SensAI – Multilingual AI Translator

1. Introduction

SensAI breaks down language barriers through cutting-edge Generative AI technology. This innovative multilingual translation tool enables seamless communication across English, Japanese, Spanish, Tamil, Chinese, and Korean languages.

Powered by the Mistral AI API, SensAI delivers translations that are accurate, natural-sounding, and sensitive to context. It skillfully preserves the original meaning while adapting to different levels of formality. With its user-friendly Gradio interface, SensAI makes instant language translation accessible to everyone, regardless of technical expertise.

2. What's Included in this Submission?

2.1 SensAI's System Prompt

"You are SensAI, a professional multilingual translator fluent in English, Japanese, Spanish, Tamil, Chinese, and Korean.

Translate accurately, clearly, and naturally while maintaining the requested tone (formal or informal).

Only provide the translated text without additional explanations."

2.2 Key Learnings & Observations

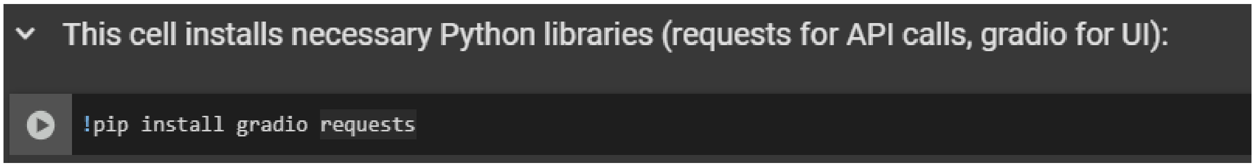
1. **Prompt Engineering Excellence**
   Fine-tuning our prompts dramatically improved translation quality. By instructing the system to "only provide the translation," we eliminated unnecessary explanations. Explicitly requesting formal or informal tones ensured translations matched user expectations. Positioning the AI as a professional translator significantly enhanced the accuracy of complex sentences.

2. **API Integration & Resilience**
   We implemented structured API calls to Mistral AI using requests.post() methodology. Our robust error-handling system provided users with informative messages rather than system crashes when API limits were reached. Strategic token management optimized both response times and API usage efficiency.

3. **Navigating Cultural Linguistic Nuances**
   Languages with distinct politeness structures like Japanese and Korean required specialized prompt instructions. Early versions defaulted to neutral tones, but refined prompts achieved clearer formal/informal differentiation. Spanish and Tamil translations improved through enhanced contextual prompting techniques.

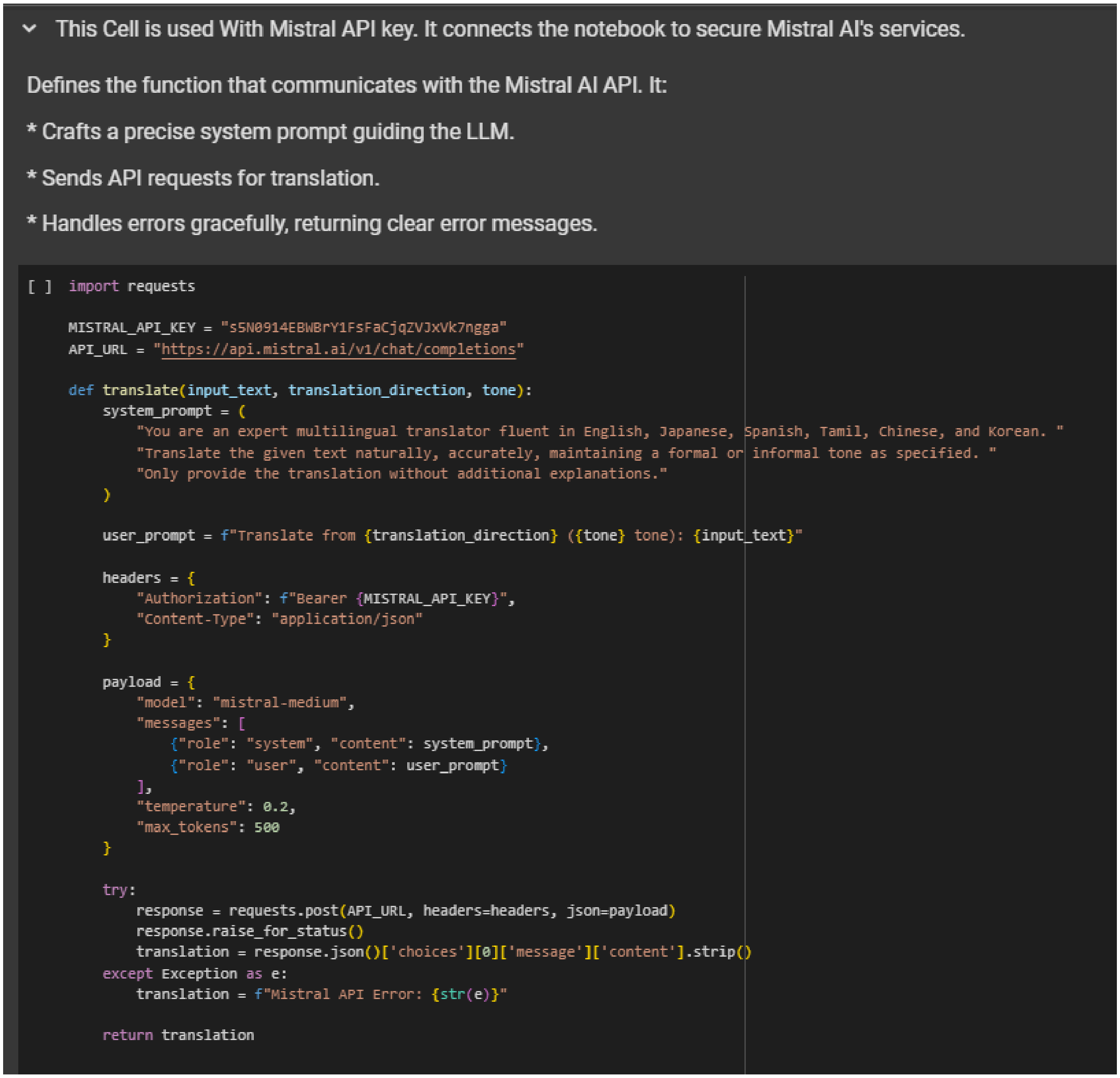
4. **Interface Design Optimization**
   The Gradio interface was streamlined with language selection dropdowns that simplified the user experience. Tone selection via radio buttons provided an intuitive way to toggle between formal and informal styles. Gradio's real-time preview capabilities significantly accelerated our debugging and improvement processes.

3. Output



This cell installs necessary Python libraries (requests for API calls, gradio for UI):

```
!pip install gradio requests
```



This Cell is used With Mistral API key. It connects the notebook to secure Mistral AI's services.

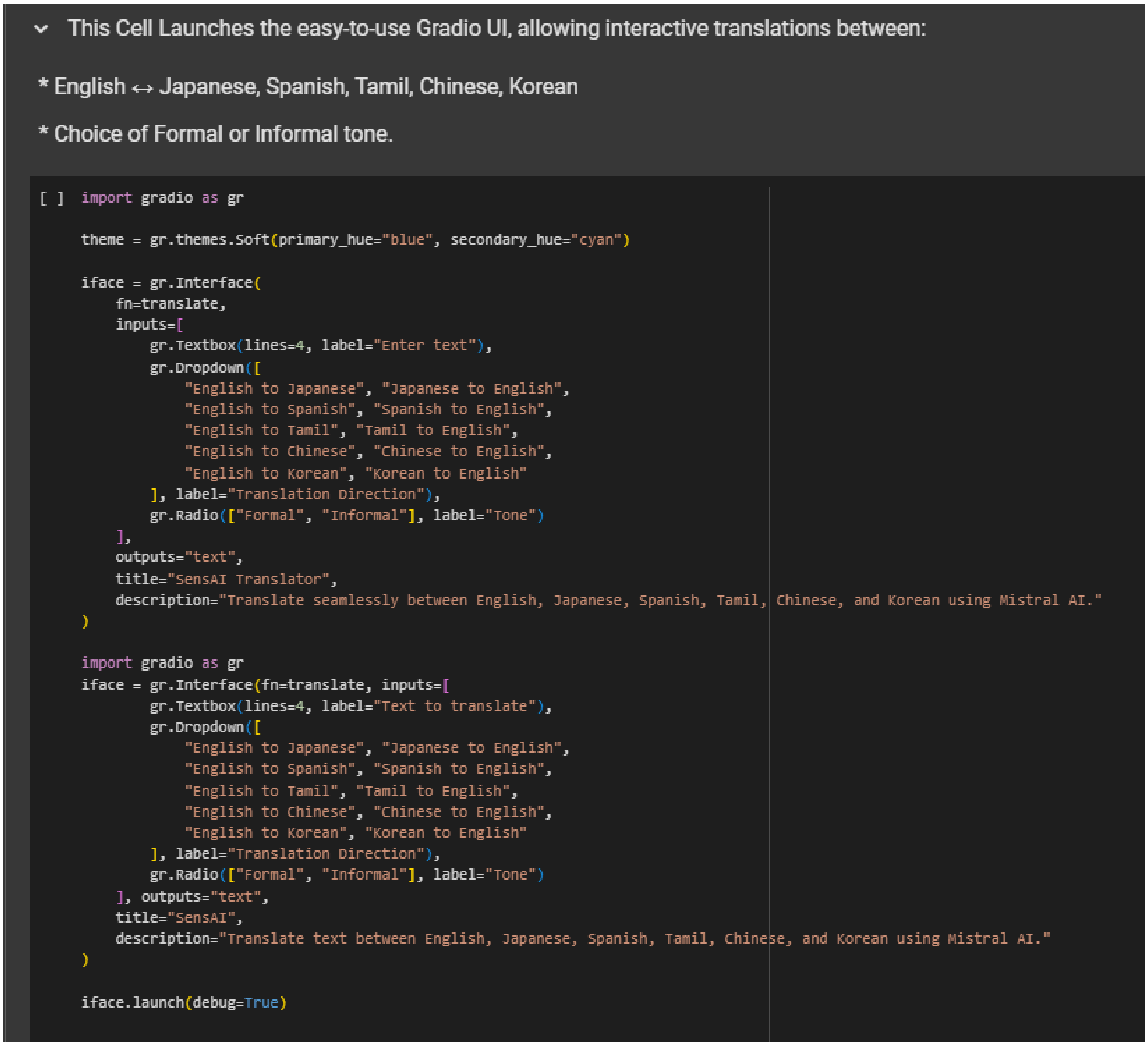
Defines the function that communicates with the Mistral AI API. It:

* Crafts a precise system prompt guiding the LLM.

* Sends API requests for translation.

* Handles errors gracefully, returning clear error messages.

```
[ ]  import requests

     MISTRAL_API_KEY = "s5N0914EBWBrY1FsFaCjqZVJxVk7ngga"
     API_URL = "https://api.mistral.ai/v1/chat/completions"

     def translate(input_text, translation_direction, tone):
         system_prompt = (
             "You are an expert multilingual translator fluent in English, Japanese, Spanish, Tamil, Chinese, and Korean. "
             "Translate the given text naturally, accurately, maintaining a formal or informal tone as specified. "
             "Only provide the translation without additional explanations."
         )

         user_prompt = f"Translate from {translation_direction} ({tone} tone): {input_text}"

         headers = {
             "Authorization": f"Bearer {MISTRAL_API_KEY}",
             "Content-Type": "application/json"
         }

         payload = {
             "model": "mistral-medium",
             "messages": [
                 {"role": "system", "content": system_prompt},
                 {"role": "user", "content": user_prompt}
             ],
             "temperature": 0.2,
             "max_tokens": 500
         }

         try:
             response = requests.post(API_URL, headers=headers, json=payload)
             response.raise_for_status()
             translation = response.json()['choices'][0]['message']['content'].strip()
         except Exception as e:
             translation = f"Mistral API Error: {str(e)}"

         return translation
```

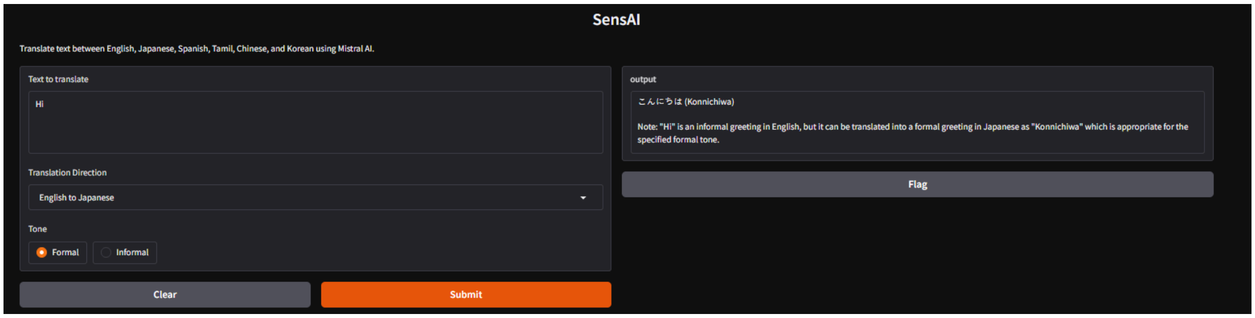


This Cell Launches the easy-to-use Gradio UI, allowing interactive translations between:

* English ↔ Japanese, Spanish, Tamil, Chinese, Korean

* Choice of Formal or Informal tone.

```
import gradio as gr

theme = gr.themes.Soft(primary_hue="blue", secondary_hue="cyan")

iface = gr.Interface(
    fn=translate,
    inputs=[
        gr.Textbox(lines=4, label="Enter text"),
        gr.Dropdown([
            "English to Japanese", "Japanese to English",
            "English to Spanish", "Spanish to English",
            "English to Tamil", "Tamil to English",
            "English to Chinese", "Chinese to English",
            "English to Korean", "Korean to English"
        ], label="Translation Direction"),
        gr.Radio(["Formal", "Informal"], label="Tone")
    ],
    outputs="text",
    title="SensAI Translator",
    description="Translate seamlessly between English, Japanese, Spanish, Tamil, Chinese, and Korean using Mistral AI."
)

import gradio as gr
iface = gr.Interface(fn=translate, inputs=[
        gr.Textbox(lines=4, label="Text to translate"),
        gr.Dropdown([
            "English to Japanese", "Japanese to English",
            "English to Spanish", "Spanish to English",
            "English to Tamil", "Tamil to English",
            "English to Chinese", "Chinese to English",
            "English to Korean", "Korean to English"
        ], label="Translation Direction"),
        gr.Radio(["Formal", "Informal"], label="Tone")
    ], outputs="text",
    title="SensAI",
    description="Translate text between English, Japanese, Spanish, Tamil, Chinese, and Korean using Mistral AI."
)

iface.launch(debug=True)
```



SensAI

Translate text between English, Japanese, Spanish, Tamil, Chinese, and Korean using Mistral AI.

Text to translate

Hi

Translation Direction

English to Japanese

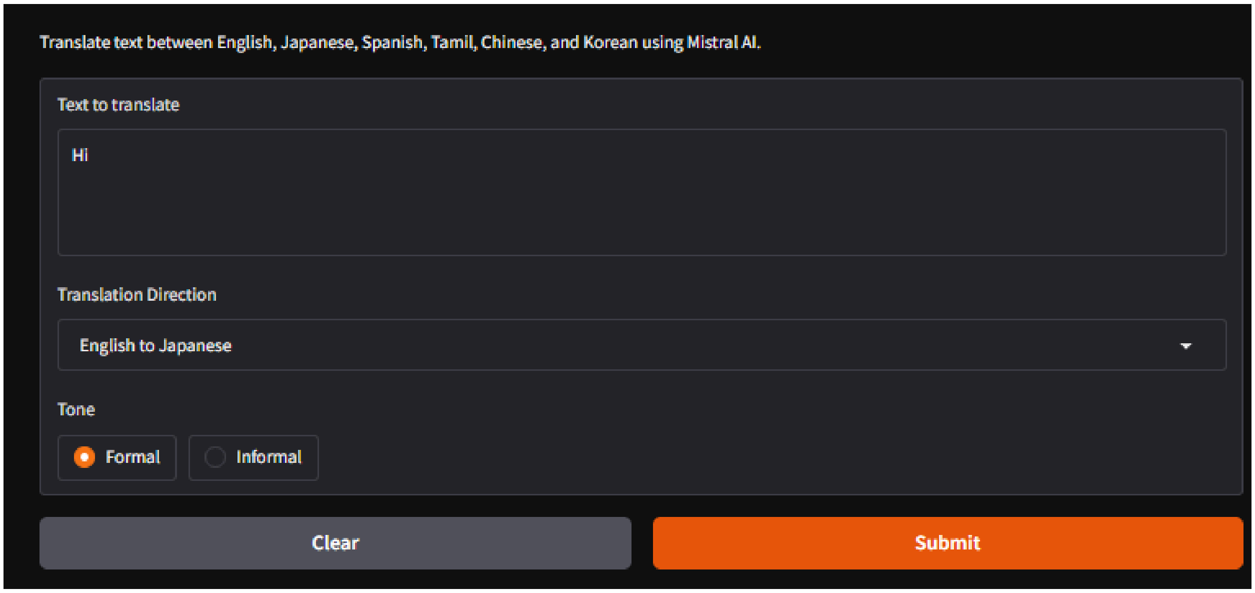
Tone

● Formal ○ Informal

output

こんにちは (Konnichiwa)

Note: "Hi" is an informal greeting in English, but it can be translated into a formal greeting in Japanese as "Konnichiwa" which is appropriate for the specified formal tone.



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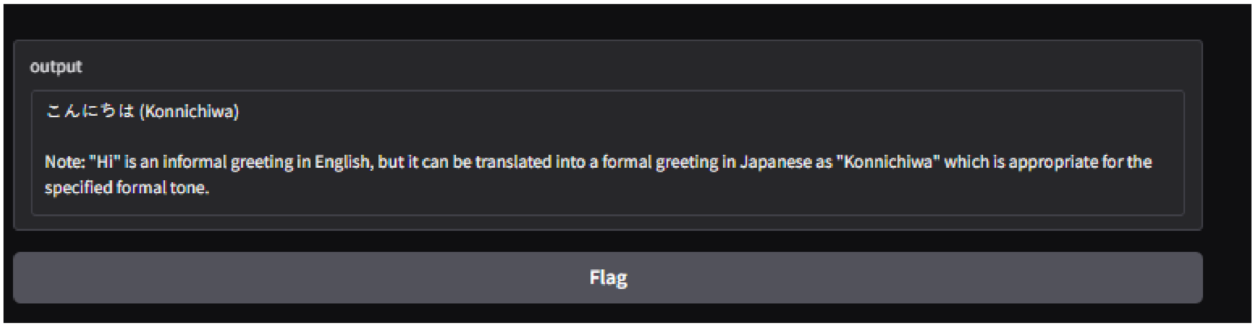


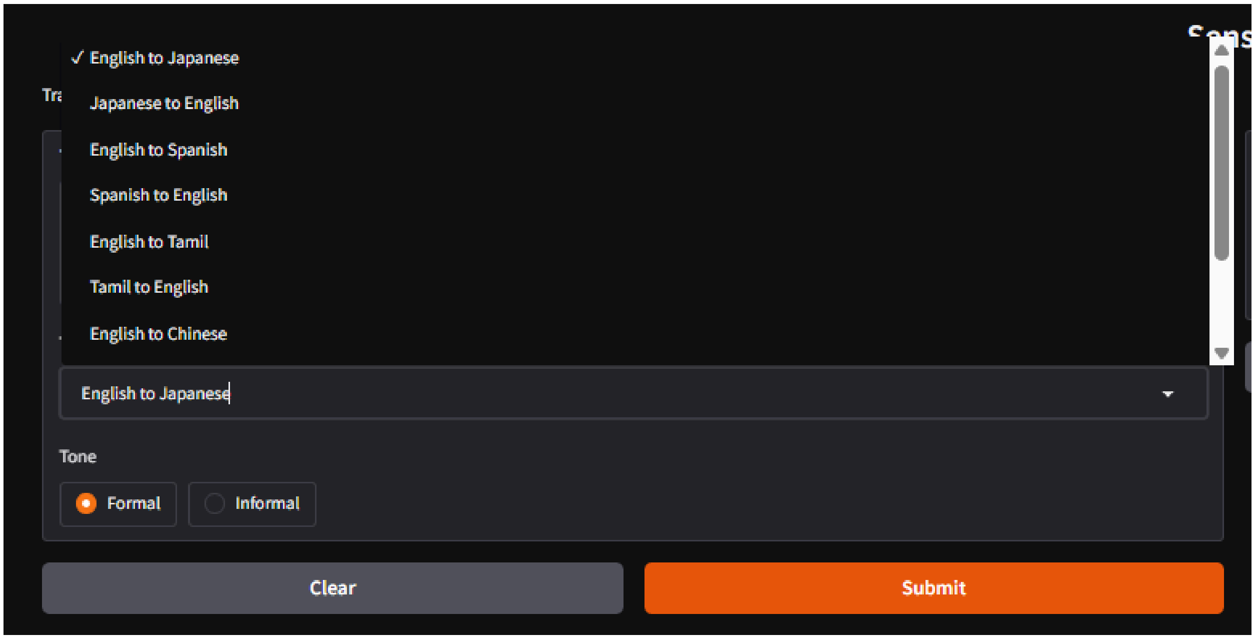
output

こんにちは (Konnichiwa)

Note: "Hi" is an informal greeting in English, but it can be translated into a formal greeting in Japanese as "Konnichiwa" which is appropriate for the specified formal tone.

The dropdown has translation to multiple languages English to the desired language and vice versa.

The Languages that are chosen are - Japanese, Spanish, Tamil, Chinese.



English to Japanese

Tone

● Formal ○ Informal