BE PROJECT

COMPREHENSION BOT

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INTRODUCTION

- Students are required to refer to various books and resources. This becomes a tedious task to refer to multiple books and read redundant information again and again wasting the student's time.
- Our goal is to create a bot that is given multiple pdfs as input and gives a combined version of them as output, eliminating the redundant information.
- This project will involve use of mutiple technologies such as OCR, multi-document text-summarization, question-answering system etc.
- We plan to use state-of-the art models.

PROBLEM DEFINITION

- For specific coursework, a student must refer to books from several publishers, carefully reading each one to extract only the necessary and relevant information.
- Making a compact version of numerous journals, research papers, and books becomes challenging for research-minded students while incorporating novel concepts.
- Simply combined PDFs contain inessential data and lack images, diagrams, or any visualizations.

We, therefore, suggest a comprehension bot to address these issues and broaden the scope of its application.

SCOPE OF PROJECT

- A comprehensive bot that can read PDF books and respond to questions based on them.
- The bot should also have the ability to read various books, draw links between them, and integrate two (or more) books.
- It should be concise enough to provide all essential information and remove redundancy from extracted data.
- The bot should be able to provide diagrams, charts, and formulas in addition to text.
- Mappings between the uploaded syllabus and the merged PDF copy to help students comprehend their courses.

LITERATURE SURVEY

- Multi-document text summarization involves compressing, extracting, removing redundancy, ranking/selecting sentences, and ordering them, with previous attempts [1][2] relying on statistical tools that have performed poorly.
- Previous extractive summarization works used simple features (key phrases, tf-idf, sentence positions [3][4][5]) to rank sentences and applied compression ratio to select top redundant sentences.
- In MDTS, redundancy removal is crucial, and some papers [6][7] use the MMR technique [8] to select top-ranked sentences and reduce redundancy during summary generation.

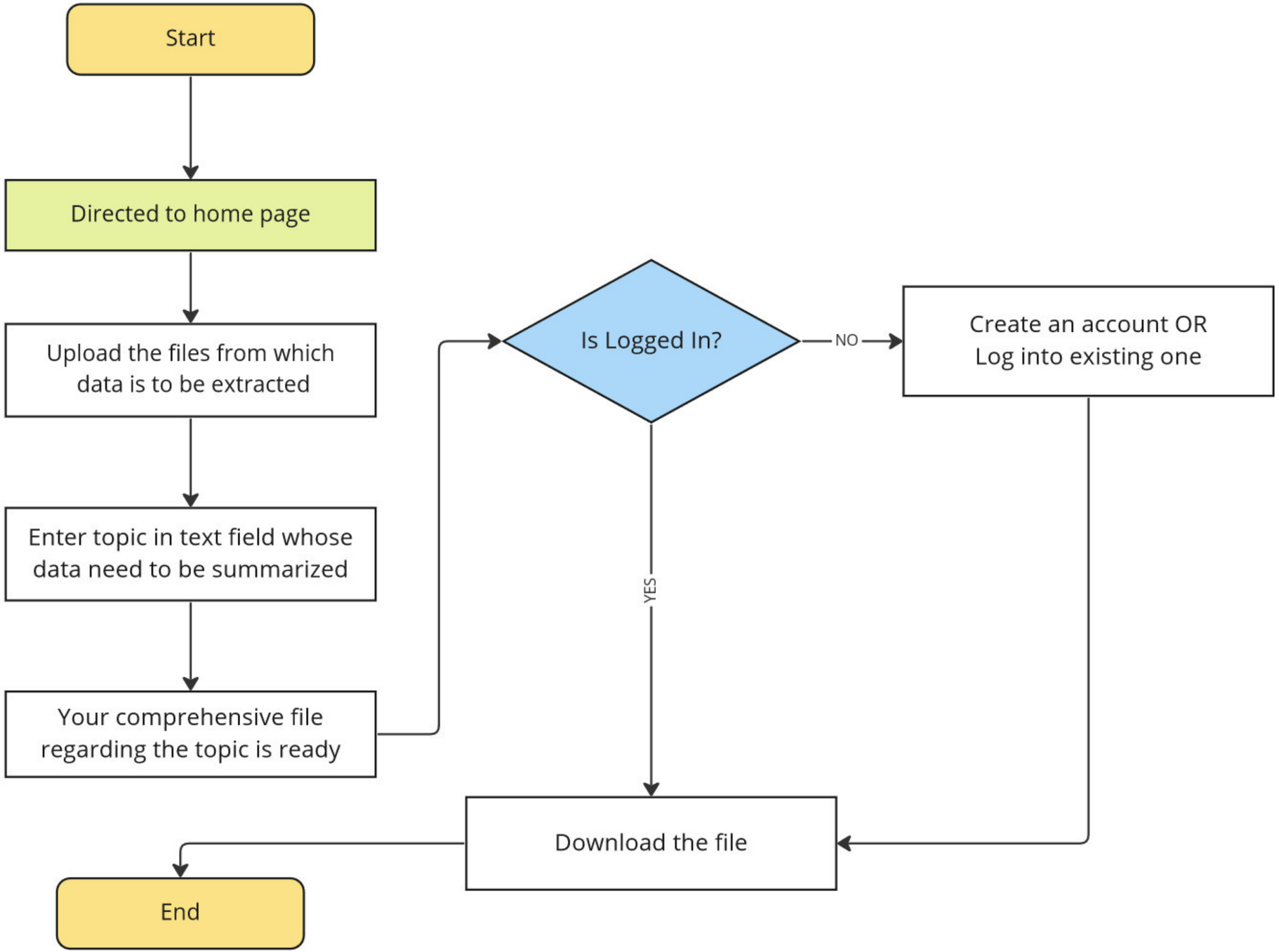
LITERATURE SURVEY

- To prevent redundancy and ensure coverage, clustering-based approaches are used to similar group sentences and choose representative sentences from each group to create a summary [8][9][10], with the quality of clusters depending on the sentence similarity measure used.

- Clustering-based methods are not as accurate as supervised methods that use annotated data since they rely on heuristics and assumptions about similarity.

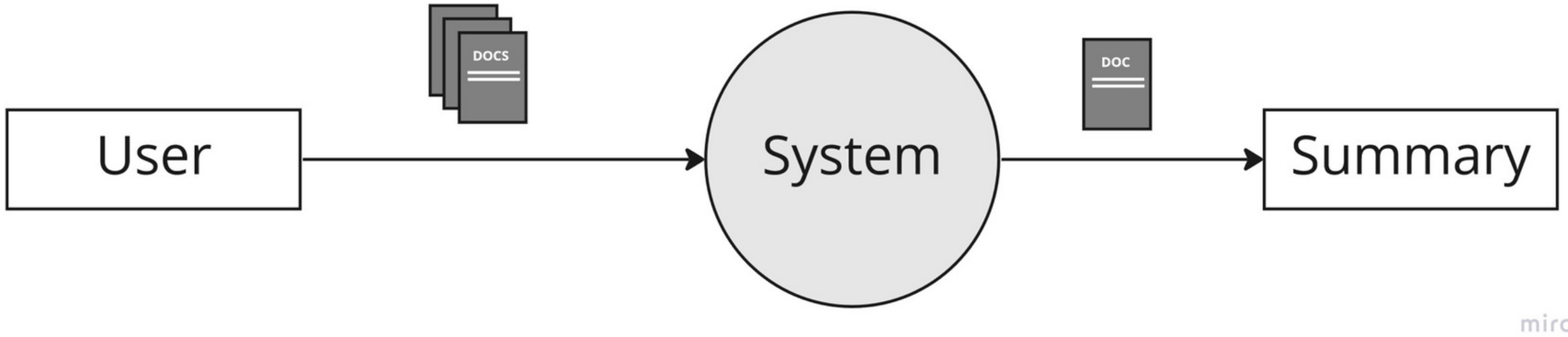
- They may not be effective at capturing the overall coherence and meaning of the source documents, since they only consider sentence-level similarity.

USER FLOW DIAGRAM



FUNCTIONAL MODEL

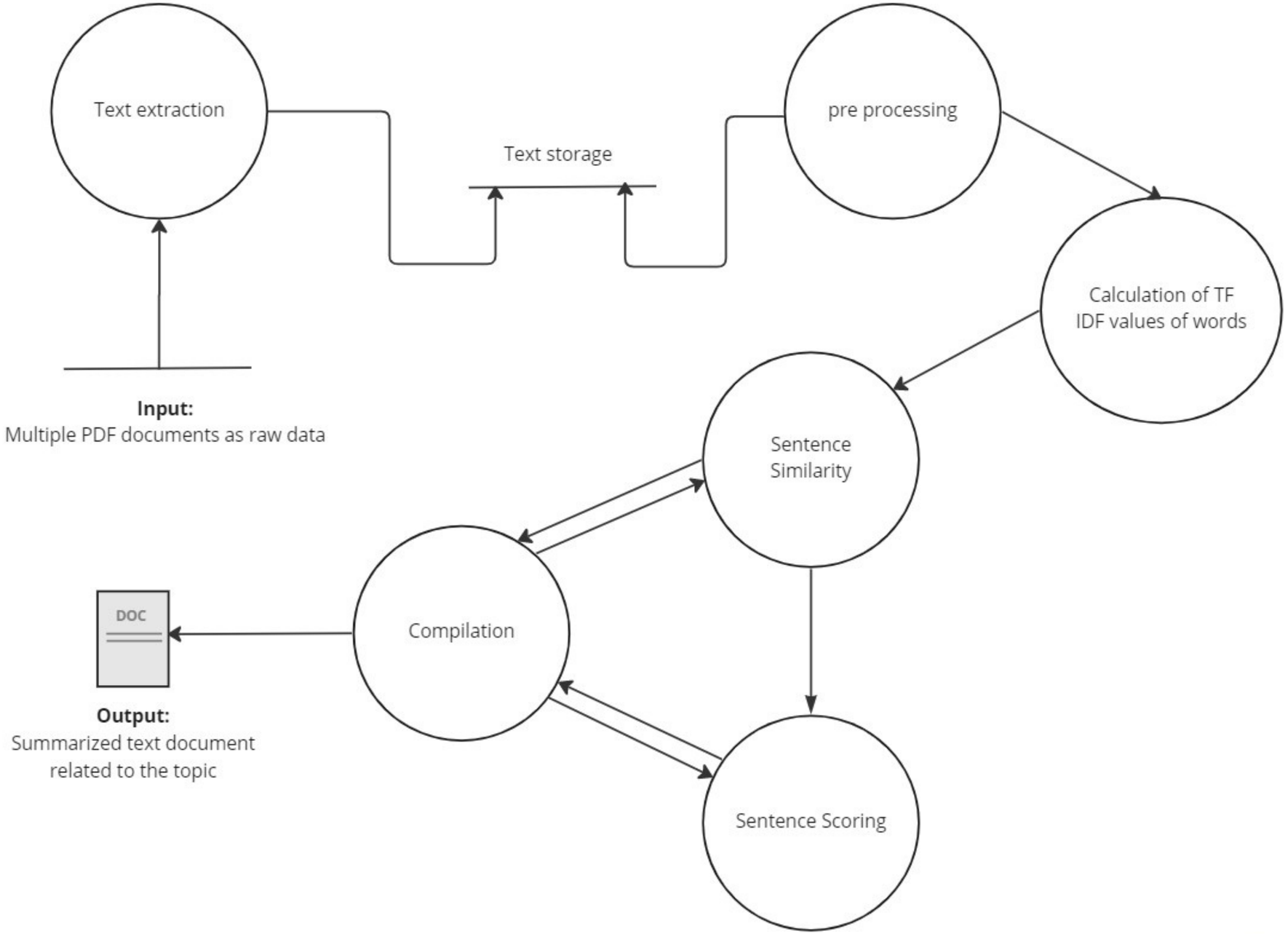
DFD Level 0



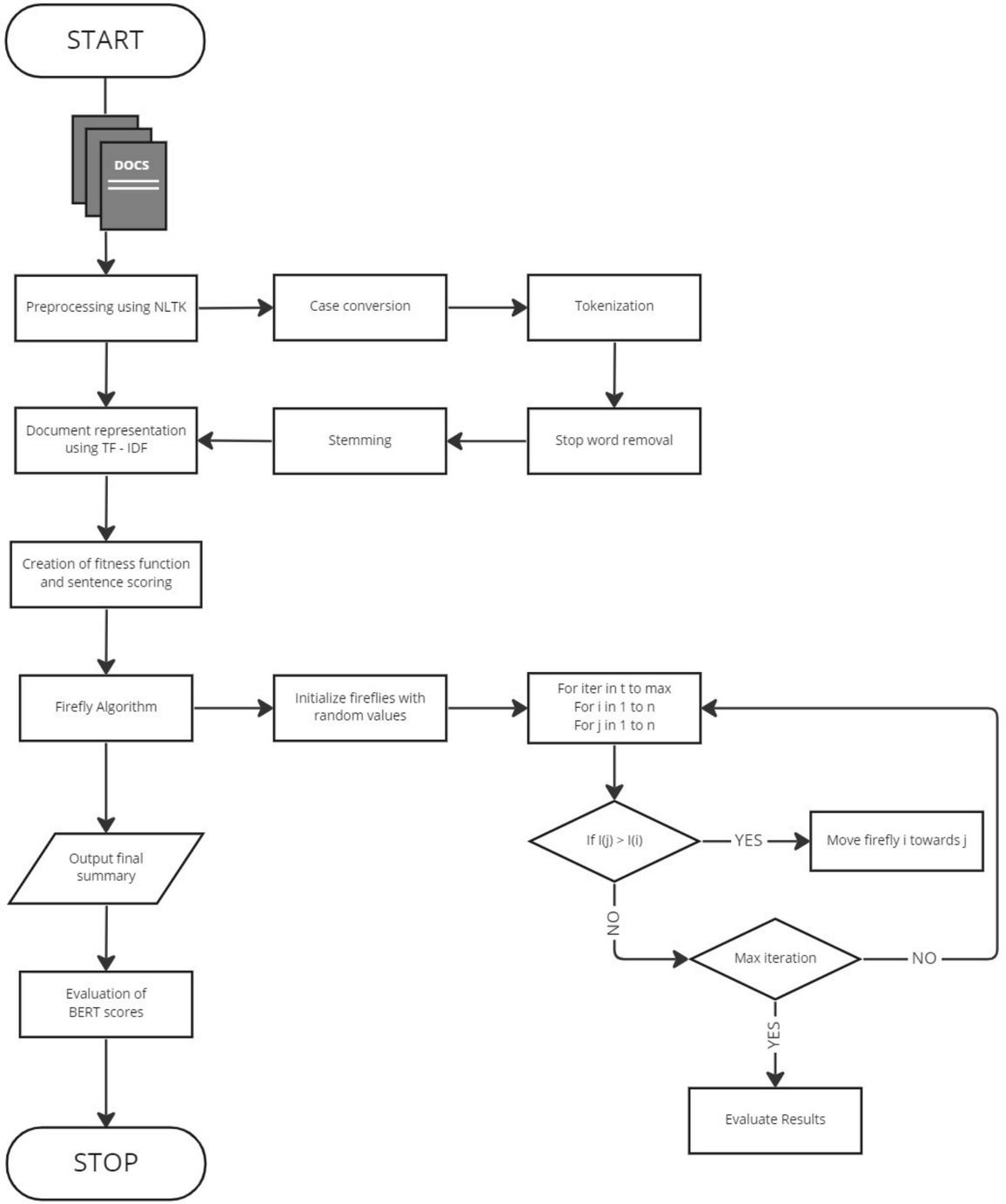
It's designed to be an abstract view, showing the system as a single process with its relationship to external entities. It represents the entire system as a single bubble with input and output data indicated by incoming/outgoing arrows.

FUNCTIONAL MODEL

DFD Level 1



ARCHITECTURAL DIAGRAM



DATASET

- The DUC dataset is a famous collection of papers in document summarization and text-mining studies.
- Both single-document and multi-document summarization tasks, which summarize one or more primary documents into a concise summary, are included in the dataset.
- The DUC dataset has been extensively used in the creation and assessment of summarization algorithms.

EVALUATION METHOD

- The ROUGE error matrix is a method for evaluating the performance of text summarization systems.
- The drawback is that it doesn't account for the semantic similarity between the source and the derived summary.
- BERTScore metric uses pre-trained transformer models such as BERT to compare the semantic similarity between the generated summary and the source documents.
- BERTScore has been shown to correlate strongly with human judgment and outperforms ROUGE metrics in many cases.

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THANK YOU