

# News Headline

## Generator using GRU-based Encoder-Decoder

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# Introduction

- Automatic headline generation = Summarizing news articles into concise, informative titles.
- Uses Natural Language Processing (NLP) and Deep Learning.
- Replaces manual effort with AI-driven summarization.

# Problem Statement

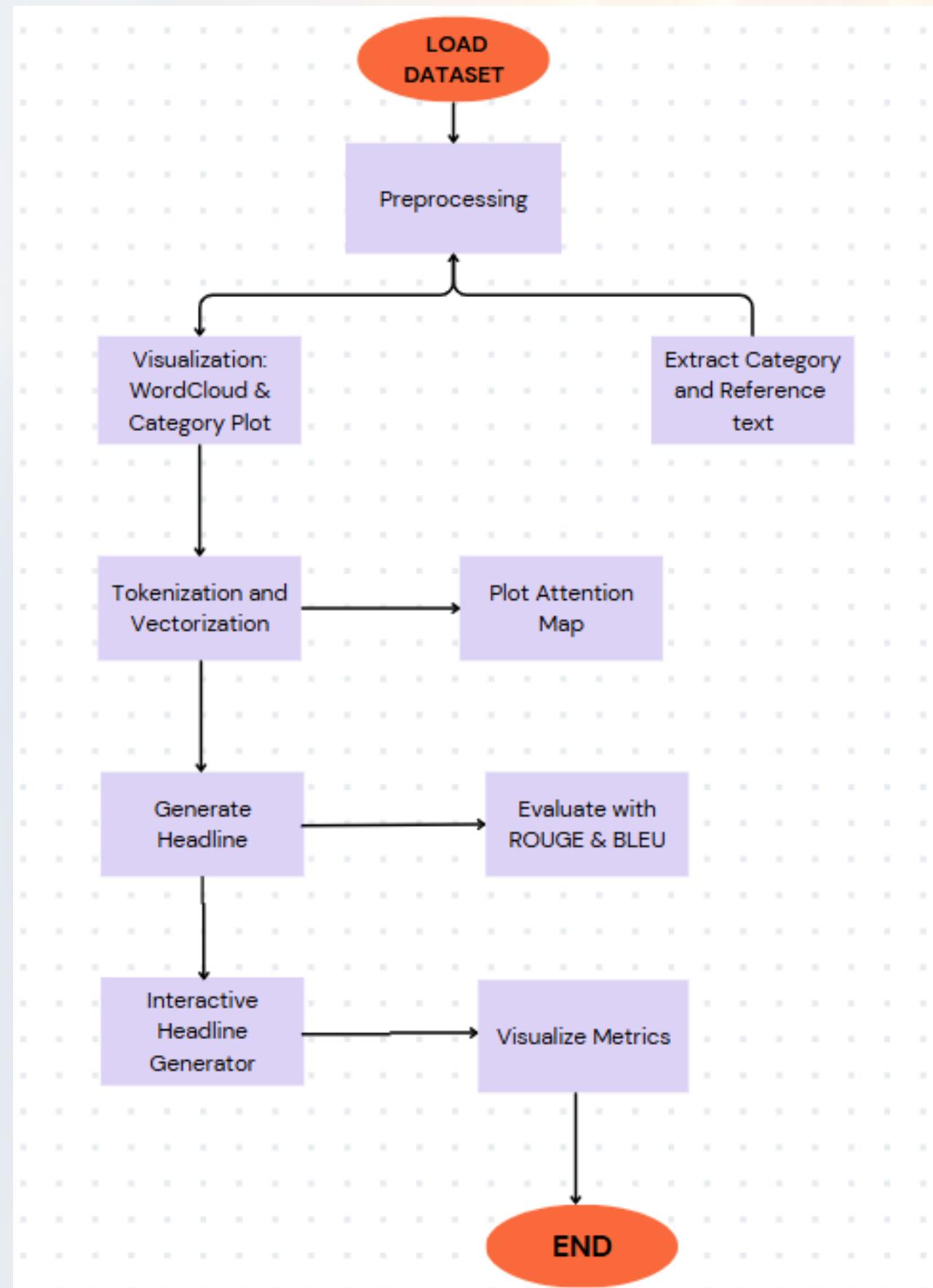
- News articles are lengthy; users want quick insights.
- Manual headline writing is subjective, slow, and inconsistent.
- Goal: Build a model that auto-generates high-quality headlines from raw news text.

# Project Objective

**Implement and compare encoder-decoder architectures: LSTM/GRU, LSTM with Attention, and Transformer with Self-Attention.**

- Structure: News text + Corresponding Headline.
- Preprocessing:
  - Lowercasing
  - Punctuation removal
  - Stopword removal (if applied)
  - Tokenization

# Model Architecture diag:-



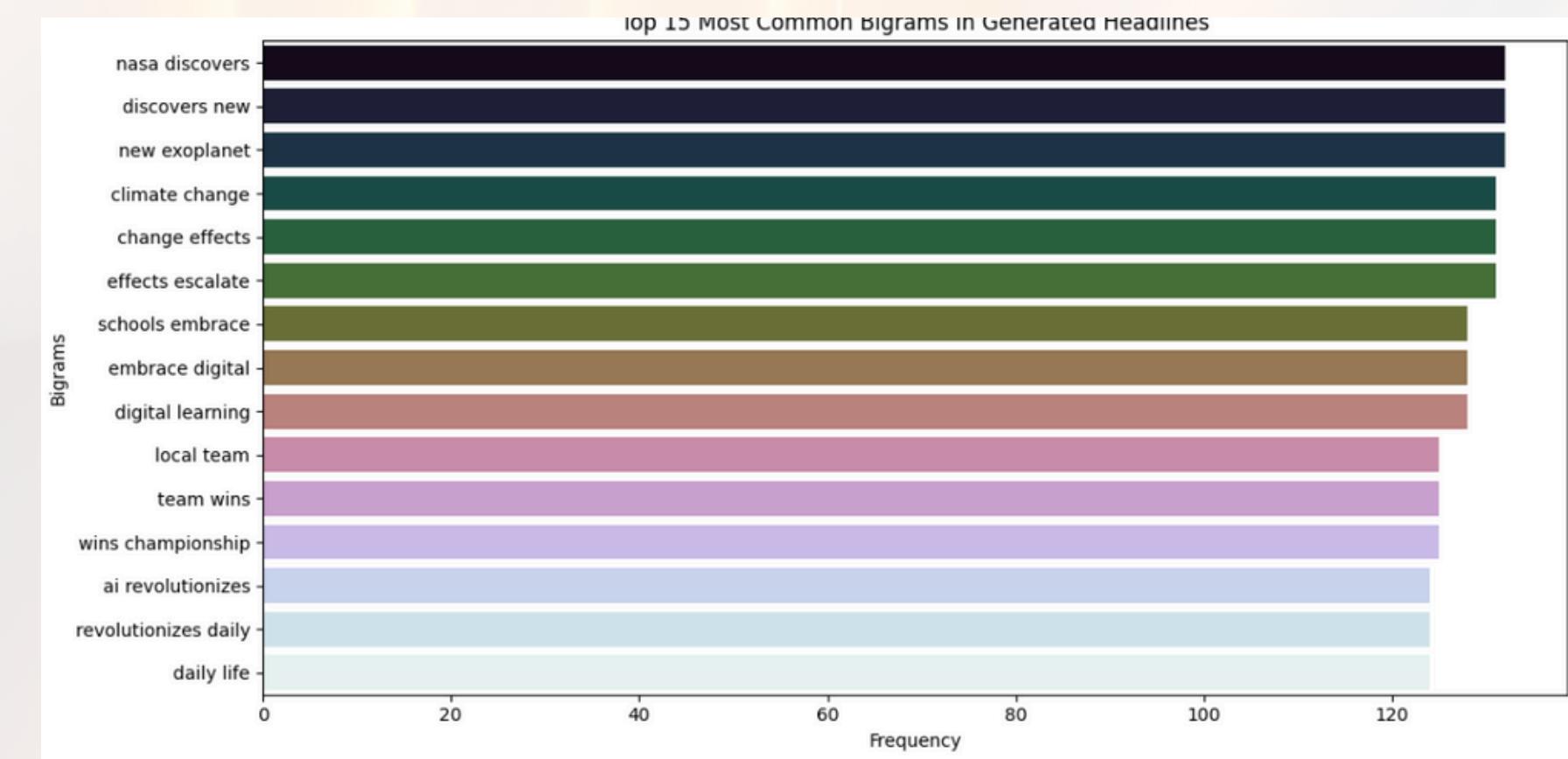
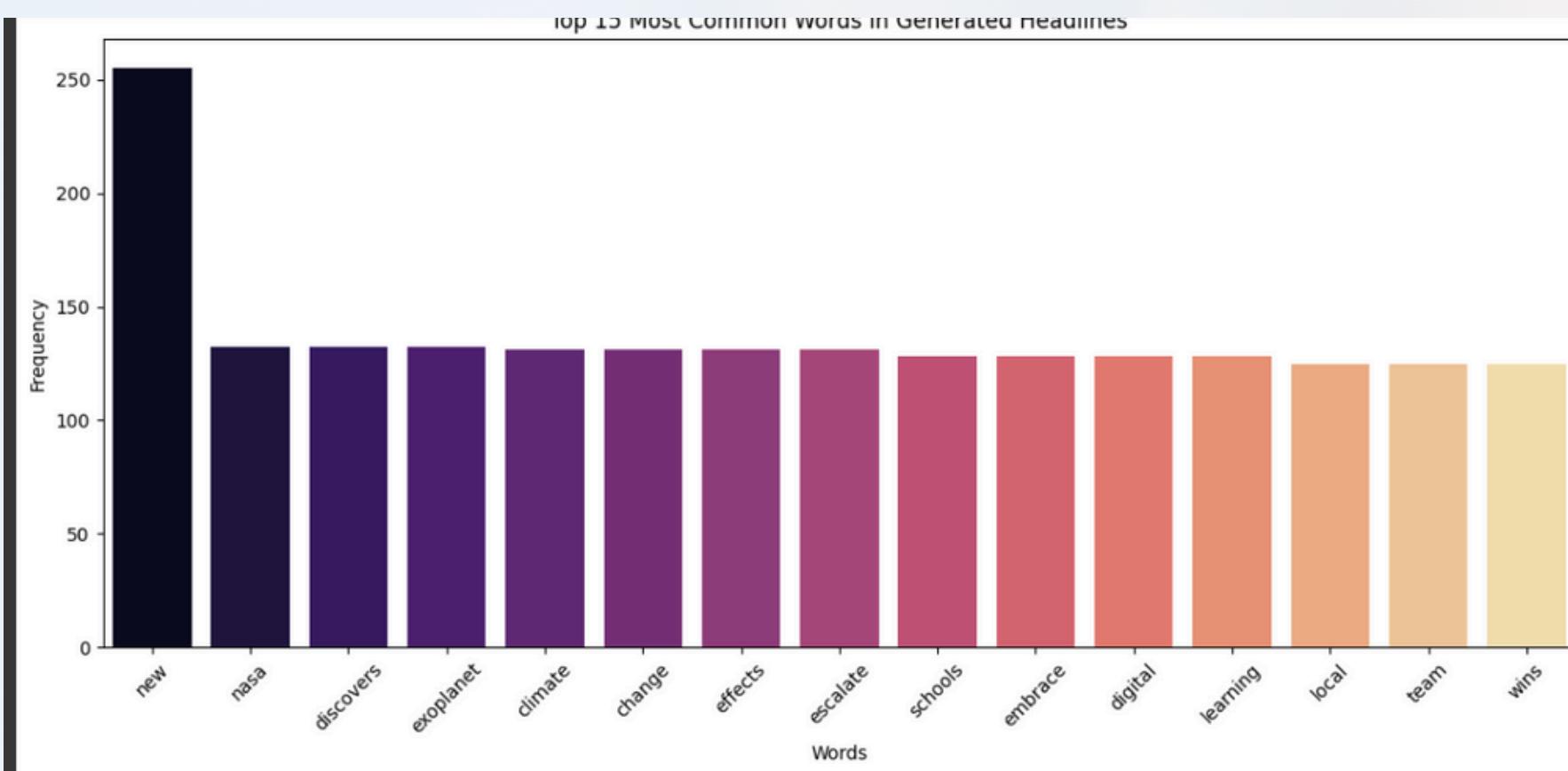
# Preprocessing Pipeline

- Importing and cleaning the dataset.
- Splitting data into training and test sets.
- Tokenizing input text and headlines.
- Padding sequences for equal input length.

# Evaluation Metrics

- ROUGE(Recall-Oriented Understudy for Gisting Evaluation) Score - Compares overlap between generated and true headlines.
- BLEU(Bilingual Evaluation Understudy) Score - Measures n-gram overlap.
- Qualitative Evaluation: Human-readable relevance

# 15 Most Common words or diagrams



# Conclusion

- Developed a GRU-based Encoder–Decoder model.
- Generated concise headlines from full news articles.
- Open scope for improvements using advanced techniques.

# References

**GRU :-**

<https://www.geeksforgeeks.org/gated-recurrent-unit-networks/>

**LSTM :-**

<https://www.geeksforgeeks.org/understanding-of-lstm-networks/>

**Bahdanau :-**

<https://machinelearningmastery.com/the-bahdanau-attention-mechanism/>



**Thank You!**  
Any Questions?

