## Text political bias classifier

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We will be building an application that allows users to determine the political lean of a given piece of text, with special emphasis placed on news media.

## 1. Choice of Dataset

For this project, we will use [a dataset](https://www.kaggle.com/datasets/mayobanexsantana/political-bias/data) containing over 3000 political news articles with bias classifications. The dataset includes:

* Title (The headline of the article)
* Link (The URL to the full article)
* Text (The full content of the article)
* Source (The name of the news outlet)
* Bias (labeled as *left, lean left, center, lean right, right*)

We chose this dataset because political bias detection is a pressing issue in media literacy. The dataset is well-structured and provides a diverse set of articles from various sources, making it feasible for supervised learning.

## 2. Methodology

This project will involve natural language processing (NLP) and machine learning (ML) classification techniques to predict an article’s political bias.

### a. Data Preprocessing

To prepare the dataset for training, we will:

* Clean text data (investigating the need for the removal of punctuation, stopwords, special characters, and any other artifacts of the transfer from an article’s webpage to the dataset)
* Tokenize and lemmatize words for efficient processing
* Feature extraction

### b. Machine Learning Model

Our goal is to classify an article’s political bias based on its text. We will experiment with the following models:

1. Baseline model: Logistic Regression
2. Traditional ML models: e.g. Random Forest
3. Deep Learning models

### c. Evaluation Metrics

Split the data into training and testing sets, and since this is a multi-class classification problem, we will use:

* Confusion matrix (to analyze misclassifications)
* Accuracy, Precision, Recall, and F1-score (to evaluate performance)
* Word cloud analysis (to visualize the most influential words per bias category)

We will compare model performance against a baseline accuracy (e.g., predicting the most common class) and aim for at least 80% accuracy.

## 3. Application

We will integrate our model into a web-based app where users can:

1. Input: Paste a news article or provide a URL.
2. Processing: The model will analyze the article text and classify its bias.
3. Output: Display the predicted bias (*left, lean left, center, lean right, right*), explain key contributing words, and provide a bias heatmap.

## 4. Conclusion

This project aims to develop an AI-powered bias detection tool that helps users critically evaluate news articles. By leveraging NLP, machine learning, and interpretability methods, our model will provide transparency into political bias in news media.