Tial’s Mini Project 1

“The Metamorphosis” from Kaggle :

```
Metamorphosis <-
  read.table("/Users/a209112/Downloads/datasets/metamorphosis_clean.txt", header = FALSE, sep

rename (text = "V1")
```

Tokenize :

```
metamorph_tidy <- as_tibble(Metamorphosis) |>
  mutate(line = row_number()) |>
  unnest_tokens(word, text, token = "words")

metamorph_tidy
```

```
# A tibble: 22,048 x 2
    line word
   <int> <chr>
 1     1 i
 2     2 one
 3     2 morning
 4     2 when
 5     2 gregor
 6     2 samsa
 7     2 woke
 8     2 from
 9     2 troubled
10     2 dreams
# i 22,038 more rows
```

```r
Metamorphosis |> slice_tail(n = 10)
```

```
                                                                      text
1    better location and, most of all, more practical. All the time, Grete
2   was becoming livelier. With all the worry they had been having of late
3   her cheeks had become pale, but, while they were talking, Mr. and Mrs.
4  Samsa were struck, almost simultaneously, with the thought of how their
5      daughter was blossoming into a well built and beautiful young lady.
6    They became quieter. Just from each other’s glance and almost without
7     knowing it they agreed that it would soon be time to find a good man
8         for her. And, as if in confirmation of their new dreams and good
9      intentions, as soon as they reached their destination Grete was the
10                         first to get up and stretch out her young body.
```

```r
metamorph_tidy |> slice_tail(n = 20)
```

```
# A tibble: 20 x 2
    line word
   <int> <chr>
 1  1754 as
 2  1754 soon
 3  1754 as
 4  1754 they
 5  1754 reached
 6  1754 their
 7  1754 destination
 8  1754 grete
 9  1754 was
10  1754 the
11  1755 first
12  1755 to
13  1755 get
14  1755 up
15  1755 and
16  1755 stretch
17  1755 out
18  1755 her
19  1755 young
20  1755 body
```

Different str_ functions :

1.Finding words that start with “mon-”

```
str_view(metamorph_tidy$word,"^mon")
```

```
  [668] │ <mon>ey
 [3560] │ <mon>ey
 [8529] │ <mon>th
 [9615] │ <mon>ey
 [9706] │ <mon>ey
[10007] │ <mon>ey
[10042] │ <mon>ey
[10050] │ <mon>th
[10087] │ <mon>ey
[10127] │ <mon>ey
[10161] │ <mon>ey
[10173] │ <mon>ey
[10241] │ <mon>ey
[10283] │ <mon>ey
[10336] │ <mon>ey
[10814] │ <mon>th
[12147] │ <mon>otonous
[12156] │ <mon>ths
[14058] │ <mon>ogram
[14661] │ <mon>th
... and 2 more
```

2. Counting how many constants are in each word

```
metamorph_tidy |>
  select(word) |>
  mutate(n_vowels = str_count(word, "[^aeiou$]"))
```

```
# A tibble: 22,048 x 2
   word     n_vowels
   <chr>       <int>
 1 i               0
 2 one             1
 3 morning         5
 4 when            3
 5 gregor          4
 6 samsa           3
 7 woke            2
 8 from            3
 9 troubled        5
10 dreams          4
# i 22,038 more rows
```

3. Detecting how often the word “family” comes up

```
metamorph_tidy |>
  mutate(index = line%/%10, text_to_lower = str_to_lower(word)) |>
  filter(str_detect(text_to_lower, "family")) |>
  select(index, text_to_lower)
```

```
# A tibble: 32 x 2
   index text_to_lower
   <dbl> <chr>
 1     9 family
 2    20 family
 3    26 family
 4    46 family
 5    59 family
 6    63 family
 7    72 family
 8    75 family
 9    76 family
10    76 family
# i 22 more rows
```

Regular Expression :

1.Counting how many words are in each line of text (top 5)

```
Metamorphosis |>
  mutate(num_words = str_count(text, "\\b[A-Za-z'\\$]+\\b")) |>
  select(num_words) |>
  slice_max(order_by = num_words, n = 5)
```

```
   num_words
1         18
```

```
2          17
3          17
4          17
5          17
6          17
7          17
8          17
9          17
10         17
11         17
12         17
13         17
14         17
15         17
16         17
```

2.Highlighting words where the 3rd and 2nd characters appear again later in the word

```r
str_view(metamorph_tidy$word, "(.)(.)(.).*\\3\\2")
```

```
  [84] | <helple>ssly
 [206] | <hitti>ng
 [323] | c<areer>
 [422] | <bette>r
 [536] | <sitti>ng
 [629] | <sitti>ng
[1014] | com<pletel>y
[1309] | i<ndivid>ual
[1381] | d<resse>d
[1448] | wo<ndered>
[1455] | the<mselves>
[1513] | the<mselves>
[1517] | <diffi>cult
[1560] | m<oreover>
[1772] | <follo>wed
[1843] | <bette>r
[1850] | c<onsciousn>ess
[1963] | <bette>r
[2351] | <diffi>culty
[2514] | co<ndemned>
... and 145 more
```

3.Extracting the first word from each line of text (top 5)

```
Metamorphosis |>
  mutate(first_word = str_extract(text,"\\b[^ ]+\\b")) |>
  select(first_word)|>
  slice_head(n = 5)
```

```
   first_word
1           I
2         One
3     himself
4 armour-like
5       brown
```

Text Analysis Application :

1.Counting the numbers of positive and negative sentiments

```
get_sentiments(lexicon = "afinn")
```

```
# A tibble: 2,477 x 2
   word       value
   <chr>      <dbl>
 1 abandon       -2
 2 abandoned     -2
 3 abandons      -2
 4 abducted      -2
 5 abduction     -2
 6 abductions    -2
 7 abhor         -3
 8 abhorred      -3
 9 abhorrent     -3
10 abhors        -3
# i 2,467 more rows
```

```
get_sentiments(lexicon = "nrc")
```

```
# A tibble: 13,872 x 2
   word        sentiment
   <chr>       <chr>
```

```
 1 abacus      trust
 2 abandon     fear
 3 abandon     negative
 4 abandon     sadness
 5 abandoned   anger
 6 abandoned   fear
 7 abandoned   negative
 8 abandoned   sadness
 9 abandonment anger
10 abandonment fear
# i 13,862 more rows
```

```r
get_sentiments(lexicon = "bing")
```

```
# A tibble: 6,786 x 2
   word        sentiment
   <chr>       <chr>
 1 2-faces     negative
 2 abnormal    negative
 3 abolish     negative
 4 abominable  negative
 5 abominably  negative
 6 abominate   negative
 7 abomination negative
 8 abort       negative
 9 aborted     negative
10 aborts      negative
# i 6,776 more rows
```

```r
sentiments <- get_sentiments(lexicon = "bing")


metamorph_tidy |>
  inner_join(sentiments) |>
  count(sentiment)
```

```
Joining with `by = join_by(word)`
```

```
# A tibble: 2 x 2
  sentiment     n
  <chr>     <int>
```

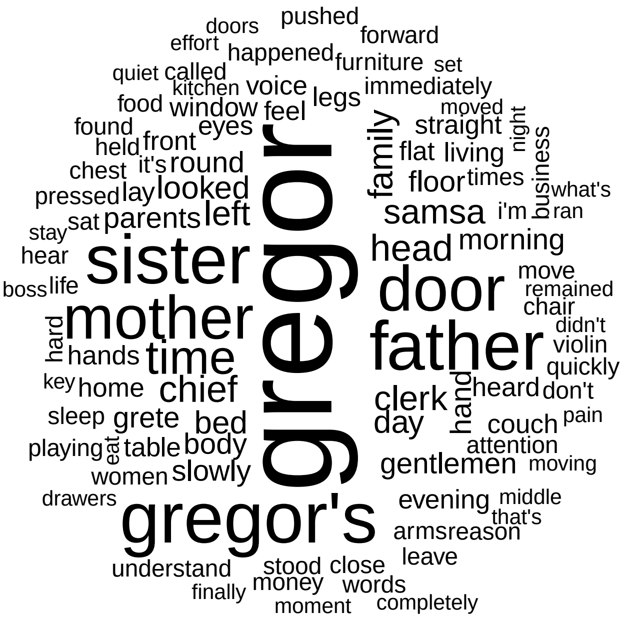
```
1 negative    604
2 positive    552
```

2.Wordcloud for “The Metamorphosis” short novel

```
words <- metamorph_tidy |>
  anti_join(stop_words) |>
  count(word) |>
  filter(word != "NA") |>
  arrange(desc(n))
```

```
Joining with `by = join_by(word)`
```

```
wordcloud(
  words = words$word,
  freq = words$n,
  max.words = 100,
  random.order = FALSE
)
```



Illustration

1.Horizontal bar chart to visualize word that contribute the most to sentiment scores

```
Joining with `by = join_by(word)`
```

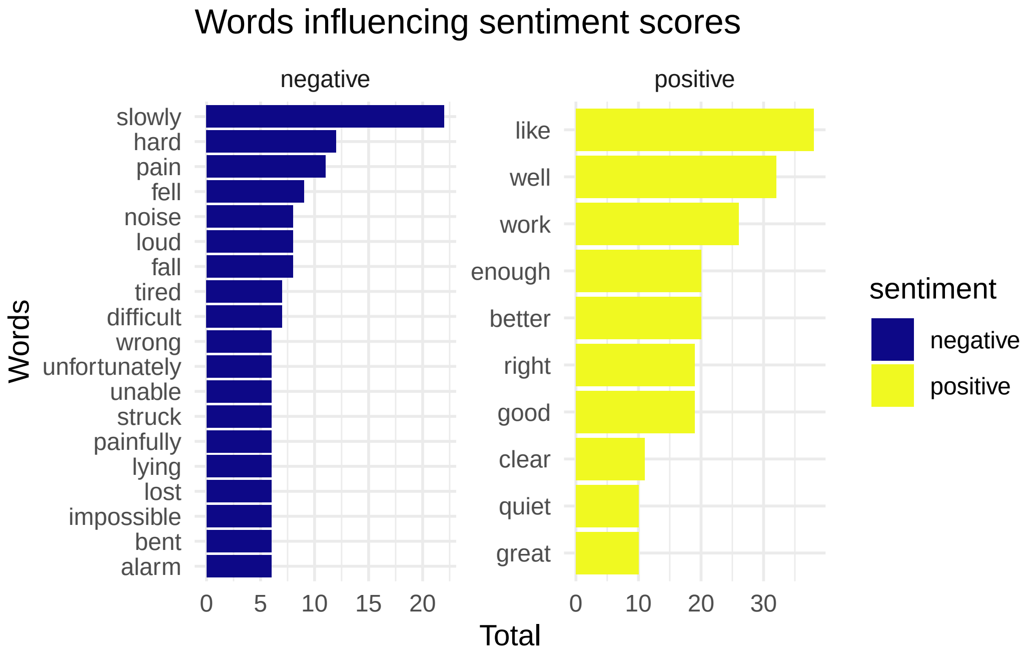


Figure 1: Figure 1. This chart lists the frequency of words that influence the sentiment scores. It highlights how, despite there being more vocabulary with negative connotations, the higher frequency of the words with positive connotations makes it balanced.

2.Chart looking at the positive/negative sentiment trajectory over the short novel

```
Joining with `by = join_by(word)`
```

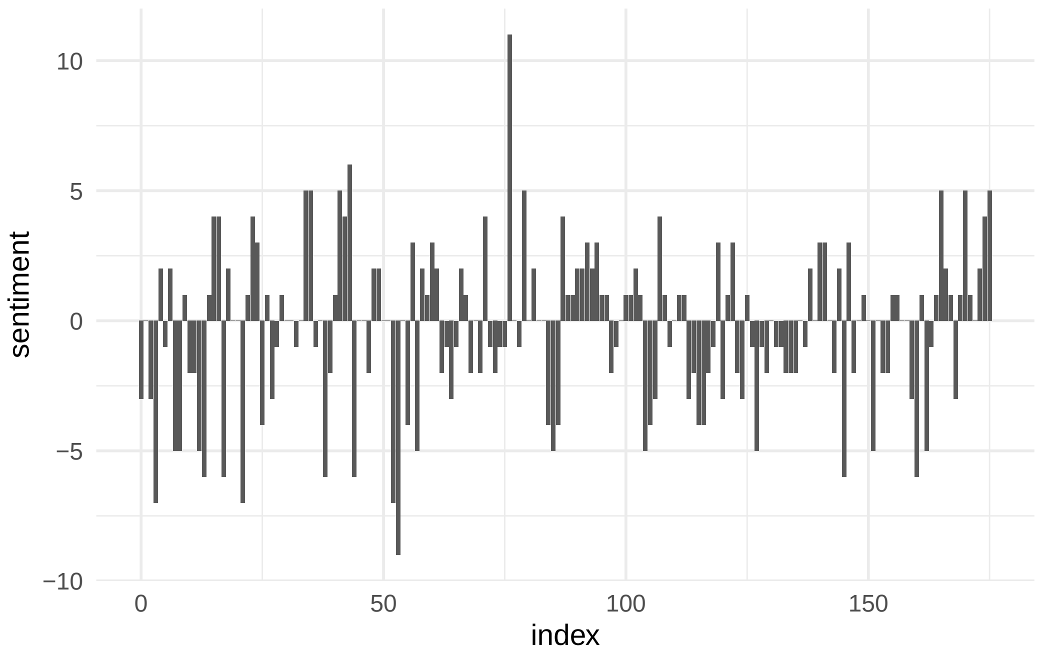


Figure 2: Figure 2. This sentiment trajectory shows how the novel has a balanced mix of positive and negative sentiment. The X-axis labelled ‘index’ is the result of approximating a chapter from every 10 lines. This highlights how the emotional tone of the novel stays relatively consistent throughout.

3.Most common words

```
get_stopwords() |> print(n = 20)
```

```
# A tibble: 175 x 2
   word      lexicon
   <chr>     <chr>
 1 i         snowball
 2 me        snowball
 3 my        snowball
 4 myself    snowball
 5 we        snowball
 6 our       snowball
 7 ours      snowball
 8 ourselves snowball
 9 you       snowball
10 your      snowball
```

```
11 yours      snowball
12 yourself   snowball
13 yourselves snowball
14 he         snowball
15 him        snowball
16 his        snowball
17 himself    snowball
18 she        snowball
19 her        snowball
20 hers       snowball
# i 155 more rows
```

```r
get_stopwords(source = "smart") |> print(n = 20)
```

```
# A tibble: 571 x 2
   word        lexicon
   <chr>       <chr>
 1 a           smart
 2 a's         smart
 3 able        smart
 4 about       smart
 5 above       smart
 6 according   smart
 7 accordingly smart
 8 across      smart
 9 actually    smart
10 after       smart
11 afterwards  smart
12 again       smart
13 against     smart
14 ain't       smart
15 all         smart
16 allow       smart
17 allows      smart
18 almost      smart
19 alone       smart
20 along       smart
# i 551 more rows
```

```r
smart_stopwords <- get_stopwords(source = "smart")
```

```
Joining with `by = join_by(word)`
```

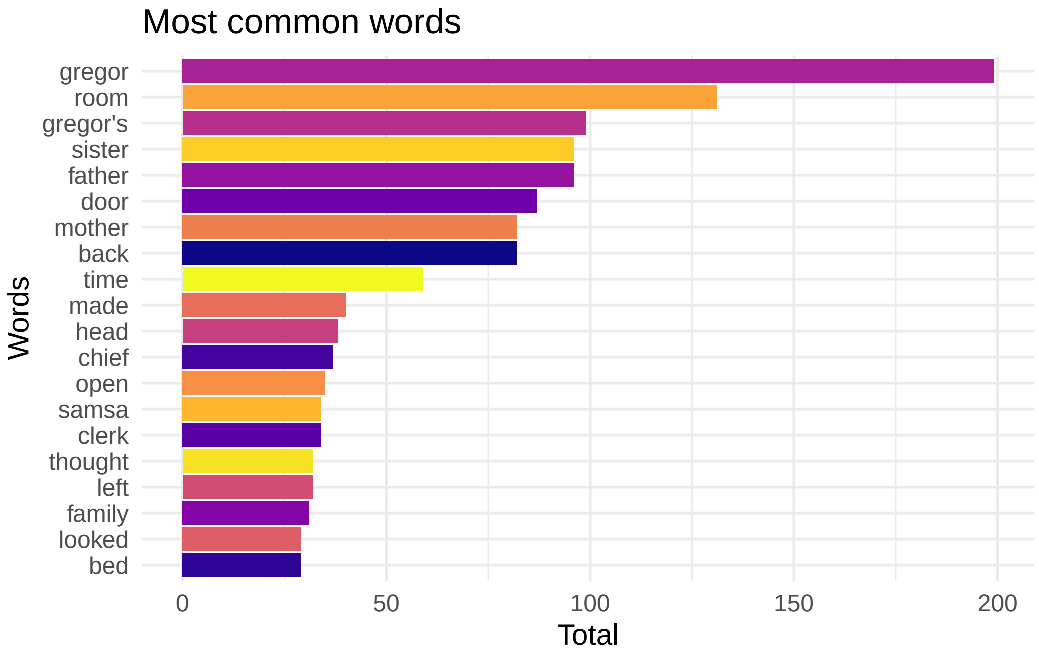


Figure 3: Figure 3.This figure shows that the name 'Gregory' is the most frequently used word, followed by 'room,' 'Gregor's,' 'sister,' and 'father.' This highlights how this short novel is centered around the protagonist and his relationship with his family.

Insight :

The short novel "The Metamorphosis" by Franz Kafka seems to be centered around the main protagonist named "Gregory" and his relationship with his family (Fig.3 & wordcloud). The setting takes place in Gregory's home, specifically his room, where he lies in bed due to tiredness and experiencing pain (Fig.1). Despite how the overall emotional tone of the novel is neutral (Fig. 2), it could imply inner conflict or complex feelings. This assumption is based on how there are more words with negative connotations than positive connotations, despite it being balanced by the higher frequency of the words with positive sentiments (Fig.1).