Generative AI and its Applications

Unit - 1 Project

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Problem Statement: **Language Translation Assistant**

Goal: Simple tool to translate User Manuals from English to French/Spanish.

Abstract: This project implements a Language Translation Assistant using Hugging Face's Transformers library. The system translates English text into French and Spanish using pretrained neural machine translation models. By leveraging the pipelines, the tool provides accurate and fluent translations without requiring model training or fine-tuning. The project demonstrates the practical use of pretrained transformer models for real-world language translation tasks, including both predefined inputs and interactive user-driven translation.

Documentation:

This project shows that language translation can be done automatically using pretrained transformer models available through the Hugging Face library. Instead of translating text word by word, these models understand the meaning and context of a sentence and generate a proper translation in another language.

The project uses Hugging Face's pipeline() function, which makes it easy to load and use translation models without training them from scratch. Two separate pipelines were created: one for English to French translation and another for English to Spanish translation. It includes hardcoded English sentences to show how the translation works, as well as a user-input section where the user can choose the target language and enter their own text. The program runs in a loop so multiple sentences can be translated until the user decides to exit.

Output:

Hardcoded input

```python
text = "This user manual explains how to install the software safely."

result_fr = translator_fr(text)
print("French:", result_fr[0]["translation_text"])

result_es = translator_es(text)
print("Spanish:", result_es[0]["translation_text"])
```

```
French: Ce manuel d'utilisation explique comment installer le logiciel en toute sécurité.
Spanish: Este manual de usuario explica cómo instalar el software de forma segura.
```

```python
print("-- Language Translation Assistant --")
print("Type 'quit()' anytime to stop\n")

while True:
    choice = input("Choose language (1 for French / 2 for Spanish): ").strip()

    if choice.lower() == "quit()":
        print("Exiting translator. Bye ...")
        break

    if choice not in ["1", "2"]:
        print("Invalid choice. Please enter 1 or 2.\n")
        continue

    text = input("Enter English text: ")

    if text.strip().lower() == "quit()":
        print("Exiting translator. Bye ...")
        break

    if text.strip() == "":
        print("Please enter some text.\n")
        continue

    if choice == "1":
        result = translator_fr(text)
        print("French Translation:", result[0]["translation_text"], "\n")

    elif choice == "2":
        result = translator_es(text)
        print("Spanish Translation:", result[0]["translation_text"], "\n")
```

```
-- Language Translation Assistant --
Type 'quit()' anytime to stop

Choose language (1 for French / 2 for Spanish):  1
Enter English text:  Regular maintenance helps improve performance and security.
French Translation: La maintenance régulière contribue à améliorer les performances et la sécurité.

Choose language (1 for French / 2 for Spanish):  4
Invalid choice. Please enter 1 or 2.

Choose language (1 for French / 2 for Spanish):  2
Enter English text:  Thirty-three thousand six hundred.
Spanish Translation: Treinta y tres mil seiscientos.

Choose language (1 for French / 2 for Spanish):  quit()
Exiting translator. Bye ...
```