic 43: exact, place, chris', like, deborah
Topic 44: great, place, host, clean, beach
Topic 45: everyth, need, check, host, expect
Topic 46: excel, locat, beach, clean, pool
Topic 47: allow, room, kind, stay, host
Topic 48: book, stay, enjoy, host, although
Topic 49: valu, money, locat, friend, central
Topic 50: eric, pool, place, host, help
Topic 51: everyth, perfect, need, just, thank
Topic 52: stay, place, perfect, recommend, stylish
Topic 53: place, stay, great, recommend, high
Topic 54: experi, host, excel, recommend, friend
Topic 55: hous, larg, pool, quiet, bedroom
Topic 56: home, like, away, felt, feel
Topic 57: arriv, wonder, even, room, made
Topic 58: restaur, close, store, beach, groceri
Topic 59: amaz, host, properti, recommend, high
Topic 60: easi, check, communic, clean, check-
Topic 61: beach, chair, locat, clean, great
Topic 62: nice, realli, hous, perfect, quiet
Topic 63: allen, host, pool, perfect, need
Topic 64: lorrain, greg, wonder, spacious, apart
Topic 65: stay, andi, place, area, clean
Topic 66: hous, arriv, welcom, moment, elena
Topic 67: place, price, peopl, recommend, stay
Topic 68: clean, host, time, stay, friend

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 26 (approx. per word bound = -5.704, relative change = 3.903e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 27 (approx. per word bound = -5.704, relative change = 4.215e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 28 (approx. per word bound = -5.703, relative change = 5.711e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Completing Iteration 29 (approx. per word bound = -5.703, relative change = 5.433e-05)

.....
Completed E-Step (1 seconds).

Completed M-Step.

Model Converged

```
> num_topics <- reviewsFit$settings$dim$K
```

```
> num_topics
```

```
[1] 68
```

```
> out$meta$rating <- as.factor(out$meta$rating)
```

```
> prep <- estimateEffect(1:num_topics ~ rating, reviewsFit, meta=out$meta,  
+   uncertainty="Global")
```

```
> plot(prepare, covariate="rating", topics=c(1:num_topics), model=reviewsFit,  
+   method="difference", cov.value1=5, cov.value2=3,  
+   xlab="Lower Rating ... Higher Rating", main="Relationship between Topic and  
Rating",
```

```
+   labeltype="custom", custom.labels=c(1:num_topics))
```

```
> cloud(reviewsFit, topic=53)
```

```
> cloud(reviewsFit, topic=3)
```

```
> cloud(reviewsFit, topic=51)
```

```
> cloud(reviewsFit, topic=32)
```

```
> cloud(reviewsFit, topic=46)
```

```
> cloud(reviewsFit, topic=21)
```