IT-309
EXPERIMENT 1 AND 2 REPORT

Indian Institute of Information Technology, Vadodara

Group-1

Contents

0.1 Experiment -1 - WORD CLOUD

- In this experiment, we build a Hadoop cluster of 7 nodes.
- We took our corpus as **All books of Harry Potter** $collectivesize > 7MB$
- We implemented MapReduce in Java for word count.
- For plotting graphs and curve for Zipf's law, we used Matlab.

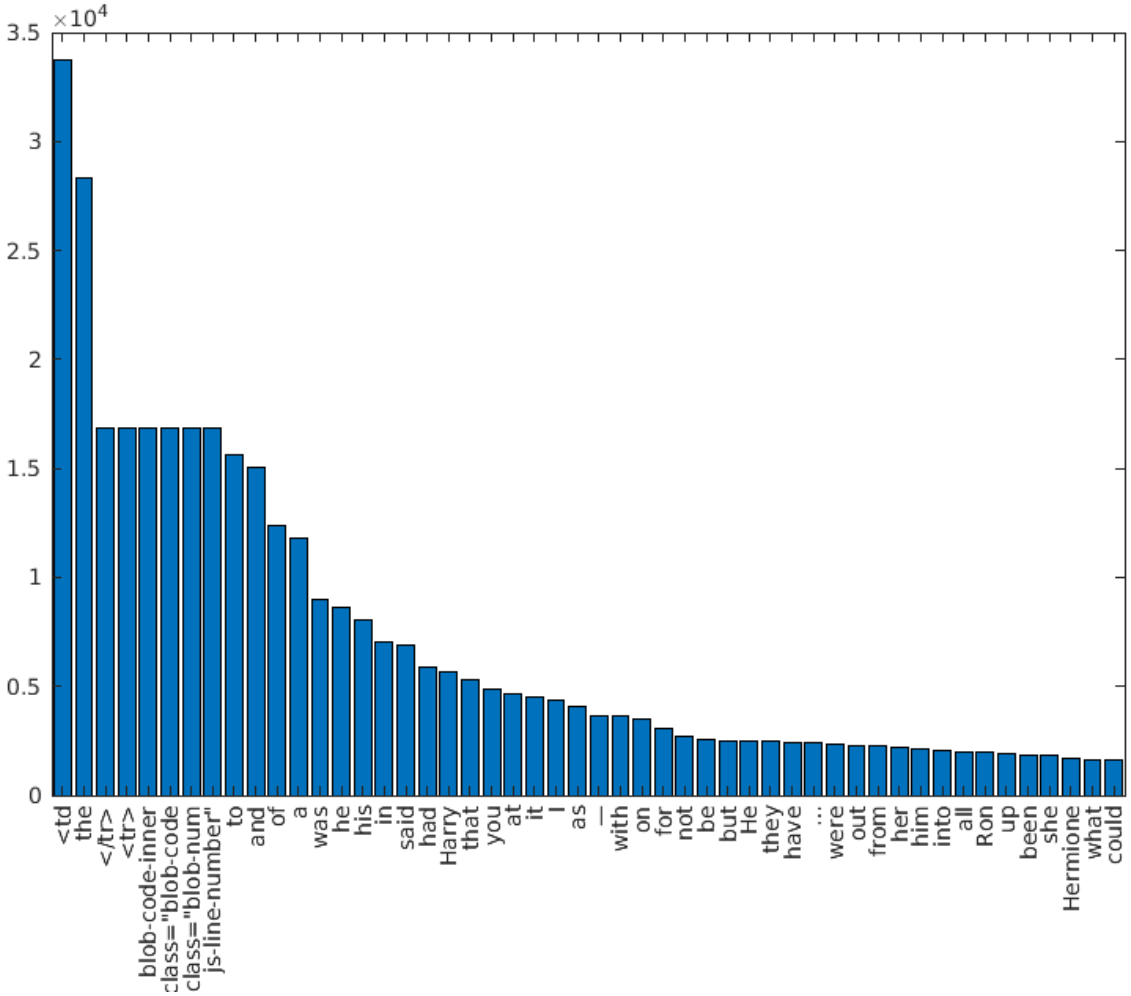
0.1.1 First fifty most frequently appearing words

Some of the most common words are shown below:

'<td'	33750
'the'	28294
'</tr>'	16875
'<tr>'	16875
'blob-code-inner'	16875
'class="blob-code'	16875
'class="blob-num'	16875
'js-line-number"'	16875
'to'	15629
'and'	15011
'of'	12375
'a'	11834
'was'	8976
'he'	8619
'his'	8053
'in'	7005
'said'	6917
'had'	5857
'Harry'	5657
'that'	5321

0.1.2 Histogram of first fifty most frequently appearing words

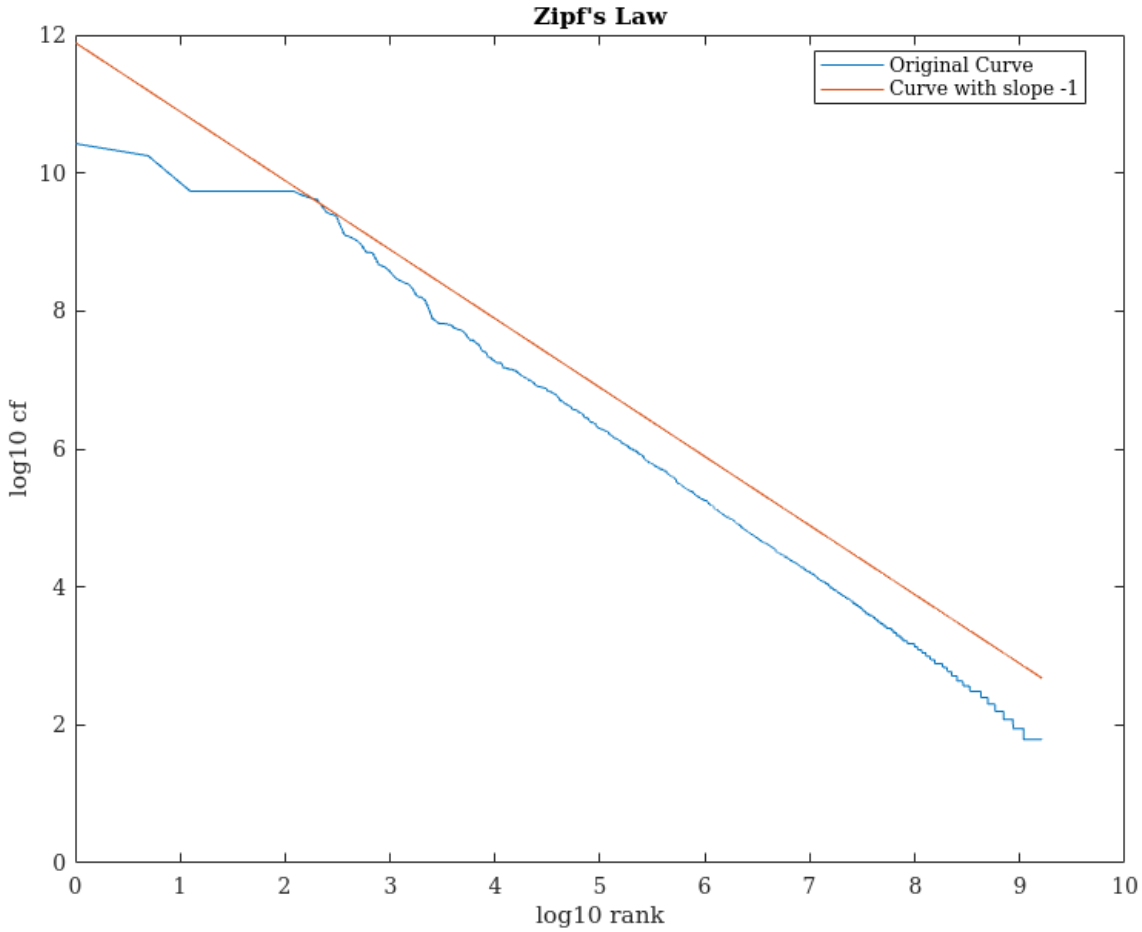
- The plot shows that '<**td**' is most frequently appearing term in the corpus with the frequency of 33750.
- Most frequently appeared english word is '**to**'.
- The term '**Harry**' is appeared 5657 times in the corpus.



0.1.3 Validating Zipf's Law

- As we know that Zipf's law is: $cf_i \propto \frac{1}{i}$, where cf_i is Collection Frequency of the i^{th} most common term.
- We plotted Zipf's function as $logcf_i = logc - logi$.

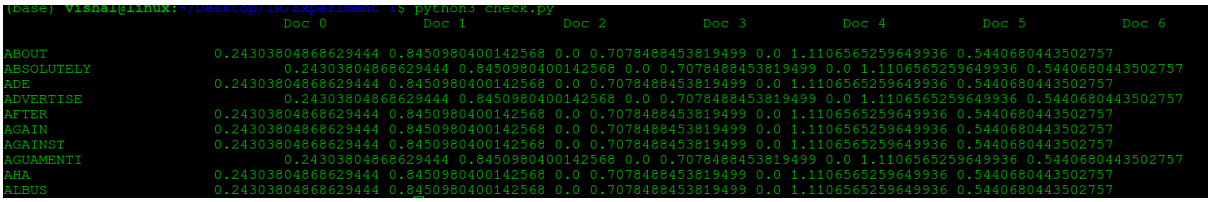
- A plot with slope -1 is also shown corresponding to Zipf's function.
- Then, we applied **method of least squares** to calculate slope and intercept.
- The **intercept** of the plot is **11.8894**.
- The **slope** is **-1.1002**.
- The fit of the data to the law is not particularly good, but good enough if we compare it to the curve with slope -1.



0.2 Experiment -2 - Building Term-Document Matrix (TF-IDF)

- We have used same corpus for building Term-Document Matrix.

- Firstly, we calculated term frequency $tf_{t,d}$ for eaxch term t and document d and and then inverse document frequency idf_t for each term t.
- Then, we calculated the weight as $tf\text{–}idf_{t,d} = tf_{t,d} \times idf_t$



The result shows the Term Document matrix for first 10 term.