

Documentation: Real-Time Word Meaning & Synonym Finder

1. Project Overview

This project is a simple Streamlit web application that enables users to search for the **meaning** and **synonyms** of any English word in real time

2. Dataset Description

Unlike traditional machine learning projects, this app does not use a manually collected dataset. Instead, it utilizes:

- **WordNet**: A large lexical database of English nouns, verbs, adjectives, and adverbs.
- **Open Multilingual WordNet (omw-1.4)**: Enhances WordNet with multilingual and extended definitions.
- **TextBlob's Word Interface**: Offers easy access to synsets related to a given word.

3. Data Preprocessing

No custom data preprocessing is required in this project, but the following steps are essential:

- The app **downloads** the required NLTK corpora at runtime:

```
# Download necessary NLTK data |
nltk.download('wordnet')
nltk.download('omw-1.4')
```

- The input word from the user is passed to two functions:
 - `get_word_meaning()` – fetches the definition

```
# Function to get the word meaning
def get_word_meaning(word):
    synonyms = wordnet.synsets(word)
    if synonyms:
        return synonyms[0].definition()
    else:
        return "No definition found."
```

- `get_related_words()` – fetches related synsets to extract synonyms.

```
# Function to get related (synonym) words
def get_related_words(word):
    blob = Word(word)
    try:
        return blob.synsets # Using synsets as .synonym() is not a real method
    except:
        return []
```

4. Model Training

This project **does not involve machine learning model training**. Instead, it relies on pre-existing lexical databases (WordNet and TextBlob's access to it) to retrieve linguistic information.

Thus, this section is not applicable in the traditional sense but represents the core logic functions:

- Querying synsets from WordNet.
- Extracting lemmas (word variants) for synonym generation.

5. Web App Interface

The app is built using **Streamlit**, which provides an interactive web interface.

Key UI Elements:

- Title:

```
# Streamlit app layout
st.title("🎨 Real-Time Word Meaning & Synonym Finder")
```

- **Text Input:**

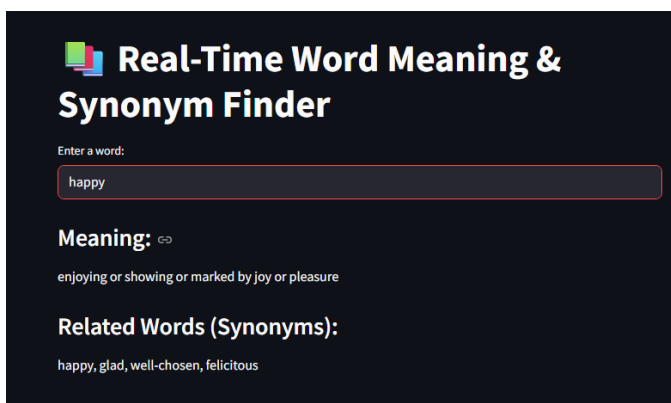
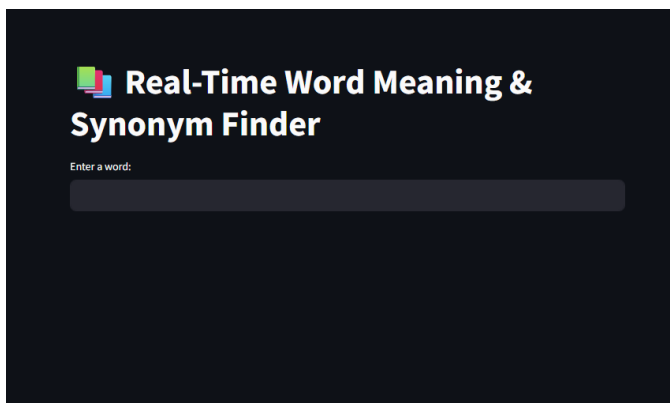
```
word_input = st.text_input("Enter a word:")

if word_input:
    meaning = get_word_meaning(word_input)
    related = get_related_words(word_input)

    st.subheader("Meaning:")
    st.write(meaning)

    st.subheader("Related Words (Synonyms):")
    if related:
        synonyms = set()
        for syn in related:
            for lemma in syn.lemmas():
                synonyms.add(lemma.name())
        st.write(", ".join(synonyms) if synonyms else "No synonyms found.")
    else:
        st.write("No synonyms found.")
```

- **Output Sections:**



- Word Meaning
- Related Synonyms

6. Usage Instructions

Setup Instructions:

1. **Install dependencies:**
 - `pip install streamlit nltk textblob`
2. **Run the app:**
 - `streamlit run mlproject.py`
3. **Interact with the App:**
 - Enter a word in the input field.
 - The app displays:
 - The first available definition from WordNet.
 - Synonyms derived from synsets.

7. Conclusion

This app provides a lightweight and effective way to retrieve definitions and synonyms of English words. It serves as a useful educational and linguistic reference.