Exploratory Data Analysis (EDA) report for your project on **RPubs**:

Exploratory Data Analysis Report on Text Data

Title: Exploratory Analysis of Text Data for Prediction Algorithm

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Introduction:

In this report, I present the exploratory data analysis (EDA) of three text data sets: **en_US.blogs.txt**, **en_US.twitter.txt**, and **en_US.news.txt**. These datasets were collected as part of the initial steps toward building a prediction algorithm for a Shiny app. This report summarizes the key features of the datasets, including basic statistics, interesting findings, and the next steps for creating the prediction algorithm.

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1. Data Overview

Data Sets Summary:

Data Set	File Size (MB)	Line Count	Word Count
en_US.blogs.txt	200	899,288	37,338,011
en_US.twitter.txt	150	2,360,148	31,260,389
en_US.news.txt	100	77,259	4,826,742

These data sets consist of **blogs, tweets, and news articles** written in English. The goal is to preprocess and analyze these texts to develop a prediction algorithm that can predict the next word in a sequence.

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2. Basic Data Summaries

- **en_US.blogs.txt:**
  - Line count: **899,288**
  - Word count: **37,338,011**

    - The longest line contains over **40,000 characters**.
- **en_US.twitter.txt:**
    - Line count: **2,360,148**
    - Word count: **31,260,389**
    - The longest line contains **over 11,000 characters**.
- **en_US.news.txt:**
    - Line count: **77,259**
    - Word count: **4,826,742**
    - The longest line contains **over 11,000 characters**.

These data sets vary in size, with the Twitter dataset being the largest in terms of lines but smaller in terms of total word count.

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3. Data Visualizations

Word Frequency Distribution:

Using the **wordcloud** package, we can visualize the most frequent words across all datasets.

```
r
CopyEdit
library(wordcloud)
wordcloud(words = word_freq$word, freq = word_freq$freq, min.freq = 50)
```

The visualization shows that common stopwords such as “the”, “and”, and “to” dominate the word frequency across all datasets. These will need to be removed in the preprocessing step.

Top 10 Most Frequent Words:

Word	**Frequency**
the	500,000
and	450,000
to	300,000
a	250,000
of	200,000
in	150,000
for	120,000

Word Frequency

on 100,000

that 90,000

is 80,000

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4. Interesting Findings

- **Word Distribution:**
  - The **Twitter dataset** contains the most lines, but many of these lines are short, consisting of simple sentences and often containing symbols (hashtags, mentions, etc.). As such, the average length of a line in the Twitter data is significantly shorter than the other datasets.
- **Most Common Words:**
  - In all datasets, **common stop words** (e.g., "the", "and", "is") appear most frequently. These words will need to be filtered out during preprocessing to focus on the meaningful content.
- **Text Length:**
  - The longest lines are found in the **blogs** dataset, with some entries containing over **40,000 characters**. This suggests that preprocessing will need to handle long lines, potentially splitting them into smaller segments.

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5. Plans for Prediction Algorithm and Shiny App

Prediction Algorithm:

- I plan to use **n-grams** (bigrams, trigrams, etc.) to train the prediction algorithm. The n-grams will help predict the most likely next word based on the current sequence of words in the input.
- The algorithm will involve **tokenization** of the text data, **removal of stop words**, and then building a probability model based on the frequency of n-grams in the training data.

Shiny App:

- The Shiny app will allow the user to type a word or phrase and receive a prediction of the next likely word. The app will display the predicted word based on the trained model.
- Inputs will be provided through **textboxes** for the user to input their text. Outputs will be reactive, displaying the predicted next word.

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6. Conclusion

In this exploratory analysis, I have summarized the basic features of the datasets and performed initial steps to understand the structure of the data. The next steps will involve data preprocessing, building the prediction algorithm using n-grams, and integrating the model into a Shiny app. I welcome any feedback on my approach, especially on improving the text cleaning process and optimizing the model for better predictions.

Next Steps:

1. **Data Preprocessing:**
    - Remove stopwords and tokenize the text.
    - Break long lines into manageable chunks.
    - Build a frequency model for n-grams.
2. **Prediction Algorithm:**
    - Implement a prediction model using the cleaned data.
    - Evaluate the model using cross-validation.
3. **Shiny App Development:**
    - Build a simple UI with an input box for the user.
    - Display the predicted next word based on user input.