Analysis of Available Data

Load the corpora

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(tidymodels)
```

```
## -- Attaching packages --------------------------------------- tidymodels 1.2.0 --
## v broom        1.0.5     v rsample      1.2.1
## v dials        1.3.0     v tune         1.2.1
## v infer        1.0.7     v workflows    1.1.4
## v modeldata    1.4.0     v workflowsets 1.1.0
## v parsnip      1.2.1     v yardstick    1.3.2
## v recipes      1.1.0
## -- Conflicts ------------------------------------------ tidymodels_conflicts() --
## x scales::discard() masks purrr::discard()
## x dplyr::filter()   masks stats::filter()
## x recipes::fixed()  masks stringr::fixed()
## x dplyr::lag()      masks stats::lag()
## x yardstick::spec() masks readr::spec()
## x recipes::step()   masks stats::step()
## * Learn how to get started at https://www.tidymodels.org/start/
```

```
library(jsonlite)
```

```
##
## Attaching package: 'jsonlite'
##
## The following object is masked from 'package:purrr':
##
##     flatten
```

```
set.seed(42)

load_kuk_subcorpus_metadata <- function(crp) {
  read_tsv(paste(c(
    "../corpora/KUK_1.0/metadata/", crp, "_DocumentFileFormat.tsv"
  ), collapse = "")) %>%
```

```
    filter(FileFormat == "TXT") %>%
    full_join(
      read_tsv(paste(c(
        "../corpora/KUK_1.0/metadata/",
        crp,
        "_DocumentIdentificationGenreProperties.tsv"
      ), collapse = "")),
      by = "KUK_ID"
    ) %>%
    mutate(across(where(is.numeric), as.character)) %>%
    mutate(subcorpus = crp) %>%
    select(KUK_ID, FileName, FileFormat, FolderPath, subcorpus, everything())
}

kuky_orig <- fromJSON("../corpora/KUKY/argumentative.json")$documents %>%
  as_tibble() %>%
  bind_rows(
    fromJSON("../corpora/KUKY/normative.json")$documents %>% as_tibble()
  ) %>%
  rename(KUK_ID = doc_id) %>%
  select(!c(plainText, doc_name)) %>%
  select(KUK_ID, everything())

kuky_kuk <- load_kuk_subcorpus_metadata("KUKY") %>%
  filter(FolderPath == "data/KUKY/TXT")
```

```
## Rows: 448 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (4): KUK_ID, FileName, FileFormat, FolderPath
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 224 Columns: 12
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (8): KUK_ID, SourceDB, Anonymized, RecipientType, RecipientIndividuation...
## lgl (4): SourceID, DocumentTitle, ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
kuky <- kuky_kuk %>% full_join(kuky_orig, by = "KUK_ID")
czcdc <- load_kuk_subcorpus_metadata("CzCDC")
```

```
## Rows: 237723 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (4): KUK_ID, FileName, FileFormat, FolderPath
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 237723 Columns: 12
## -- Column specification --------------------------------------------------------
```

```
## Delimiter: "\t"
## chr (10): KUK_ID, SourceDB, SourceID, DocumentTitle, Anonymized, RecipientTy...
## lgl  (2): ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
eso <- load_kuk_subcorpus_metadata("ESO")
```

```
## Rows: 11230 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (3): KUK_ID, FileFormat, FolderPath
## dbl (1): FileName
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 5615 Columns: 12
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (10): KUK_ID, SourceDB, SourceID, DocumentTitle, Anonymized, RecipientTy...
## lgl  (2): ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
frbo <- load_kuk_subcorpus_metadata("FrBo") %>%
  # load metadata for FrBo updated with Quality (=Readability)
  bind_rows(
    read_csv("../corpora/FrBo_contents.csv") %>%
      mutate(Readability = str_to_lower(Quality)) %>%
      mutate(across(c(Readability), ~ str_replace(.x, "good", "high"))) %>%
      select(!Quality)
  ) %>%
  # and move the Quality values to the original rows
  arrange(KUK_ID) %>%
  group_by(KUK_ID) %>%
  fill(Readability, .direction = "up") %>%
  ungroup() %>%
  filter(!is.na(FileName))
```

```
## Rows: 638 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (4): KUK_ID, FileName, FileFormat, FolderPath
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 319 Columns: 12
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (10): KUK_ID, SourceDB, SourceID, DocumentTitle, Anonymized, RecipientTy...
## lgl  (2): ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
```

```
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 310 Columns: 13
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (11): KUK_ID, SourceDB, SourceID, DocumentTitle, Quality, Anonymized, Re...
## lgl  (2): ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
lifrlaw <- load_kuk_subcorpus_metadata("LiFRLaw")
```

```
## Rows: 36 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (4): KUK_ID, FileName, FileFormat, FolderPath
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 18 Columns: 11
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (9): KUK_ID, SourceDB, SourceID, DocumentTitle, Anonymized, Recipient Ty...
## lgl (2): ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
ombuflyers <- load_kuk_subcorpus_metadata("OmbuFlyers")
```

```
## Rows: 234 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (4): KUK_ID, FileName, FileFormat, FolderPath
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Rows: 117 Columns: 12
## -- Column specification --------------------------------------------------------
## Delimiter: "\t"
## chr (8): KUK_ID, DocumentTitle, Anonymized, RecipientType, RecipientIndividu...
## lgl (4): SourceDB, SourceID, ClarityPursuit, Bindingness
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
df <- kuky %>%
  bind_rows(czcdc) %>%
  bind_rows(eso) %>%
  bind_rows(frbo) %>%
  bind_rows(lifrlaw) %>%
  bind_rows(ombuflyers)

str(df)
```

```
## tibble [244,016 x 35] (S3: tbl_df/tbl/data.frame)
```

```
##  $ KUK_ID                  : chr [1:244016] "671918e2c6537d54ff0626db" "671918e2c6537d54ff0626dc" "67
##  $ FileName                : chr [1:244016] "orig_Certifikáty autorizovaných inspektorů" "red_Co je
##  $ FileFormat              : chr [1:244016] "TXT" "TXT" "TXT" "TXT" ...
##  $ FolderPath              : chr [1:244016] "data/KUKY/TXT" "data/KUKY/TXT" "data/KUKY/TXT" "data/KU
##  $ subcorpus               : chr [1:244016] "KUKY" "KUKY" "KUKY" "KUKY" ...
##  $ SourceDB                : chr [1:244016] "SourceDB" "SourceDB" "SourceDB" "SourceDB" ...
##  $ SourceID                : chr [1:244016] NA NA NA NA ...
##  $ DocumentTitle           : chr [1:244016] NA NA NA NA ...
##  $ ClarityPursuit          : logi [1:244016] NA NA NA NA NA NA ...
##  $ Anonymized.x            : chr [1:244016] "No" "No" "No" "No" ...
##  $ RecipientType.x         : chr [1:244016] "natural person" "natural person" "natural person" "natu
##  $ RecipientIndividuation.x: chr [1:244016] "public" "public" "public" "public" ...
##  $ AuthorType.x            : chr [1:244016] "individual" "individual" "individual" "authority" ...
##  $ Objectivity.x           : chr [1:244016] "quasiobjective" "quasiobjective" "quasiobjective" "quasi
##  $ LegalActType.x          : chr [1:244016] "normative" "normative" "normative" "normative" ...
##  $ Bindingness.x           : logi [1:244016] FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ Readability             : chr [1:244016] "low" "high" "low" "low" ...
##  $ SyllogismBased          : chr [1:244016] "false" "false" "false" "false" ...
##  $ DocumentVersion         : chr [1:244016] "Original" "Redesign" "Original" "Original" ...
##  $ ParentDocumentID        : chr [1:244016] NA NA NA NA ...
##  $ LegalActType.y          : chr [1:244016] "normative" "normative" "normative" "normative" ...
##  $ Objectivity.y           : chr [1:244016] "quasiobjective" "quasiobjective" "quasiobjective" "quasi
##  $ Bindingness.y           : logi [1:244016] FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ AuthorType.y            : chr [1:244016] "individual" "individual" "individual" "authority" ...
##  $ RecipientType.y         : chr [1:244016] "natural person" "natural person" "natural person" "natu
##  $ RecipientIndividuation.y: chr [1:244016] "public" "public" "public" "public" ...
##  $ Anonymized.y            : chr [1:244016] "No" "No" "No" "No" ...
##  $ Anonymized              : chr [1:244016] NA NA NA NA ...
##  $ RecipientType           : chr [1:244016] NA NA NA NA ...
##  $ RecipientIndividuation  : chr [1:244016] NA NA NA NA ...
##  $ AuthorType              : chr [1:244016] NA NA NA NA ...
##  $ Objectivity             : chr [1:244016] NA NA NA NA ...
##  $ LegalActType            : chr [1:244016] NA NA NA NA ...
##  $ Bindingness             : logi [1:244016] NA NA NA NA NA NA ...
##  $ Recipient Type          : chr [1:244016] NA NA NA NA ...
```

Properties of KUKY

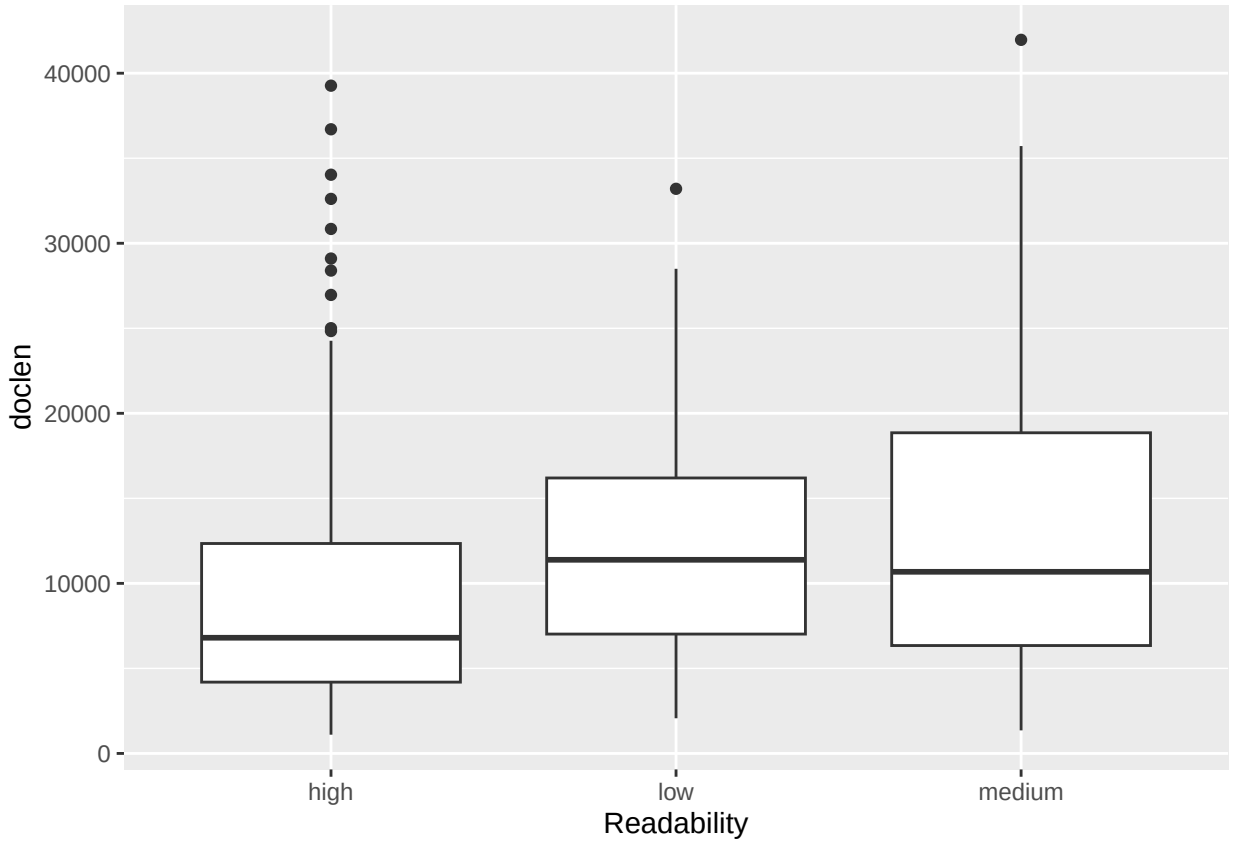
```
kuky_properties_df <- fromJSON(
  "../corpora/KUKY/argumentative.json"
)$documents %>%
  as_tibble() %>%
  bind_rows(
    fromJSON("../corpora/KUKY/normative.json")$documents %>% as_tibble()
  ) %>%
  rename(KUK_ID = doc_id) %>%
  mutate(doclen = str_length(plainText))

table(kuky_properties_df$Readability)
```

```
##
##   high    low medium
##    125     38     61
```

```
table(kuky_properties_df$Readability, kuky_properties_df$SyllogismBased)
```

```
##
##          false true
##   high      62   62
##   low       38    0
##   medium    48   11
```

```
kuky_properties_df %>% ggplot(aes(x = Readability, y = doclen)) +
  geom_boxplot()
```



Quick peek into other parts of the data set:

Subcorpus	Low # of chars	High # of chars
CzCDC/ConCo	2.000	18.000
CzCDC/SupAdmCo	3.000	30.000
CzCDC/SupCo	3.000	10.000
ESO	7.000	40.000
FrBo/articles	4.000	15.000

Filter out duplicates

Some subcorpora overlap (*FrBo* with *ESO*, and multiple subcorpora with *KUKY*).

The usage of documents with ClarityPursuit == NA is questionable, let's exclude such documents. This effectively comes with a price of excluding the whole *ESO* subcorpus, even though some of its documents are available in *KUKY*.

The usage of documents with ClarityPursuit == TRUE is also questionable as they're not reviewed in the same manner as the documents from KUKY, yet at the same time they are less likely to be as "unreadable" as the documents with ClarityPursuit == FALSE. Such documents could very well be readable, interfering with the training process.

After filtering ClarityPursuit == NA out, the only remaining overlaps are with *KUKY*. Let's keep the documents from *KUKY* as they are associated with a more careful readability evaluation.

Additionaly, there are 3 cases where a text is assessed for readability both by *KUKY* and by *FrBo*. In 2 of these cases, the assessments don't agree: the texts are assessed "low" in *KUKY*, but "medium" by *FrBo*. This doesn't matter **under the condition** that we put them both in the same class for the training (i.e., "bad"). Let's keep the observations from *KUKY* for simplicity.

```
table(df$subcorpus, df$ClarityPursuit, useNA = "ifany")
```

```
##
##                FALSE   TRUE   <NA>
##   CzCDC       237723      0      0
##   ESO              0      0   5615
##   FrBo           114    205      0
##   KUKY             0      0    224
##   LiFRLaw          6     12      0
##   OmbuFlyers      52     65      0
```

```
table(df$ClarityPursuit, df$Readability, df$subcorpus, useNA = "ifany")
```

```
## , ,  = CzCDC
##
##
##           high    low medium   <NA>
##   FALSE      0      0      0 237723
##   TRUE       0      0      0      0
##   <NA>       0      0      0      0
##
## , ,  = ESO
##
##
##           high    low medium   <NA>
##   FALSE      0      0      0      0
##   TRUE       0      0      0      0
##   <NA>       0      0      0   5615
##
## , ,  = FrBo
##
##
##           high    low medium   <NA>
##   FALSE     51      0     54      9
##   TRUE     188      0     17      0
##   <NA>       0      0      0      0
##
## , ,  = KUKY
##
##
##           high    low medium   <NA>
##   FALSE      0      0      0      0
##   TRUE       0      0      0      0
```

```
##   <NA>     125     38     61      0
##
## , ,  = LiFRLaw
##
##
##           high    low medium   <NA>
##   FALSE      0      0      0      6
##   TRUE       0      0      0     12
##   <NA>       0      0      0      0
##
## , ,  = OmbuFlyers
##
##
##           high    low medium   <NA>
##   FALSE      0      0      0     52
##   TRUE       0      0      0     65
##   <NA>       0      0      0      0
```

```
# display duplicate file entries
df %>%
  group_by(FileName) %>%
  mutate(n = n()) %>%
  filter(n > 1) %>%
  select(FileName, subcorpus, Readability, ClarityPursuit) %>%
  arrange(FileName) %>%
  print(n = 80)
```

```
## # A tibble: 80 x 4
## # Groups:   FileName [40]
##    FileName                                subcorpus Readability ClarityPursuit
##    <chr>                                   <chr>     <chr>       <lgl>
##  1 100                                     ESO       <NA>        NA
##  2 100                                     FrBo      high        TRUE
##  3 102                                     ESO       <NA>        NA
##  4 102                                     FrBo      high        TRUE
##  5 110                                     ESO       <NA>        NA
##  6 110                                     FrBo      medium      TRUE
##  7 14                                      ESO       <NA>        NA
##  8 14                                      FrBo      high        TRUE
##  9 142                                     ESO       <NA>        NA
## 10 142                                     FrBo      medium      TRUE
## 11 148                                     ESO       <NA>        NA
## 12 148                                     FrBo      high        TRUE
## 13 152                                     ESO       <NA>        NA
## 14 152                                     FrBo      high        TRUE
## 15 154                                     ESO       <NA>        NA
## 16 154                                     FrBo      medium      TRUE
## 17 156                                     ESO       <NA>        NA
## 18 156                                     FrBo      high        TRUE
## 19 158                                     ESO       <NA>        NA
## 20 158                                     FrBo      high        TRUE
## 21 16                                      ESO       <NA>        NA
## 22 16                                      FrBo      high        TRUE
## 23 170                                     ESO       <NA>        NA
## 24 170                                     FrBo      medium      TRUE
```

```
## 25 176                                        ESO       <NA>       NA
## 26 176                                        FrBo      medium     TRUE
## 27 18                                         ESO       <NA>       NA
## 28 18                                         FrBo      high       TRUE
## 29 190                                        ESO       <NA>       NA
## 30 190                                        FrBo      high       TRUE
## 31 200                                        ESO       <NA>       NA
## 32 200                                        FrBo      high       TRUE
## 33 202                                        ESO       <NA>       NA
## 34 202                                        FrBo      high       TRUE
## 35 204                                        ESO       <NA>       NA
## 36 204                                        FrBo      high       TRUE
## 37 206                                        ESO       <NA>       NA
## 38 206                                        FrBo      high       TRUE
## 39 208                                        ESO       <NA>       NA
## 40 208                                        FrBo      high       TRUE
## 41 24                                         ESO       <NA>       NA
## 42 24                                         FrBo      high       TRUE
## 43 28                                         ESO       <NA>       NA
## 44 28                                         FrBo      medium     TRUE
## 45 30                                         ESO       <NA>       NA
## 46 30                                         FrBo      high       TRUE
## 47 42                                         ESO       <NA>       NA
## 48 42                                         FrBo      medium     TRUE
## 49 44                                         ESO       <NA>       NA
## 50 44                                         FrBo      high       TRUE
## 51 54                                         ESO       <NA>       NA
## 52 54                                         FrBo      high       TRUE
## 53 68                                         ESO       <NA>       NA
## 54 68                                         FrBo      medium     TRUE
## 55 70                                         ESO       <NA>       NA
## 56 70                                         FrBo      high       TRUE
## 57 76                                         ESO       <NA>       NA
## 58 76                                         FrBo      high       TRUE
## 59 Duchody                                    KUKY      low        NA
## 60 Duchody                                    OmbuFlye~ <NA>       FALSE
## 61 Odpadni-vody                               KUKY      low        NA
## 62 Odpadni-vody                               OmbuFlye~ <NA>       FALSE
## 63 ockovani-1_kusv                            KUKY      high       NA
## 64 ockovani-1_kusv                            LiFRLaw   <NA>       TRUE
## 65 ockovani-3_orig                            KUKY      low        NA
## 66 ockovani-3_orig                            LiFRLaw   <NA>       FALSE
## 67 orig_Certifikáty autorizovaných inspekt~ KUKY      low        NA
## 68 orig_Certifikáty autorizovaných inspekt~ FrBo      medium     FALSE
## 69 orig_financovani_politickych_stran         KUKY      low        NA
## 70 orig_financovani_politickych_stran         FrBo      medium     FALSE
## 71 red_Co je to územní plánování_final_při~ KUKY      high       NA
## 72 red_Co je to územní plánování_final_při~ FrBo      high       TRUE
## 73 stavarska-1_kusv                           KUKY      high       NA
## 74 stavarska-1_kusv                           LiFRLaw   <NA>       TRUE
## 75 stavarska-2_orig                           KUKY      low        NA
## 76 stavarska-2_orig                           LiFRLaw   <NA>       FALSE
## 77 zaloba-1_orig                              KUKY      medium     NA
## 78 zaloba-1_orig                              LiFRLaw   <NA>       FALSE
```

```
## 79 zaloba-2_kusv                              KUKY      high        NA
## 80 zaloba-2_kusv                              LiFRLaw   <NA>        TRUE
```

```
# search for FrBo duplicates
df_frbo_duplicates <- df %>%
  filter(str_detect(FileName, "red_|orig_")) %>%
  mutate(new_fname = str_remove(FileName, "^[0-9]{3}_")) %>%
  group_by(new_fname) %>%
  mutate(n = n()) %>%
  ungroup() %>%
  filter(n >= 2)

all_duplicates <- df_frbo_duplicates %>% pull(FileName)

df_frbo_dup_wide <- df_frbo_duplicates %>%
  select(new_fname, subcorpus, Readability, n) %>%
  distinct(new_fname, subcorpus, Readability, n) %>%
  pivot_wider(
    names_from = subcorpus,
    values_from = Readability,
    names_prefix = "Readability_"
  )

table(df_frbo_dup_wide$Readability_KUKY, df_frbo_dup_wide$Readability_FrBo)
```

```
##
##          high medium
##   high     15      0
##   low       7      5
##   medium    1      0
```

```
# this is valid UNDER THE CONDITION that we construct the "good" class
# out of high-readability texts only
good_duplicates <- df_frbo_dup_wide %>%
  filter(
    Readability_KUKY == Readability_FrBo | (
      (Readability_KUKY == "medium" | Readability_KUKY == "low") &
        (Readability_FrBo == "medium")
    )
  ) %>%
  pull(new_fname)

bad_duplicates <- setdiff(all_duplicates, good_duplicates)

# remove FrBo/articles-originated texts from KUKY because:
#   1. they are duplicates
#   2. they are actually represented in markdown
df %>%
  filter(subcorpus == "KUKY" & str_detect(FileName, "red_|orig_")) %>%
  pull(FileName)
```

```
##  [1] "orig_Certifikáty autorizovaných inspektorů"
##  [2] "red_Co je to územní plánování_final_přidat odkaz na manuál o RP až bude"
##  [3] "orig_financovani_politickych_stran"
##  [4] "003_red_Jak dosáhnout změny dopravního značení_final"
##  [5] "015_orig_Jak komunikovat s úřady elektronicky"
```

```
##  [6] "021_red_Jak daleko od hranice pozemku musí být umístěno elektrické vedení"
##  [7] "013_orig_10 významných práv účastníka správního řízení"
##  [8] "020_red_Jak chránit vody a správně s nimi nakládat_revKZ"
##  [9] "030_orig_Co je to a jak probíhá integrované povolování_final"
## [10] "018_red_Co je to úřední deska a jak ji využít"
## [11] "012_orig_Jak chránit vody a správně s nimi nakládat_revKZ"
## [12] "010_red_Guerilla gardening, jak zahradničit na veřejném prostranství (ne)legálně_final"
## [13] "014_red_Co je to a jak probíhá integrované povolování_final"
## [14] "031_orig_Co je to EIA_final"
## [15] "023_red_Co dělat, když soused postavil černou stvabu_final, bacha na infrgafiku"
## [16] "029_orig_Certifikáty autorizovaných inspektorů"
## [17] "032_orig_Co je to úřední deska a jak ji využít"
## [18] "026_orig_Jak jedná spolek navenek"
## [19] "041_red_Hlukové limity a udělování výjimek_prefinal"
## [20] "027_orig_Jak dosáhnout odpovědnosti úředníka za škodu"
## [21] "038_orig_Co je to korupce a klientelismus"
## [22] "025_red_GDPR Jak právo chrání osobní údaje_final"
## [23] "028_orig_Co dělat, když soused postavil černou stvabu_final, bacha na infrgafiku"
## [24] "034_red_Jak dosáhnout zrušení stanoviska EIA_final"
## [25] "036_red_Dotčený vlastník - Kdo to je a jaká má v územním plánování práva_final"
## [26] "059_red_10 významných práv účastníka správního řízení"
## [27] "044_red_financovani_politickych_stran úprava 2021"
## [28] "053_orig_Guerilla gardening, jak zahradničit na veřejném prostranství (ne)legálně_final"
## [29] "051_orig_Co je to regulační plán a jak dosáhnout jeho přijetí_původní"
## [30] "049_red_CO je černá stvaba a jak ji ponat"
```

```r
df <- df %>%
  filter(subcorpus != "KUKY" | !str_detect(FileName, "red_|orig_"))

# remove FrBo articles with different readability assessments by KUKY and FrBo
df <- df %>% filter(!(FileName %in% bad_duplicates))

# keep only rows where either Readability or ClarityPursuit isn't NA
# and exclude ClarityPursuit == TRUE
df <- df %>%
  filter(!is.na(Readability) | ClarityPursuit == FALSE)

# 8 duplicates remaining
# keep the ones from KUKY as they have a readability assessment (see above)
df <- df %>%
  group_by(FileName) %>%
  mutate(n = n()) %>%
  ungroup() %>%
  filter(n == 1 | subcorpus == "KUKY") %>%
  select(!n)
```

The dataset is now free of overlaps.

Prepare for ML

Classes

```r
table(df$subcorpus, df$Readability, useNA = "ifany")
```

```
##
##                high    low medium   <NA>
##   CzCDC           0      0      0 237723
##   FrBo          231      0     71      8
##   KUKY          110     24     60      0
##   LiFRLaw         0      0      0      3
##   OmbuFlyers      0      0      0     50
```

```
df <- df %>%
  mutate(class = if_else(Readability %in% c("high"), "good", "bad"))
```

Data set parameters

```
.split_prop <- 4 / 5 # proportion of testing data in the dataset
.no_folds <- 10 # no. of folds in v-fold cross-validation
.balance <- 1 / 3 # proportion of positive samples in the target dataset

dssize_positive <- count(df %>% filter(class == "good"))[[1, 1]]
dssize_total <- dssize_positive / .balance
dssize_negative <- dssize_total - dssize_positive

cat(c(
  paste(c(
    "Data set size: ", dssize_total, "\n"
  ), collapse = ""),
  paste(c(
    "Positive class size: ", dssize_positive, "\n"
  ), collapse = ""),
  paste(c(
    "Negative class size: ", dssize_negative, "\n"
  ), collapse = ""),
  paste(c(
    "Training data set size: ", dssize_total * .split_prop, "\n"
  ), collapse = ""),
  paste(c(
    "Training positive class size: ", dssize_positive * .split_prop, "\n"
  ), collapse = ""),
  paste(c(
    "Training negative class size: ", dssize_negative * .split_prop, "\n"
  ), collapse = ""),
  paste(c(
    "One fold size: ", (dssize_total * .split_prop) / .no_folds, "\n"
  ), collapse = ""),
  paste(c(
    "One fold positive class size: ", (dssize_positive * .split_prop) / .no_folds, "\n"
  ), collapse = ""),
  paste(c(
    "One fold negative class size: ", (dssize_negative * .split_prop) / .no_folds, "\n"
  ), collapse = ""),
  paste(c(
    "Evaluation data set size: ", dssize_total * (1 - .split_prop), "\n"
  ), collapse = ""),
  paste(c(
    "Evaluation positive class size: ", dssize_positive * (1 - .split_prop), "\n"
```

```
  ), collapse = ""),
  paste(c(
    "Evaluation negative class size: ", dssize_negative * (1 - .split_prop), "\n"
  ), collapse = "")
))
```

```
## Data set size: 1023
##  Positive class size: 341
##  Negative class size: 682
##  Training data set size: 818.4
##  Training positive class size: 272.8
##  Training negative class size: 545.6
##  One fold size: 81.84
##  One fold positive class size: 27.28
##  One fold negative class size: 54.56
##  Evaluation data set size: 204.6
##  Evaluation positive class size: 68.2
##  Evaluation negative class size: 136.4
```

Data set undersampling and split

```
table(df$subcorpus, df$class)
```

```
##
##                 bad   good
##   CzCDC      237723      0
##   FrBo           79    231
##   KUKY           84    110
##   LiFRLaw         3      0
##   OmbuFlyers     50      0
```

```
table(df$ClarityPursuit, df$class, useNA = "ifany")
```

```
##
##            bad   good
##   FALSE 237838     44
##   TRUE      17    187
##   <NA>      84    110
```

```
bads <- df %>%
  filter(class == "bad") %>%
  group_by(subcorpus) %>%
  mutate(subcorpus_size = n()) %>%
  ungroup()

max_negative_subcorpus <- bads %>%
  arrange(-subcorpus_size) %>%
  head(n = 1)

mns_name <- max_negative_subcorpus %>% pull(subcorpus)
mns_size <- max_negative_subcorpus %>% pull(subcorpus_size)
orig_negative_class_size <- bads %>%
  count() %>%
  pull(n)
```

```r
# target undersample of MNS = target neg. size - other-negative-subcorpora-size
mns_target_size <- dssize_negative - (orig_negative_class_size - mns_size)

mns_sample <- sample(
  bads %>% filter(subcorpus == mns_name) %>% pull(KUK_ID), mns_target_size
)

df <- df %>% filter(
  class == "good" |
    subcorpus != mns_name |
    KUK_ID %in% mns_sample
)

table(df$subcorpus, df$class)
```

```
##
##              bad good
##   CzCDC      466    0
##   FrBo        79  231
##   KUKY        84  110
##   LiFRLaw      3    0
##   OmbuFlyers  50    0
```

```r
write_csv(
  df %>%
    select(
      KUK_ID,
      class,
      FileName,
      FolderPath,
      subcorpus,
      DocumentTitle,
      Readability,
      ClarityPursuit,
      SyllogismBased,
      SourceDB
    ),
  "selected_documents.csv"
)

# the split and folds aren't needed at the moment
# they'll be required in the training phase

df_split <- df %>% initial_split(prop = .split_prop)
training_set <- training(df_split)
evaluation_set <- testing(df_split)

folds <- vfold_cv(training_set, v = .no_folds, strata = class)

print(df_split)
```

```
## <Training/Testing/Total>
## <818/205/1023>
```

```r
print(folds)
```

```
## #  10-fold cross-validation using stratification
## # A tibble: 10 x 2
##    splits           id
##    <list>           <chr>
##  1 <split [736/82]> Fold01
##  2 <split [736/82]> Fold02
##  3 <split [736/82]> Fold03
##  4 <split [736/82]> Fold04
##  5 <split [736/82]> Fold05
##  6 <split [736/82]> Fold06
##  7 <split [736/82]> Fold07
##  8 <split [736/82]> Fold08
##  9 <split [736/82]> Fold09
## 10 <split [738/80]> Fold10
```