**ASSIGNMENT NO: 07**

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**Problem Statement:**

Text Summarization

**Objectives:**

1. To explore NLTK for performing text summarization.
2. To learn concepts of Text Summarization in NLP.

**Theory:**

1. **What is purpose of Text Summarization**

**A-1:** Text Summarization is the process of reducing a large amount of text into a shorter version while preserving key information and meaning. It is essential for handling large volumes of text in applications such as news summarization, document analysis, and search engines.

1. **Types of summaries**

**A-2:** Type of Summaries consists of:

* **Extractive Summarization**: Selects key sentences or phrases directly from the text without altering their wording.
* **Abstractive Summarization**: Generates new sentences that capture the meaning of the text using natural language generation (NLG).
* **Single-document Summarization**: Summarizes one document at a time.
* **Multi-document Summarization**: Summarizes multiple related documents to produce a coherent summary.

# Algorithm /Implementation:

1. **Preprocessing:**

* Tokenize sentences.
* Remove stop words and perform stemming/lemmatization.

1. **Building Sentence Similarity Matrix:**

* Convert sentences into vectors using word embeddings (TF-IDF, Word2Vec, or BERT).
* Compute cosine similarity between sentences.

1. **Applying PageRank:**

* Construct a graph where nodes are sentences.
* Apply the PageRank algorithm to rank the importance of each sentence.

1. **Selecting Top Sentences**:

* Extract top-ranked sentences based on PageRank scores.
* Arrange them in the original document order.

1. **Output the Summary.**

# Platform: 64 –bit Open source Linux, IBM Watson Cloud

**Input:**

**Output:**

**Conclusion:** Hence, learned the concepts of Text Summarization.

**FAQs:**write answers

1. What is purpose of Text Summarization?
2. Types of summaries.
3. Explain how performance evaluation of text summaries is made.
4. List the various applications of text summarization in NLP