INTRO TO TEXT MINING: BAG OF WORDS

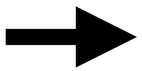
Simple word clustering

Hierarchical clustering example

```
> dist_rain <- dist(rain[, 2])
```

The data

City	Annual rainfall (in.)
Cleveland	39.14
Portland	39.14
Boston	43.77
New Orleans	62.45



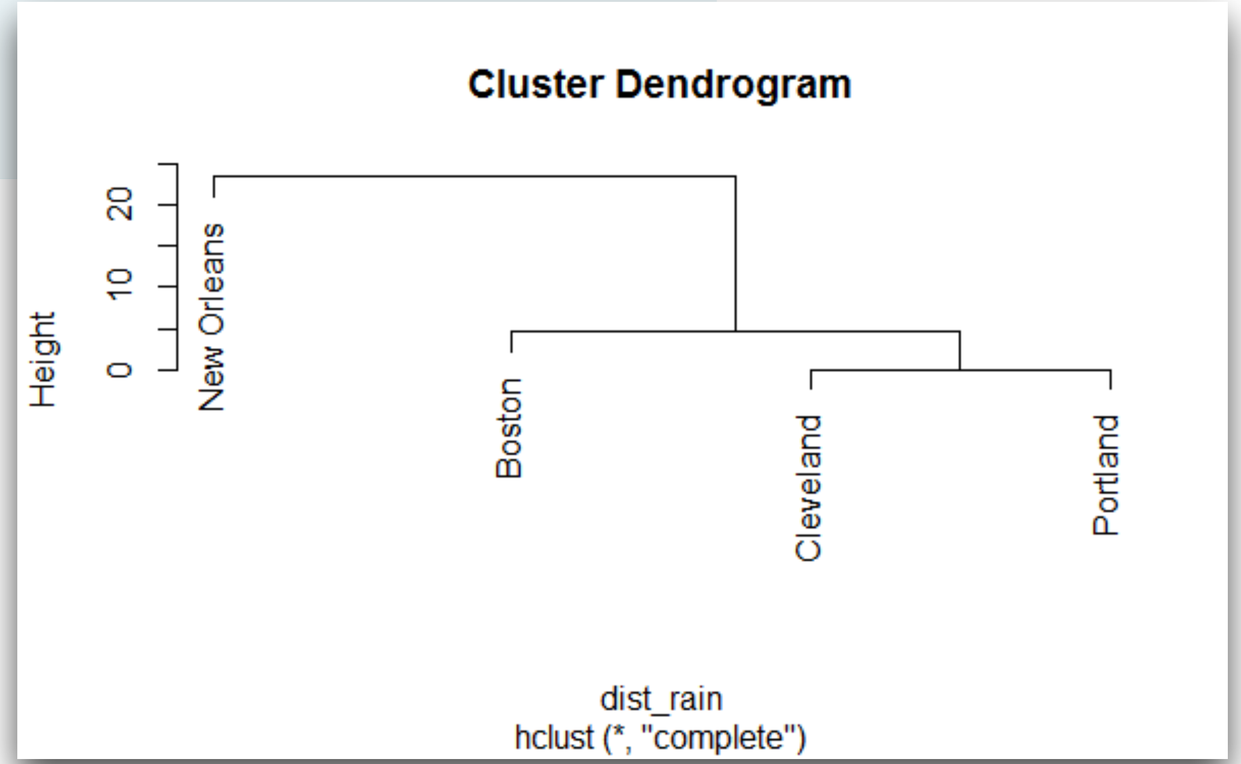
Distance matrix

	Cleveland	Portland	Boston
Portland	0.00		
Boston	4.63	4.63	
New Orleans	23.31	23.31	18.69

A simple dendrogram

```
> # Reclassify distances as hierarchical cluster object
> hc <- hclust(dist_rain)

> # Plot dendrogram with city labels
> plot(hc, labels = rain$city)
```



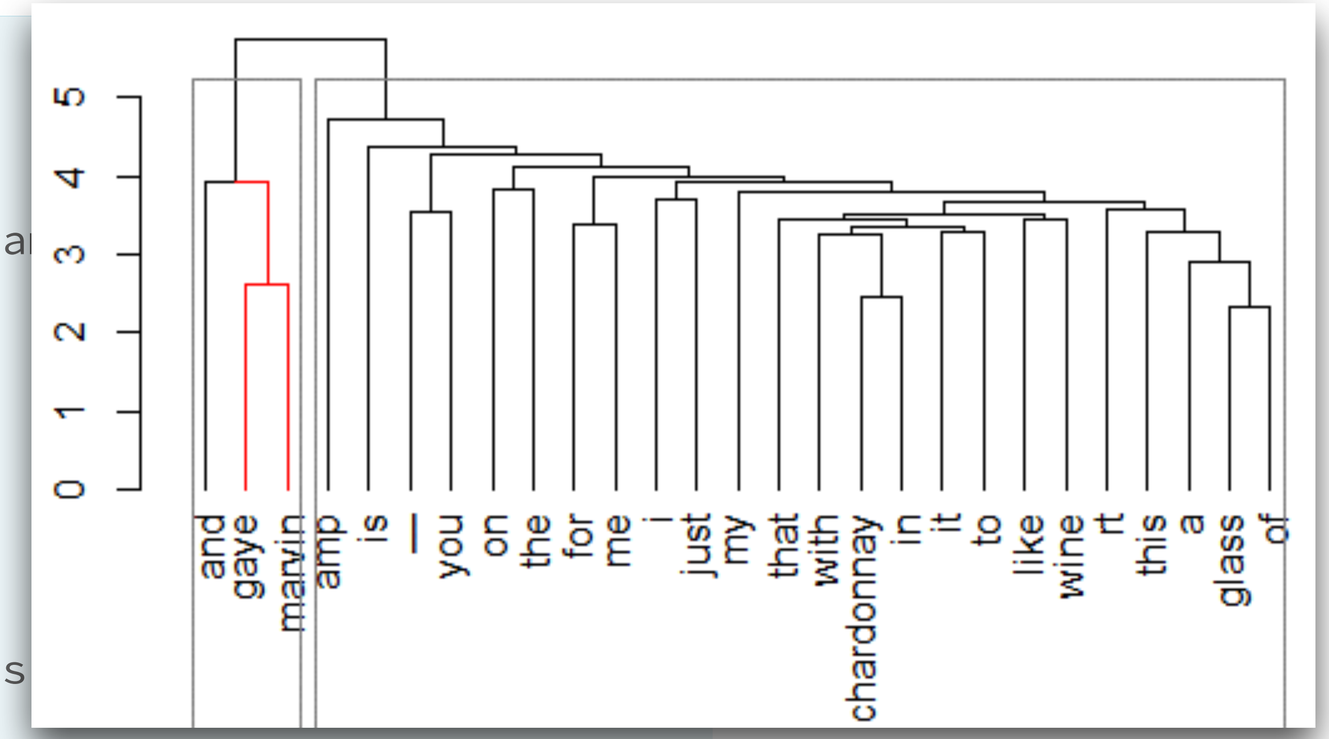
Dendrogram aesthetics

```
> # Load dendextend package
> library(dendextend)

> # Convert distance matrix to dendrogra
> hc <- hclust(tweets_dist)
> hcd <- as.dendrogram(hc)

> # Color branches
> hcd <- branches_attr_by_labels(hcd,
            c("marvin", "gaye"), "red")

> # Plot dendrogram with some aesthetics
> plot(hcd, main = "Better Dendrogram")
> rect.dendrogram(hcd, k = 2, border = "grey50")
```



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Let’s practice!

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Getting past single words

Unigrams, bigrams, trigrams, oh my!

```
> # Use only first 2 coffee tweets
> tweets$text[1:2]
[1] @ayyytylerb that is so true drink lots of coffee
[2] RT @bryzy_brib: Senior March tmw morning at 7:25 A.M. in the
SENIOR lot. Get up early, make yo coffee/breakfast, cus this will
only happen…

> # Make a unigram DTM on first 2 coffee tweets
> unigram_dtm <- DocumentTermMatrix(text_corp)
> unigram_dtm
<<DocumentTermMatrix (documents: 2, terms: 18)>>
Non-/sparse entries: 18/18
Sparsity           : 50%
Maximal term length: 15
Weighting          : term frequency (tf)
```

Unigrams, bigrams, trigrams, oh my!

```
> # Load RWeka package
> library(RWeka)

> # Define bigram tokenizer
> tokenizer <- function(x)
    NGramTokenizer(x, Weka_control(min = 2, max = 2))

> # Make a bigram TDM
> bigram_tdm <- TermDocumentMatrix(
    clean_corpus(text_corp),
    control = list(tokenize = tokenizer)
  )
> bigram_tdm
<<DocumentTermMatrix (documents: 2, terms: 21)>>
Non-/sparse entries: 21/21
Sparsity           : 50%
Maximal term length: 19
Weighting          : term frequency (tf)
```

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Let’s practice!

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Different frequency criteria

Term weights

- Default term frequency = simple word count
- Frequent words can mask insights
- Adjust term weighting via TfIdf

Term frequency-inverse document frequency

- Words appearing in many documents are penalized

Term weights

```
> # Standard term weighting
> tf_tdm <- TermDocumentMatrix(text_corp)
> tf_tdm_m <- as.matrix(tf_dtm)
> tf_tdm_m[505:510, 5:10]

> # TfIdf weighting
> tf_idf_tdm <- TermDocumentMatrix(text_corp,
                    control = list(weighting = weightTfIdf))
> tf_idf_tdm_m <- as.matrix(tf_idf_dtm)
> tf_tdm_m <- as.matrix(tf_dtm)
```

	Docs					
Terms	5	6	7	8	9	10
cocoa	0	0	0	0	0	0
cocobear	0	0	0	0	0	0
coconut	0	0	0	0	0	0
codagogy	0	0	0	0	0	0
code-alan	0	0	0	0	0	0
coffee	1	1	1	1	1	1

	Docs					
Terms	5	6	7	8	9	10
cocoa	0.00	0.000	0.000	0.000	0.000	0.000
cocobear	0.00	0.000	0.000	0.000	0.000	0.000
coconut	0.00	0.000	0.000	0.000	0.000	0.000
codagogy	0.00	0.000	0.000	0.000	0.000	0.000
code-alan	0.00	0.000	0.000	0.000	0.000	0.000
coffee	0.01	0.014	0.008	0.043	0.022	0.029

Retaining document metadata

```
> # Create mapping to metadata
> custom_reader <- readTabular(mapping = list(content = "text",
                               id = "num", author = "screenName",
                               date = "created"))

> # Create VCorpus including metadata
> test_corpus <- VCorpus(DataframeSource(tweets),
                   readerControl = list(reader = custom_reader))

> # Clean and view results
> text_corpus <- clean_corpus(text_corpus)
> text_corpus[[1]][1]
$content
[1] "ayyytylerb true drink lots coffee"
> text_corpus[[1]][2]
$meta
  id       : 1
  author   : thejennagibson
  date     : 8/9/2013 2:43
  language: en
```

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Let’s practice!