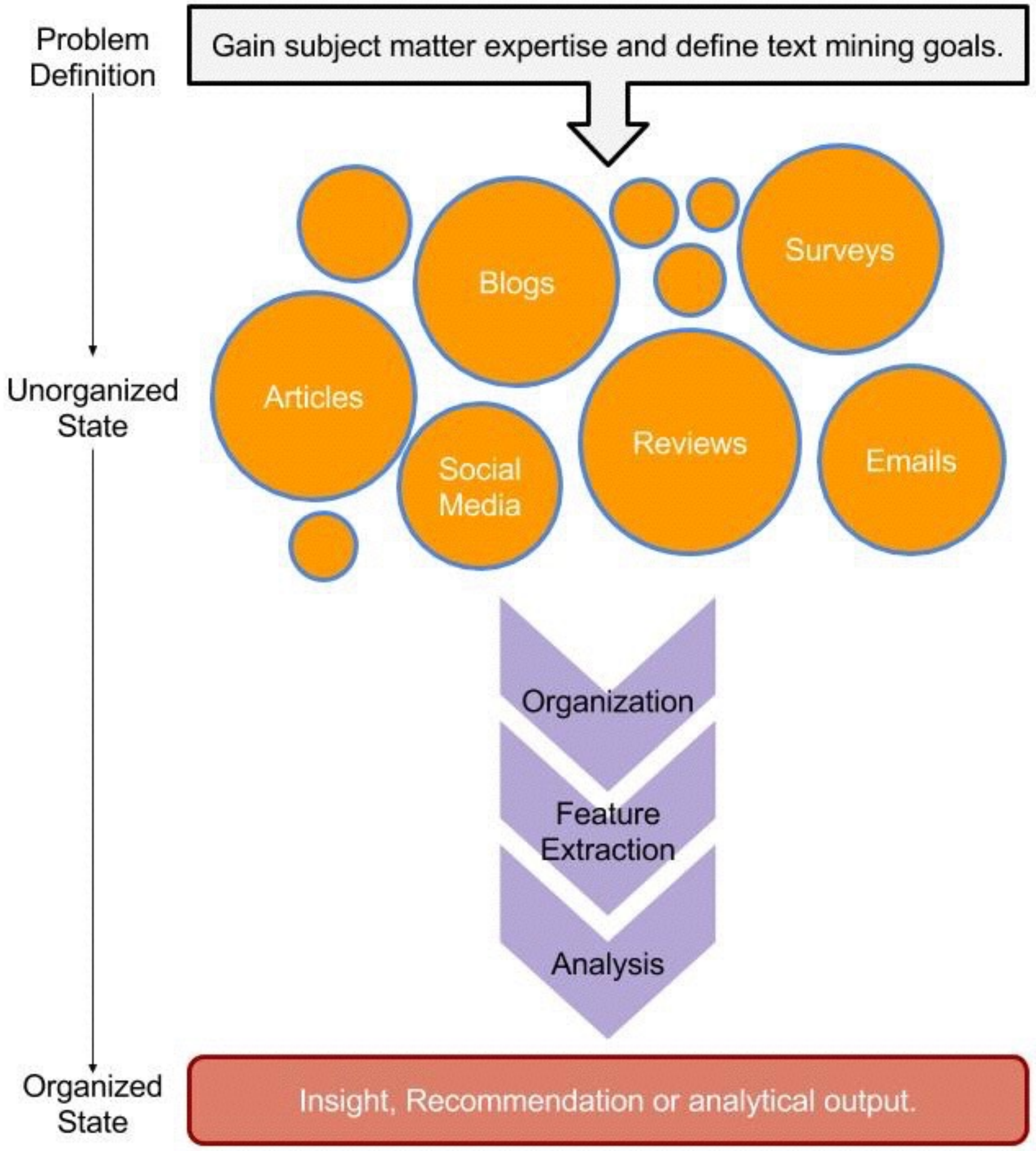
INTRO TO TEXT MINING: BAG OF WORDS

Amazon vs. Google

Remember the workflow?



1 - Problem definition & specific goals

2 - Identify text to be collected

3 - Text organization

4 - Feature extraction

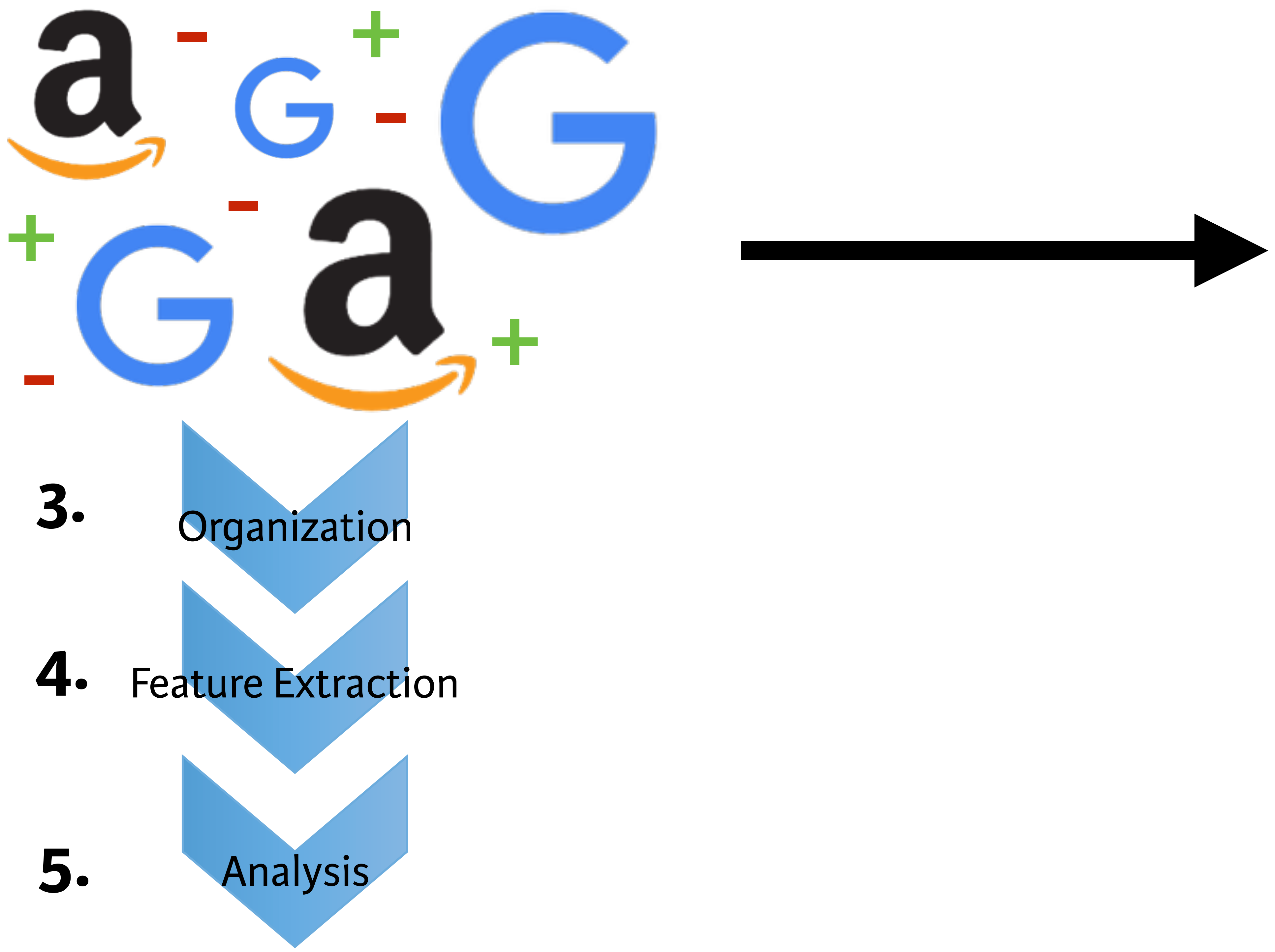
5 - Analysis

6 - Reach an insight,
recommendation or output

A case study in HR analytics

1. **Problem definition** *Which company has better work life balance? Which has better perceived pay according to online reviews?*

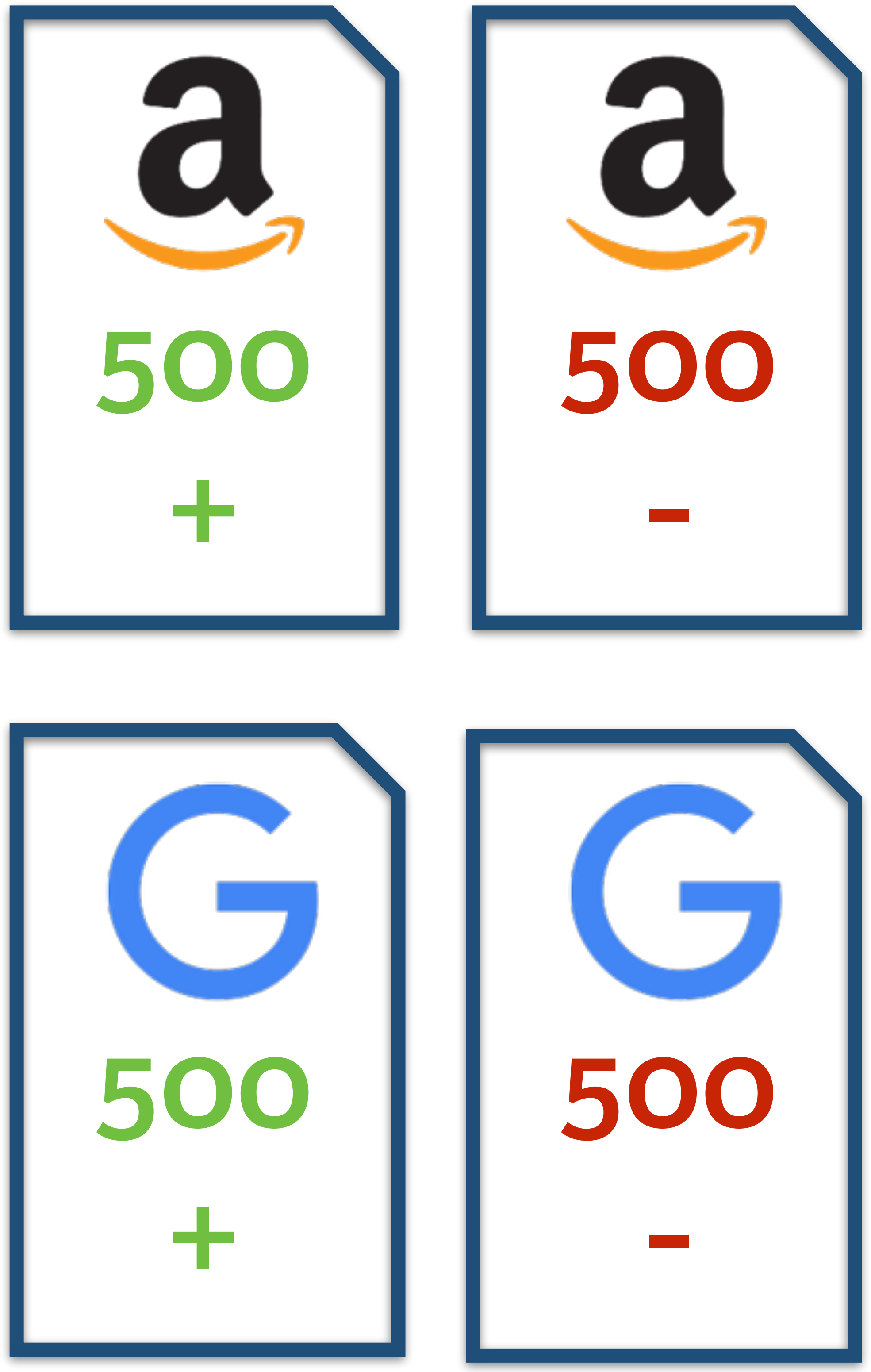
2. **Unorganized state**



3. Organization

4. Feature Extraction

5. Analysis



6. **Organized state** *Insight, recommendation, analytical output*

Let’s practice!

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Text organization

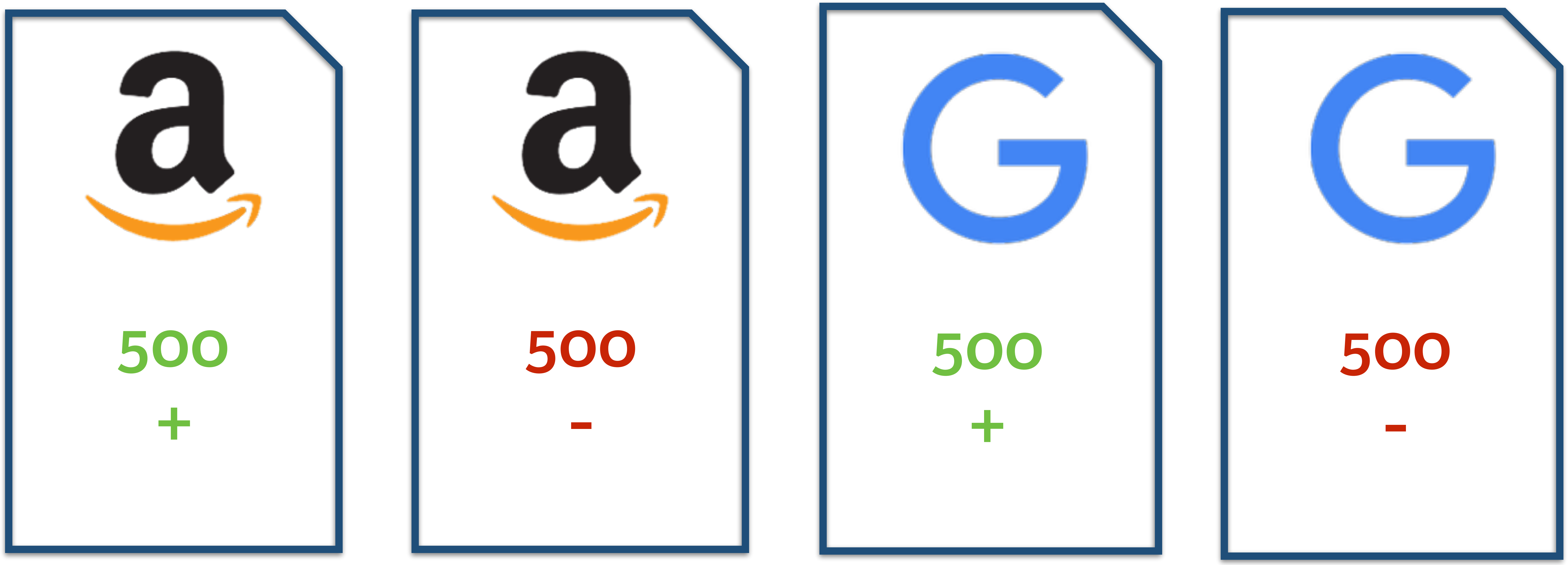
Text organization with qdap

```
# qdap cleaning function
qdap_clean <- function(x) {
  x <- replace_abbreviation(x)
  x <- replace_contraction(x)
  x <- replace_number(x)
  x <- replace_ordinal(x)
  x <- replace_symbol(x)
  x <- tolower(x)
  return(x)
}
```

Text organization with tm

```
# tm cleaning function
tm_clean <- function(corpus) {
  tm_clean <- tm_map(corpus, removePunctuation)
  corpus <- tm_map(corpus, stripWhitespace)
  corpus <- tm_map(corpus, removeWords,
                   c(stopwords("en"), "Google", "Amazon", "company"))
  return(corpus)
}
```

Cleaning your corpora



500
+

500
-

500
+

500
-

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Let’s practice!

Feature extraction and analysis

Feature extraction

```
> # Create bigram TDM
> amzn_p_tdm <- TermDocumentMatrix(
    amzn_pros_corp,
    control = list(tokenize = tokenizer)
  )
```

	Review 1	Review 2	...	Review N
Bigram 1	0	0	0	0
Bigram 2	1	1	0	0
Bigram 3	1	0	0	0
...	0	0	1	1
Bigram M	0	0	1	0

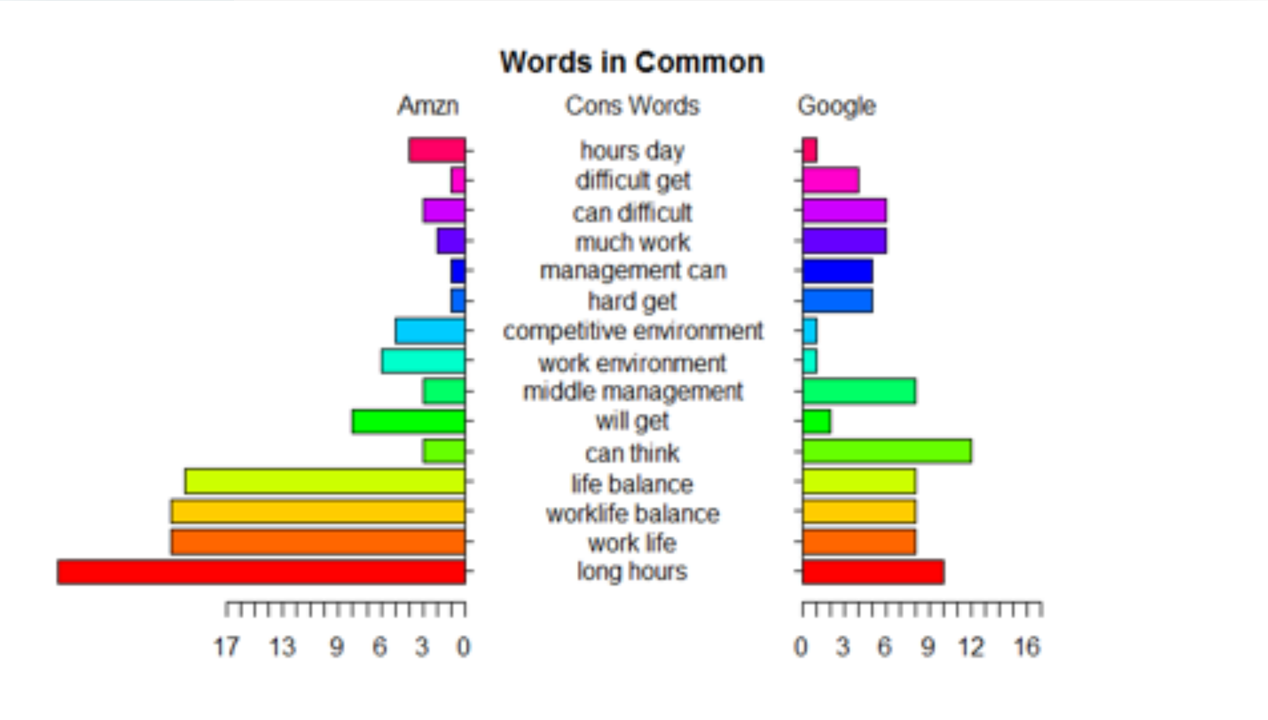
Term Document Matrix (TDM)

Get term frequencies

```
> # Convert TDM to matrix
> amzn_p_m <- as.matrix(amzn_p_tdm)

> # Compute term frequencies
> amzn_p_freq <- rowSums(amzn_p_m)

> # Sort in decreasing order of frequency
> term_frequency <- sort(amzn_p_freq, decreasing = TRUE)

> View the top 5 most frequent bigrams
> term_frequency[1:5]
      good pay great benefits   smart people
            25             24             20
    place work     fast paced
            17             16
```

Create visuals with plotrix

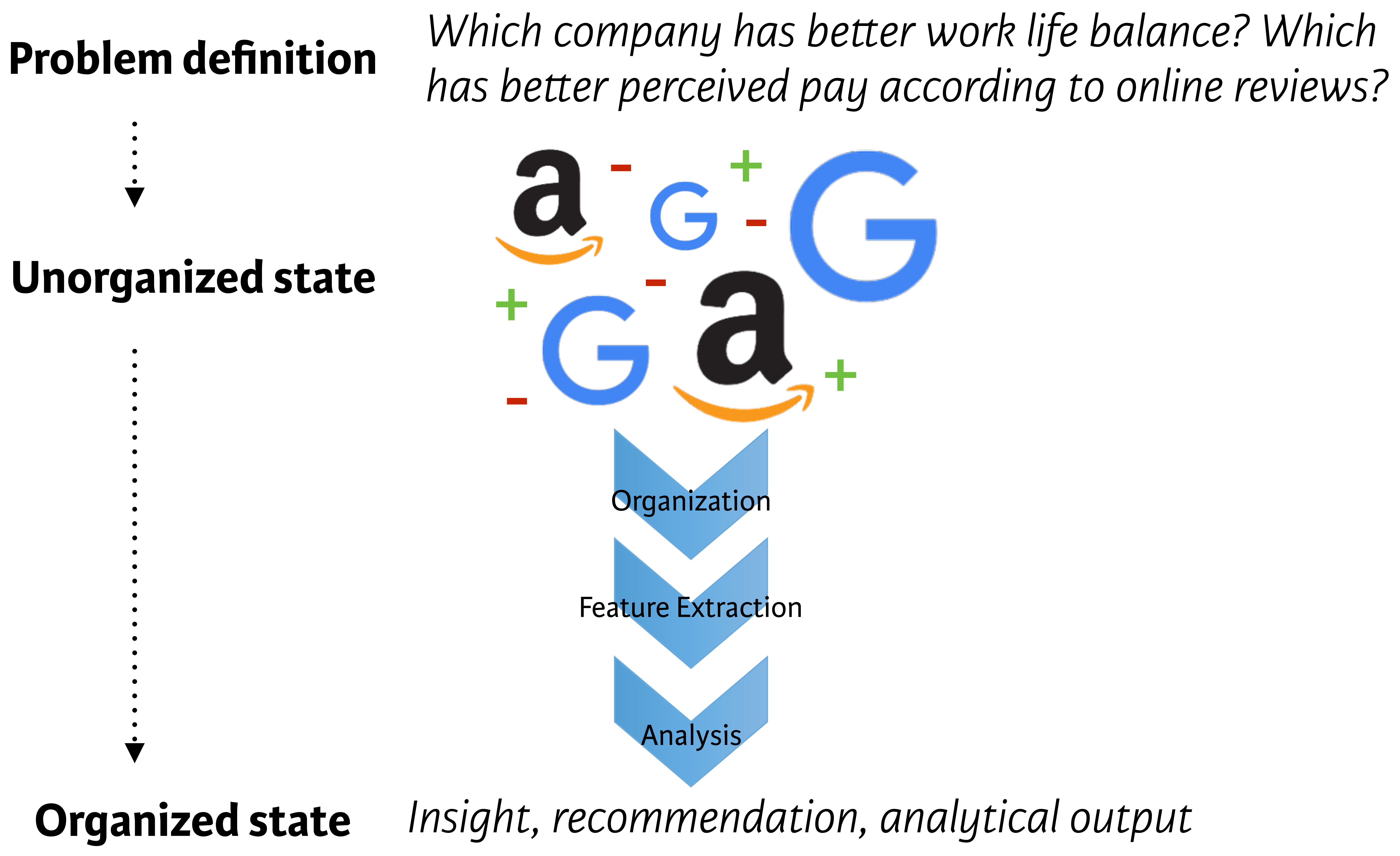
```
> # Find common words
> common_words <- subset(all_tdm_m,
                         all_tdm_m[, 1] > 0 & all_tdm_m[, 2] > 0)
> difference <- abs(common_words[, 1] - common_words[, 2])
> common_words <- cbind(common_words, difference)
> common_words <- common_words[order(common_words[, 3],
                                     decreasing = TRUE), ]

> # Create data frame: top 15 words
> top15_df <- data.frame(x = common_words[1:15, 1],
                         y = common_words[1:15, 2],
                         labels = rownames(common_words[1:15, ]))

> # Make pyramid plot
> pyramid.plot(top15_df$x, top15_df$y, labels = top15_df$labels,
               gap = 12, main = "Words in Common", unit = NULL,
               top.labels = c("Amzn", "Cons Words", "Google"))
```



Let’s practice!

Reach a conclusion

Time to reach a conclusion!


Problem definition

Which company has better work life balance? Which has better perceived pay according to online reviews?

Unorganized state

Organized state

Insight, recommendation, analytical output

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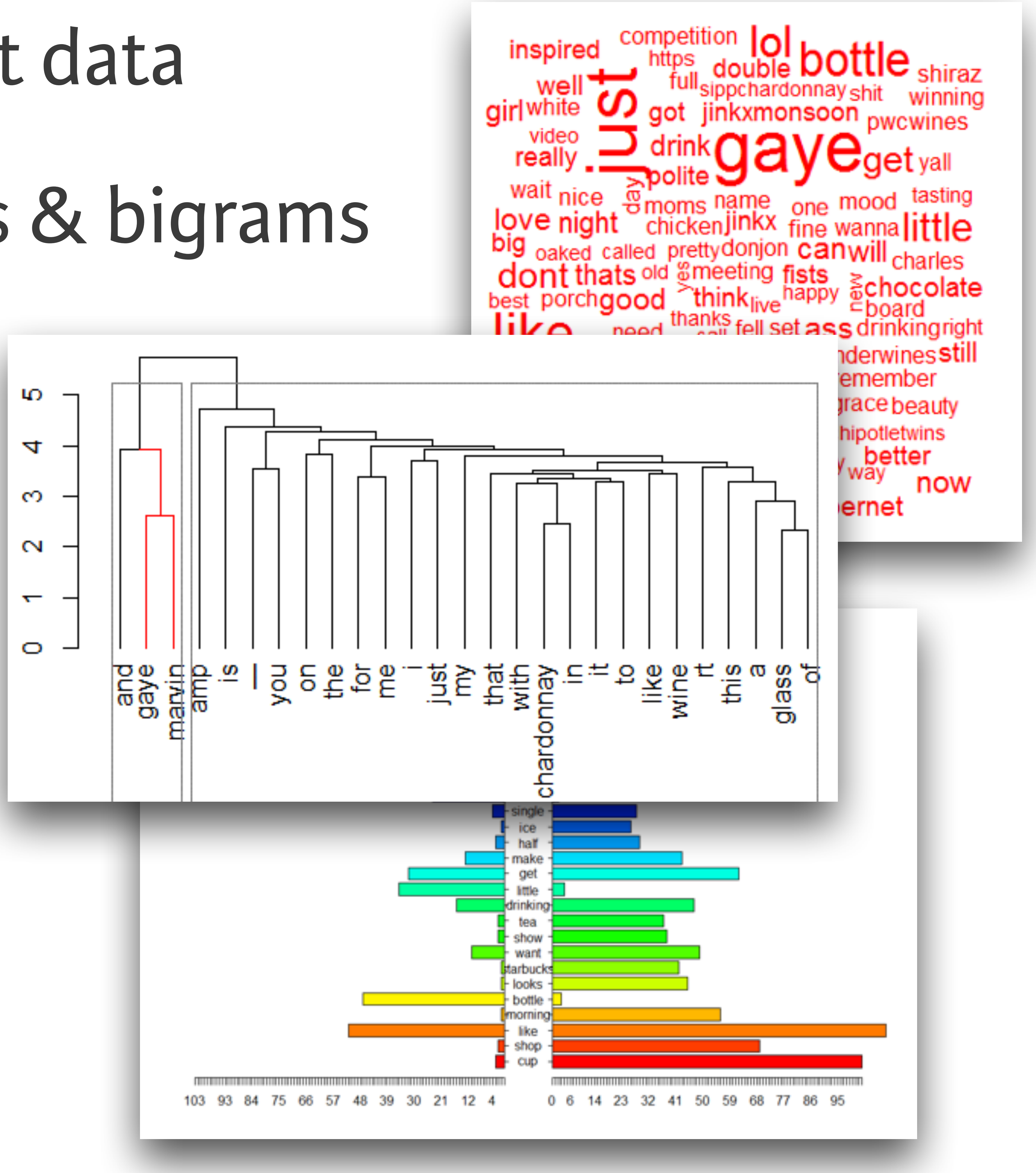
Let’s practice!

Congratulations!

In this course, you learned how to...

- Organize and clean text data
- Tokenize into unigrams & bigrams
- Build TDMs & DTMs
- Extract features
  - Top terms
  - Word associations
- Visualize text data



Get to work!