



Experiment No. 8
Implement Text Similarity Recognizer for the chosen text documents.
Date of Performance:
Date of Submission:



Aim: Implement Text Similarity Recognizer for the chosen text documents.

Objective: Understand the importance of Implementing Text Similarity Recognizer for the chosen text documents.

Theory:

1. **Preprocess the Text Data:**
 - Tokenization
 - Stopwords removal
 - Lemmatization or stemming
2. **Feature Extraction:**
 - TF-IDF Vectorization
 - Word Embeddings (e.g., Word2Vec, GloVe)
 - Sentence Embeddings (e.g., Sentence-BERT)
3. **Compute Similarity:**
 - Cosine Similarity
 - Euclidean Distance
4. **Evaluate Similarity:**
 - Compare and interpret the similarity scores.

Code:

```
import pandas as pd
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics.pairwise import cosine_similarity
# Define two sentences to compare
sentenceOne = 'My house is empty today'
sentenceTwo = 'Nobody is at my home'
documents = [sentenceOne, sentenceTwo]
# Initialize the TF-IDF Vectorizer
tfidf = TfidfVectorizer()
# Fit and transform the documents to get the TF-IDF matrix
sparseMatrix = tfidf.fit_transform(documents)
# Convert the sparse matrix to a dense matrix
docTermMatrix = sparseMatrix.todense()
# Create a DataFrame to visualize the TF-IDF matrix
df = pd.DataFrame(
    docTermMatrix,
    columns=tfidf.get_feature_names_out(),
    index=['sentenceOne', 'sentenceTwo']
)
# Calculate the cosine similarity between the two sentences
simScore = cosine_similarity(df, df)[0, 1]
# Identify the words that appear in both sentences (non-zero entries)
match_keys = df.isin([0]).sum(axis=0) # Sum of zeros in the columns
match_words = match_keys[match_keys.values == 0].keys() # Words with no zeros in both sentences
# Print results
print(f'Cosine Similarity: {round(simScore, 2)}')
print(f'Matching Words: {list(match_words)}')
```



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Output:

```
(venv) PS D:\Vartak college\sem 7\NLP\EXP\New folder> python .\exp8.py
```

Cosine Similarity: 0.25

Matching Words: ['is', 'my']

Conclusion: Implementing a Text Similarity Recognizer involves several crucial steps: preprocessing the text data, extracting meaningful features, computing similarity measures, and interpreting the results. In this example, we utilized TF-IDF Vectorization for feature extraction and Cosine Similarity for computing similarity between text documents.