Rainbow Formation AI Explanation

1. Project Overview

This project is an **interactive AI-powered web app** built using **Gradio** and **Hugging Face Transformers** that generates explanations of how rainbows are formed.
It uses the **GPT-2** model for text generation and presents the output in a styled web interface.

2. Features

- **Text Generation with GPT-2**: Uses the Hugging Face Transformers library to generate a natural language explanation.
- **Custom-Styled Gradio Interface**: Beautiful UI with custom CSS for buttons and output areas.
- **One-Click Interaction**: Just click the button to get an AI-generated explanation.
- **In-Browser Launch**: Opens directly in your browser with no manual setup required.

3. How It Works

a. **Model Loading**
   i. The `pipeline` function from Hugging Face loads the `gpt2` model for text generation.

b. **Function Definition**
   i. `explain_rainbows()` sends a fixed prompt ("Explain how rainbows are formed") to the model and returns the generated explanation.

c. **Custom CSS**
   i. CSS styles define button colors, hover effects, and output box formatting.

d. **Gradio UI**
   i. Markdown headings and descriptions for the app.
   ii. A **Textbox** displays the AI explanation.
   iii. A **Button** triggers the `explain_rainbows` function.

e. **Launch**
   i. The Gradio app launches in the browser with `demo.launch(inbrowser=True, share=False).`

Install dependencies:

```bash
pip install transformers
pip install gradio
```

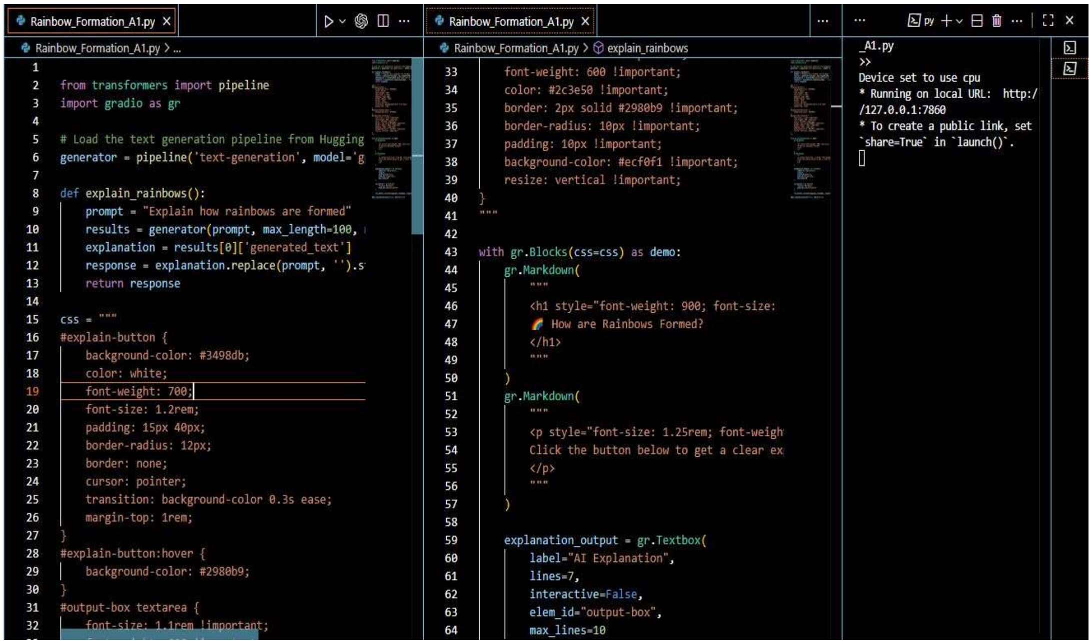
4. Usage Instructions

```bash
python Rainbow_Formation_A1.py
```

The application will:

- Start a local Gradio server.
- Automatically open in your browser.
- Let you click **"Explain Rainbows"** to generate an explanation.

5. Code Explanation



Rainbow_Formation_A1.py
Rainbow_Formation_A1.py > ...
Rainbow_Formation_A1.py
Rainbow_Formation_A1.py > explain_rainbows
py

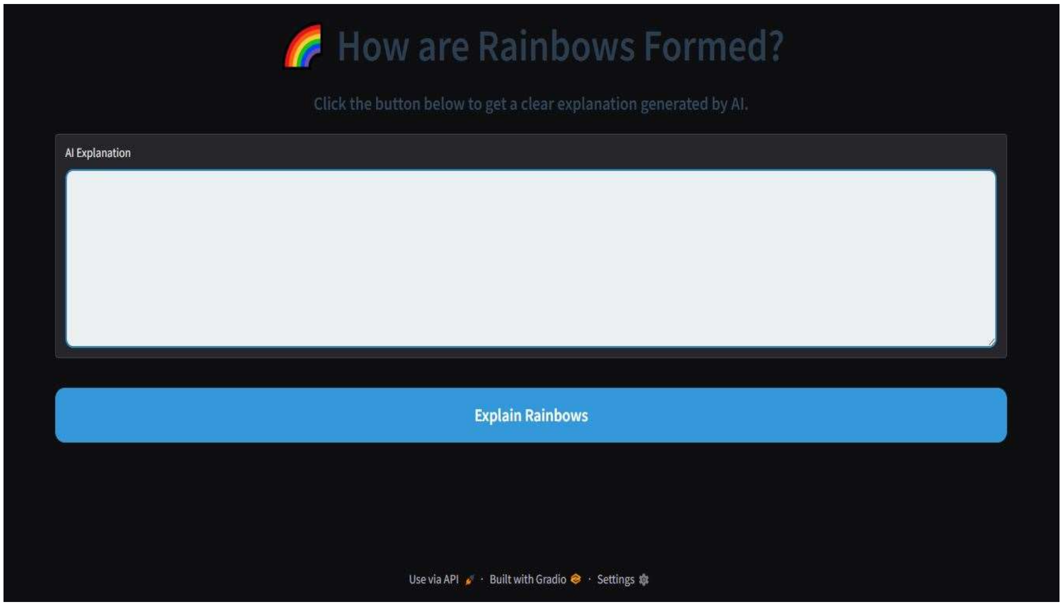
```python

from transformers import pipeline
import gradio as gr

# Load the text generation pipeline from Hugging
generator = pipeline('text-generation', model='g

def explain_rainbows():
    prompt = "Explain how rainbows are formed"
    results = generator(prompt, max_length=100, 
    explanation = results[0]['generated_text']
    response = explanation.replace(prompt, '').s
    return response

css = """
#explain-button {
    background-color: #3498db;
    color: white;
    font-weight: 700;
    font-size: 1.2rem;
    padding: 15px 40px;
    border-radius: 12px;
    border: none;
    cursor: pointer;
    transition: background-color 0.3s ease;
    margin-top: 1rem;
}
#explain-button:hover {
    background-color: #2980b9;
}
#output-box textarea {
    font-size: 1.1rem !important;
```

```python
    font-weight: 600 !important;
    color: #2c3e50 !important;
    border: 2px solid #2980b9 !important;
    border-radius: 10px !important;
    padding: 10px !important;
    background-color: #ecf0f1 !important;
    resize: vertical !important;
}
"""


with gr.Blocks(css=css) as demo:
    gr.Markdown(
        """
        <h1 style="font-weight: 900; font-size:
        🌈 How are Rainbows Formed?
        </h1>
        """
    )
    gr.Markdown(
        """
        <p style="font-size: 1.25rem; font-weigh
        Click the button below to get a clear ex
        </p>
        """
    )

    explanation_output = gr.Textbox(
        label="AI Explanation",
        lines=7,
        interactive=False,
        elem_id="output-box",
        max_lines=10
```

```
_A1.py
>>
Device set to use cpu
* Running on local URL:  http:/
/127.0.0.1:7860
* To create a public link, set
`share=True` in `launch()`.
```

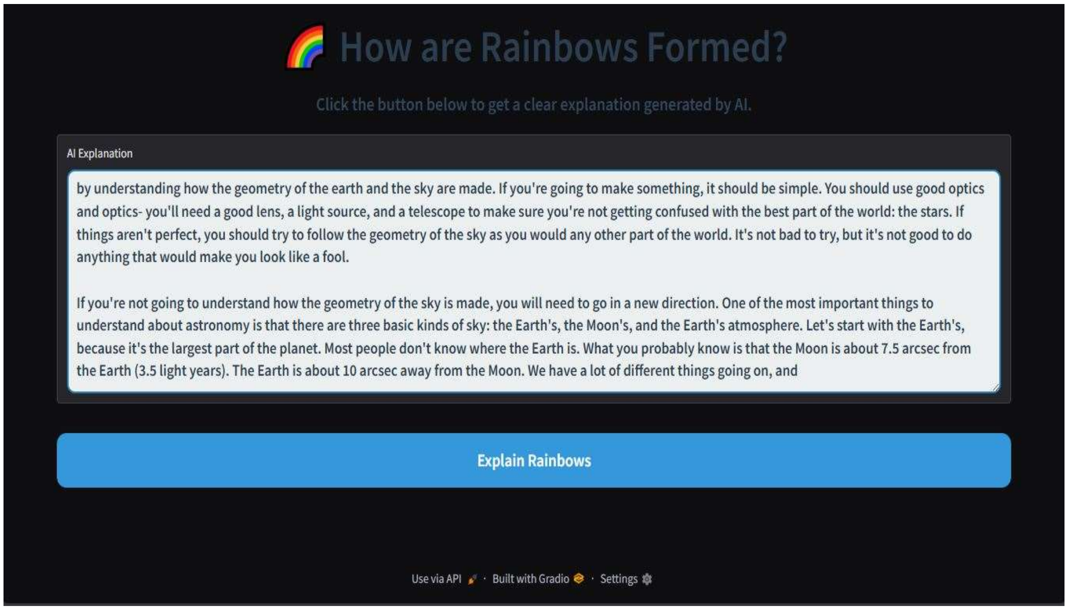
Fig1: Input Snapshot

6. Output Snapshots


🌈 How are Rainbows Formed?

Click the button below to get a clear explanation generated by AI.

Fig2: Output Snapshot 1


🌈 How are Rainbows Formed?

Click the button below to get a clear explanation generated by AI.

by understanding how the geometry of the earth and the sky are made. If you're going to make something, it should be simple. You should use good optics and optics- you'll need a good lens, a light source, and a telescope to make sure you're not getting confused with the best part of the world: the stars. If things aren't perfect, you should try to follow the geometry of the sky as you would any other part of the world. It's not bad to try, but it's not good to do anything that would make you look like a fool.

If you're not going to understand how the geometry of the sky is made, you will need to go in a new direction. One of the most important things to understand about astronomy is that there are three basic kinds of sky: the Earth's, the Moon's, and the Earth's atmosphere. Let's start with the Earth's, because it's the largest part of the planet. Most people don't know where the Earth is. What you probably know is that the Moon is about 7.5 arcsec from the Earth (3.5 light years). The Earth is about 10 arcsec away from the Moon. We have a lot of different things going on, and

Fig3: Output Snapshot 2