Package ‘tidytext’

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**Author** Gabriela De Queiroz [ctb],
Emil Hvitfeldt [ctb],
Os Keyes [ctb] (<https://orcid.org/0000-0001-5196-609X>),
Kanishka Misra [ctb],
Jeff Erickson [ctb],
David Robinson [aut],
Julia Silge [aut, cre] (<https://orcid.org/0000-0002-3671-836X>)

**Maintainer** Julia Silge <julia.silge@gmail.com>

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| bind_tf_idf | Bind the term frequency and inverse document frequency of a tidy text dataset to the dataset |

**Description**

Calculate and bind the term frequency and inverse document frequency of a tidy text dataset, along with the product, tf-idf, to the dataset. Each of these values are added as columns. This function supports non-standard evaluation through the tidyeval framework.

**Usage**

`bind_tf_idf(tbl, term, document, n)`

**Arguments**

- `tbl` A tidy text dataset with one-row-per-term-per-document
- `term` Column containing terms as string or symbol
- `document` Column containing document IDs as string or symbol
- `n` Column containing document-term counts as string or symbol
cast_sparse

Details
The arguments `term`, `document`, and `n` are passed by expression and support quasiquotation; you can unquote strings and symbols.
If the dataset is grouped, the groups are ignored but are retained.
The dataset must have exactly one row per document-term combination for this to work.

Examples

```r
library(dplyr)
library(janeaustenr)

book_words <- austen_books() %>%
  unnest_tokens(word, text) %>%
  count(book, word, sort = TRUE)

book_words

# find the words most distinctive to each document
book_words %>%
  bind_tf_idf(word, book, n) %>%
  arrange(desc(tf_idf))
```

---

**cast_sparse**

Create a sparse matrix from row names, column names, and values in a table.

Description
This function supports non-standard evaluation through the tidyeval framework.

Usage

```r
cast_sparse(data, row, column, value, ...)
```

Arguments

- `data` A tbl
- `row` Column name to use as row names in sparse matrix, as string or symbol
- `column` Column name to use as column names in sparse matrix, as string or symbol
- `value` Column name to use as sparse matrix values (default 1) as string or symbol
- `...` Extra arguments to pass on to `sparseMatrix`

Details
Note that cast_sparse ignores groups in a grouped tbl_df. The arguments `row`, `column`, and `value` are passed by expression and support quasiquotation; you can unquote strings and symbols.
Value

A sparse Matrix object, with one row for each unique value in the row column, one column for each unique value in the column column, and with as many non-zero values as there are rows in data.

Examples

dat <- data.frame(a = c("row1", "row1", "row2", "row2"),
                  b = c("col1", "col2", "col1", "col3", "col4"),
                  val = 1:5)

cast_sparse(dat, a, b)

cast_sparse(dat, a, b, val)

---

### cast_tdm

**Casting a data frame to a DocumentTermMatrix, TermDocumentMatrix, or dfm**

**Description**

This turns a "tidy" one-term-per-document-per-row data frame into a DocumentTermMatrix or TermDocumentMatrix from the tm package, or a dfm from the quanteda package. These functions support non-standard evaluation through the tidyeval framework. Groups are ignored.

**Usage**

- `cast_tdm(data, term, document, value, weighting = tm::weightTf, ...)`
- `cast_dtm(data, document, term, value, weighting = tm::weightTf, ...)`
- `cast_dfm(data, document, term, value, ...)`

**Arguments**

- **data**: Table with one-term-per-document-per-row
- **term**: Column containing terms as string or symbol
- **document**: Column containing document IDs as string or symbol
- **value**: Column containing values as string or symbol
- **weighting**: The weighting function for the DTM/TDM (default is term-frequency, effectively unweighted)
- **...**: Extra arguments passed on to `sparseMatrix`

**Details**

The arguments term, document, and value are passed by expression and support quasiquotation; you can unquote strings and symbols.
Description

Tidy a corpus object from the quanteda package. tidy returns a tbl_df with one-row-per-document, with a text column containing the document’s text, and one column for each document-level metadata. glance returns a one-row tbl_df with corpus-level metadata, such as source and created. For Corpus objects from the tm package, see tidy.Corpus.

Usage

```r
## S3 method for class 'corpus'
tidy(x, ...)
## S3 method for class 'corpus'
glance(x, ...)
```

Arguments

- `x` A Corpus object, such as a VCorpus or PCorpus
- `...` Extra arguments, not used

Details

For the most part, the tidy output is equivalent to the "documents" data frame in the corpus object, except that it is converted to a tbl_df, and texts column is renamed to text to be consistent with other uses in tidytext.

Similarly, the glance output is simply the "metadata" object, with NULL fields removed and turned into a one-row tbl_df.

Examples

```r
if (requireNamespace("quanteda", quietly = TRUE)) {
  data("data_corpus_inaugural", package = "quanteda")

  data_corpus_inaugural

  tidy(data_corpus_inaugural)
}
```
**dictionary_tidiers**

_Tidy dictionary objects from the quanteda package_

**Description**

Tidy dictionary objects from the quanteda package

**Usage**

```r
## S3 method for class 'dictionary2'
tidy(x, regex = FALSE, ...)
```

**Arguments**

- `x`: A dictionary object
- `regex`: Whether to turn dictionary items from a glob to a regex
- `...`: Extra arguments, not used

**Value**

A data frame with two columns: category and word.

---

**get_sentiments**

_Get a tidy data frame of a single sentiment lexicon_

**Description**

Get specific sentiment lexicons in a tidy format, with one row per word, in a form that can be joined with a one-word-per-row dataset. Each of these comes from the included `sentiments` data frame, but this performs the filtering for a specific lexicon, and removes columns that are not used in that lexicon.

**Usage**

```r
get_sentiments(lexicon = c("afinn", "bing", "nrc", "loughran"))
```

**Arguments**

- `lexicon`: The sentiment lexicon to retrieve; either "afinn", "bing", "nrc", or "loughran"

**Value**

A tbl_df with a word column, and either a sentiment column (if lexicon is not "afinn") or a numeric score column (if lexicon is "afinn").
get_stopwords

Examples

```r
library(dplyr)
get_sentiments("afinn")
get_sentiments("bing")
```

---

**get_stopwords**

Get a tidy data frame of a single stopword lexicon

**Description**

Get a specific stop word lexicon via the stopwords packages’s stopwords function, in a tidy format with one word per row.

**Usage**

```r
get_stopwords(language = "en", source = "snowball")
```

**Arguments**

- `language` The language of the stopword lexicon specified as a two-letter ISO code, such as "es", "de", or "fr". Default is "en" for English. Use `stopwords_getlanguages` from `stopwords` to see available languages.
- `source` The source of the stopword lexicon specified. Default is "snowball". Use `stopwords_getsources` from `stopwords` to see available sources.

**Value**

A tibble with two columns, word and lexicon. The parameter lexicon is "quanteda" in this case.

**Examples**

```r
library(dplyr)
get_stopwords()
get_stopwords(source = "smart")
get_stopwords("es", "snowball")
get_stopwords("ru", "snowball")
```
Tidiers for LDA and CTM objects from the topicmodels package

Description

Tidy the results of a Latent Dirichlet Allocation or Correlated Topic Model.

Usage

```r
## S3 method for class 'LDA'
tidy(x, matrix = c("beta", "gamma"), log = FALSE, ...)

## S3 method for class 'CTM'
tidy(x, matrix = c("beta", "gamma"), log = FALSE, ...)

## S3 method for class 'LDA'
augment(x, data, ...)

## S3 method for class 'CTM'
augment(x, data, ...)

## S3 method for class 'LDA'
glance(x, ...)

## S3 method for class 'CTM'
glance(x, ...)
```

Arguments

- `x`: An LDA or CTM (or LDA_VEM/CTA_VEM) object from the topicmodels package
- `matrix`: Whether to tidy the beta (per-term-per-topic, default) or gamma (per-document-per-topic) matrix
- `log`: Whether beta/gamma should be on a log scale, default FALSE
- `data`: For augment, the data given to the LDA or CTM function, either as a DocumentTermMatrix or as a tidied table with "document" and "term" columns
- `...`: Extra arguments, not used

Value

- `tidy`: returns a tidied version of either the beta or gamma matrix.
- If `matrix == "beta"` (default), returns a table with one row per topic and term, with columns
  - `topic`: Topic, as an integer
  - `term`: Term
**beta**  Probability of a term generated from a topic according to the multinomial model

If matrix == "gamma", returns a table with one row per topic and document, with columns

**topic**  Topic, as an integer

**document**  Document name or ID

**gamma**  Probability of topic given document

augment returns a table with one row per original document-term pair, such as is returned by `tdm_tidiers`:

**document**  Name of document (if present), or index

**term**  Term

**.topic**  Topic assignment

If the data argument is provided, any columns in the original data are included, combined based on the document and term columns.

glance always returns a one-row table, with columns

**iter**  Number of iterations used

**terms**  Number of terms in the model

**alpha**  If an LDA_VEM, the parameter of the Dirichlet distribution for topics over documents

### Examples

```r
if (requireNamespace("topicmodels", quietly = TRUE)) {
  set.seed(2016)
  library(dplyr)
  library(topicmodels)

  data("AssociatedPress", package = "topicmodels")
  ap <- AssociatedPress[1:100, ]
  lda <- LDA(ap, control = list(alpha = 0.1), k = 4)

  # get term distribution within each topic
  td_lda <- tidy(lda)
  td_lda

  library(ggplot2)

  # visualize the top terms within each topic
  td_lda_filtered <- td_lda %>%
    filter(beta > .004) %>%
    mutate(term = reorder(term, beta))

  ggplot(td_lda_filtered, aes(term, beta)) +
  geom_bar(stat = "identity") +
  facet_wrap(~ topic, scales = "free") +
  theme(axis.text.x = element_text(angle = 90, size = 15))
```

# get classification of each document
td lda docs <- tidy(lda, matrix = "gamma")
td lda docs

doc classes <- td lda docs %>%
  group_by(document) %>%
  top_n(1) %>%
  ungroup()
doc classes

# which were we most uncertain about?
doc classes %>%
  arrange(gamma)
}

---

mallet_tidiers *Tidiers for Latent Dirichlet Allocation models from the mallet package*

**Description**

Tidy LDA models fit by the mallet package, which wraps the Mallet topic modeling package in Java. The arguments and return values are similar to `lda_tidiers`.

**Usage**

```r
## S3 method for class 'jobRef'
tidy(x, matrix = c("beta", "gamma"), log = FALSE,
      normalized = TRUE, smoothed = TRUE, ...)

## S3 method for class 'jobRef'
augment(x, data, ...)
```

**Arguments**

- `x` A `jobRef` object, of type `RTopicModel`, such as created by `MalletLDA`.
- `matrix` Whether to tidy the beta (per-term-per-topic, default) or gamma (per-document-per-topic) matrix.
- `log` Whether beta/gamma should be on a log scale, default `FALSE`.
- `normalized` If true (default), normalize so that each document or word sums to one across the topics. If false, values will be integers representing the actual number of word-topic or document-topic assignments.
- `smoothed` If true (default), add the smoothing parameter to each to avoid any values being zero. This smoothing parameter is initialized as `alpha.sum` in `MalletLDA`.
- `...` Extra arguments, not used
- `data` For `augment`, the data given to the LDA function, either as a `DocumentTermMatrix` or as a tidied table with "document" and "term" columns.
Details

Note that the LDA models from `MalletLDA` are technically a special case of S4 objects with class `jobjRef`. These are thus implemented as `jobjRef` tidiers, with a check for whether the `toString` output is as expected.

Value

`augment` must be provided a data argument containing one row per original document-term pair, such as is returned by `tdm_tidiers`, containing columns `document` and `term`. It returns that same data with an additional column `.topic` with the topic assignment for that document-term combination.

See Also

`lda_tidiers`, `mallet.doc.topics`, `mallet.topic.words`

Examples

```r
## Not run:
library(mallet)
library(dplyr)

data("AssociatedPress", package = "topicmodels")
td <- tidy(AssociatedPress)

# mallet needs a file with stop words
tmp <- tempfile()
writelines(stop_words$word, tmp)

# two vectors: one with document IDs, one with text
docs <- td %>%
  group_by(document = as.character(document)) %>%
  summarize(text = paste(rep(term, count), collapse = " "))

docs <- mallet.import(docs$document, docs$text, tmp)

# create and run a topic model
topic_model <- MalletLDA(num.topics = 4)
topic_model$loadDocuments(docs)
topic_model$train(20)

# tidy the word-topic combinations
td_beta <- tidy(topic_model)
td_beta

# Examine the four topics
td_beta %>%
  group_by(topic) %>%
  top_n(8, beta) %>%
  ungroup() %>%
  mutate(term = reorder(term, beta)) %>%
```
parts_of_speech

```r
ggplot(aes(term, beta)) +
  geom_col() +
  facet_wrap(~ topic, scales = "free") +
  coord_flip()

# find the assignments of each word in each document
assignments <- augment(topic_model, td)
assignments

## End(Not run)
```

---

**nma_words**  
*English negators, modals, and adverbs*

**Description**  
English negators, modals, and adverbs, as a data frame. A few of these entries are two-word phrases instead of single words.

**Usage**  
nma_words

**Format**  
A data frame with 44 rows and 2 variables:

- **word**: An English word or bigram
- **modifier**: The modifier type for word, either "negator", "modal", or "adverb"

**Source**  
http://saifmohammad.com/WebPages/SCL.html#NMA

---

**parts_of_speech**  
*Parts of speech for English words from the Moby Project*

**Description**  
Parts of speech for English words from the Moby Project by Grady Ward. Words with non-ASCII characters and items with a space have been removed.

**Usage**  
parts_of_speech
**sentiments**

### Format

A data frame with 205,985 rows and 2 variables:

- **word**: An English word
- **pos**: The part of speech of the word. One of 13 options, such as "Noun", "Adverb", "Adjective"

### Details


### Source

[https://archive.org/details/mobypartofspeech03203gut](https://archive.org/details/mobypartofspeech03203gut)

### Examples

```r
library(dplyr)

parts_of_speech

parts_of_speech %>%
  count(pos, sort = TRUE)
```

---

**sentiments**  
*Sentiment lexicons from four sources*

### Description

Four lexicons for sentiment analysis are combined here in a tidy data frame. The lexicons are the NRC Emotion Lexicon from Saif Mohammad and Peter Turney, the sentiment lexicon from Bing Liu and collaborators, of Finn Arup Nielsen, and of Tim Loughran and Bill McDonald. Words with non-ASCII characters were removed from the lexicons.

### Usage

```
sentiments
```

### Format

A data frame with 27,314 rows and 4 variables:

- **word**: An English word
sentiment  A sentiment whose possible values depend on the lexicon. The "afinn" lexicon has no sentiment category (all are NA), and each of the others can be "positive" or "negative". The NRC lexicon can also be "anger", "anticipation", "disgust", "fear", "joy", "sadness", "surprise", or "trust", and the Loughran lexicon can also be "litigious", "uncertainty", "constraining", and "superfluous".

lexicon  The source of the sentiment for the word. One of either "nrc", "bing", "loughran", or "AFINN".

score  A numerical score for the sentiment. This value is NA for the Bing, NRC, and Loughran lexicons, and runs between -5 and 5 for the AFINN lexicon.

Details

Note that the Loughran lexicon is best suited for financial text, (e.g. where "share" is not necessarily positive and "liability" not necessarily negative).

Source

- http://saifmohammad.com/WebPages/lexicons.html
- https://www.cs.uic.edu/~liub/FBS/sentiment-analysis.html
- http://www2.imm.dtu.dk/pubdb/views/publication_details.php?id=6010

stm_tidiers  

Tidiers for Structural Topic Models from the stm package

Description

Tidy topic models fit by the stm package. The arguments and return values are similar to lda_tidiers.

Usage

```r
## S3 method for class 'STM'
tidy(x, matrix = c("beta", "gamma", "theta"),
     log = FALSE, document_names = NULL, ...)

## S3 method for class 'estimateEffect'
tidy(x, ...)

## S3 method for class 'STM'
augment(x, data, ...)

## S3 method for class 'STM'
glance(x, ...)
```
Arguments

- **x**: An STM fitted model object from either `stm` or `estimateEffect` from the `stm` package.
- **matrix**: Whether to tidy the beta (per-term-per-topic, default) or gamma/theta (per-document-per-topic) matrix. The `stm` package calls this the theta matrix, but other topic modeling packages call this gamma.
- **log**: Whether beta/gamma/theta should be on a log scale, default FALSE
- **document_names**: Optional vector of document names for use with per-document-per-topic tidying
- **data**: For `augment`, the data given to the `stm` function, either as a `dfm` from `quanteda` or as a tidied table with "document" and "term" columns

Value

tidy returns a tidied version of either the beta or gamma matrix if called on an object from `stm` or a tidied version of the estimated regressions if called on an object from `estimateEffect`.

`augment` must be provided a data argument, either a `dfm` from `quanteda` or a table containing one row per original document-term pair, such as is returned by `tdm_tidiers`, containing columns `document` and `term`. It returns that same data as a table with an additional column `.topic` with the topic assignment for that document-term combination.

`glance` always returns a one-row table, with columns
- **k**: Number of topics in the model
- **docs**: Number of documents in the model
- **terms**: Number of terms in the model
- **iter**: Number of iterations used
- **alpha**: If an LDA model, the parameter of the Dirichlet distribution for topics over documents

See Also

- **lda_tidiers**: If `matrix == "beta"` (default), returns a table with one row per topic and term, with columns
  - **topic**: Topic, as an integer
  - **term**: Term
- **beta**: Probability of a term generated from a topic according to the structural topic model
  If `matrix == "gamma"`, returns a table with one row per topic and document, with columns
  - **topic**: Topic, as an integer
  - **document**: Document name (if given in vector of `document_names`) or ID as an integer
  - **gamma**: Probability of topic given document
  If called on an object from `estimateEffect`, returns a table with columns
  - **topic**: Topic, as an integer
term  The term in the model being estimated and tested
estimate The estimated coefficient
std.error  The standard error from the linear model
statistic  t-statistic
p.value two-sided p-value

Examples

```r
## Not run:
if (requireNamespace("stm", quietly = TRUE)) {
  library(dplyr)
  library(ggplot2)
  library(stm)
  library(janeaustenr)
  austen_sparse <- austen_books() %>%
    unnest_tokens(word, text) %>%
    anti_join(stop_words) %>%
    count(book, word) %>%
    cast_sparse(book, word, n)
  topic_model <- stm(austen_sparse, K = 12, verbose = FALSE, init.type = "Spectral")

  # tidy the word-topic combinations
  td_beta <- tidy(topic_model)
  td_beta

  # Examine the topics
  td_beta %>%
    group_by(topic) %>%
    top_n(10, beta) %>%
    ungroup() %>%
    ggplot(aes(term, beta)) +
    geom_col() +
    facet_wrap(~ topic, scales = "free") +
    coord_flip()

  # tidy the document-topic combinations, with optional document names
  td_gamma <- tidy(topic_model, matrix = "gamma",
                  document_names = rownames(austen_sparse))
  td_gamma

  # using stm's gardarianFit, we can tidy the result of a model
  # estimated with covariates
  effects <- estimateEffect(1:3 ~ treatment, gardarianFit, gadarian)
  td_estimate <- tidy(effects)
  td_estimate
}

## End(Not run)
```
stop_words

Various lexicons for English stop words

Description

English stop words from three lexicons, as a data frame. The snowball and SMART sets are pulled from the tm package. Note that words with non-ASCII characters have been removed.

Usage

stop_words

Format

A data frame with 1149 rows and 2 variables:

word  An English word

lexicon  The source of the stop word. Either "onix", "SMART", or "snowball"

Source

• http://www.lextek.com/manuals/onix/stopwords1.html
• http://snowball.tartarus.org/algorithms/english/stop.txt

tdm_tidiers

Tidy DocumentTermMatrix, TermDocumentMatrix, and related objects from the tm package

Description

Tidy a DocumentTermMatrix or TermDocumentMatrix into a three-column data frame: term(), and value (with zeros missing), with one-row-per-term-per-document.
Usage

```r
## S3 method for class 'DocumentTermMatrix'
tidy(x, ...)

## S3 method for class 'TermDocumentMatrix'
tidy(x, ...)

## S3 method for class 'dfm'
tidy(x, ...)

## S3 method for class 'dfmSparse'
tidy(x, ...)

## S3 method for class 'simple_triplet_matrix'
tidy(x, row_names = NULL,
col_names = NULL, ...)
```

Arguments

- `x`: A `DocumentTermMatrix` or `TermDocumentMatrix` object
- `...`: Extra arguments, not used
- `row_names`: Specify row names
- `col_names`: Specify column names

Examples

```r
if (requireNamespace("topicmodels", quietly = TRUE)) {
  data("AssociatedPress", package = "topicmodels")
  AssociatedPress

  tidy(AssociatedPress)
}
```

tidy.Corpus

**Tidy a Corpus object from the tm package**

Description

Tidy a Corpus object from the tm package. Returns a data frame with one-row-per-document, with a `text` column containing the document’s text, and one column for each local (per-document) metadata tag. For corpus objects from the quanteda package, see `tidy.corpus`.

Usage

```r
## S3 method for class 'Corpus'
tidy(x, collapse = "\n", ...)
```
tidytext

Arguments

  x  A Corpus object, such as a VCorpus or PCorpus
  collapse  A string that should be used to collapse text within each corpus (if a document has multiple lines). Give NULL to not collapse strings, in which case a corpus will end up as a list column if there are multi-line documents.
  ...  Extra arguments, not used

Examples

library(dplyr)  # displaying tbl_dfs

if (requireNamespace("tm", quietly = TRUE)) {
  library(tm)
  # tm package examples
  txt <- system.file("texts", "txt", package = "tm")
  ovid <- VCorpus(DirSource(txt, encoding = "UTF-8"),
                   readerControl = list(language = "lat"))

  ovid
  tidy(ovid)

  # choose different options for collapsing text within each document
  tidy(ovid, collapse = "")$text
  tidy(ovid, collapse = NULL)$text

  # another example from Reuters articles
  reut21578 <- system.file("texts", "crude", package = "tm")
  reuters <- VCorpus(DirSource(reut21578),
                     readerControl = list(reader = readReut21578XMLasPlain))

  reuters
  tidy(reuters)
}

Description

This package implements tidy data principles to make many text mining tasks easier, more effective, and consistent with tools already in wide use.
Details

Much of the infrastructure needed for text mining with tidy data frames already exists in packages like dplyr, broom, tidyr and ggplot2.

In this package, we provide functions and supporting data sets to allow conversion of text to and from tidy formats, and to switch seamlessly between tidy tools and existing text mining packages.

To learn more about tidytext, start with the vignettes: browseVignettes(package = "tidytext")

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**tidy_triplet**

*Utility function to tidy a simple triplet matrix*

Description

Utility function to tidy a simple triplet matrix

Usage

```
tidy_triplet(x, triplets, row_names = NULL, col_names = NULL)
```

Arguments

- **x**: Object with rownames and colnames
- **triplets**: A data frame or list of i, j, x
- **row_names**: rownames, if not gotten from rownames(x)
- **col_names**: colnames, if not gotten from colnames(x)

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**unnest_tokens**

*Split a column into tokens using the tokenizers package*

Description

Split a column into tokens using the tokenizers package, splitting the table into one-token-per-row. This function supports non-standard evaluation through the tidyeval framework.

Usage

```
unnest_tokens(tbl, output, input, token = "words", format = c("text", "man", "latex", "html", "xml"), to_lower = TRUE, drop = TRUE, collapse = NULL, ...)
```
Arguments

- **tbl**: A data frame
- **output**: Output column to be created as string or symbol.
- **input**: Input column that gets split as string or symbol.
  
  The output/input arguments are passed by expression and support quasiquotation; you can unquote strings and symbols.

- **token**: Unit for tokenizing, or a custom tokenizing function. Built-in options are "words" (default), "characters", "character_shingles", "ngrams", "skip_ngrams", "sentences", "lines", "paragraphs", "regex", "tweets" (tokenization by word that preserves usernames, hashtags, and URLs), and "ptb" (Penn Treebank). If a function, should take a character vector and return a list of character vectors of the same length.

- **format**: Either "text", "man", "latex", "html", or "xml". If not text, this uses the hunspell tokenizer, and can tokenize only by "word"

- **to_lower**: Whether to turn column lowercase.

- **drop**: Whether original input column should get dropped. Ignored if the original input and new output column have the same name.

- **collapse**: Whether to combine text with newlines first in case tokens (such as sentences or paragraphs) span multiple lines. If NULL, collapses when token method is "ngrams", "skip_ngrams", "sentences", "lines", "paragraphs", or "regex".

- **...**: Extra arguments passed on to tokenizers, such as strip_punct for "words" and "tweets", n and k for "ngrams" and "skip_ngrams", strip_url for "tweets", and pattern for "regex".

Details

If the unit for tokenizing is ngrams, skip_ngrams, sentences, lines, paragraphs, or regex, the entire input will be collapsed together before tokenizing unless collapse = FALSE.

If format is anything other than "text", this uses the hunspell_parse tokenizer instead of the tokenizers package. This does not yet have support for tokenizing by any unit other than words.

Examples

```r
library(dplyr)
library(janeaustenr)

d <- data_frame(txt = prideprejudice)
d
d %>%
  unnest_tokens(word, txt)

d %>%
  unnest_tokens(sentence, txt, token = "sentences")

d %>%
```
unnest_tokens(ngram, txt, token = "ngrams", n = 2)

d %>%
  unnest_tokens(chapter, txt, token = "regex", pattern = "Chapter [\d]"")

d %>%
  unnest_tokens(shingle, txt, token = "character_shingles", n = 4)

# custom function
d %>%
  unnest_tokens(word, txt, token = stringr::str_split, pattern = " ")

# tokenize HTML
h <- data.frame(row = 1:2,
  text = c("<h1>Text <b>is</b>\", "<a href='example.com'>here</a>\")

h %>%
  unnest_tokens(word, text, format = "html")
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