

Aim:

To compare the responses of two open-source language models, **GPT-Neo** and **GPT-2**, to a given question, and analyze how different models generate text and handle natural language queries.

Procedure:

1. **Install Required Libraries:**

Use the command below to install the necessary Python libraries:

```
bash
```

```
Copy code
```

```
pip install transformers torch
```

2. **Load Models:**

- Load two pre-trained language models from Hugging Face:
 - **GPT-Neo** (EleutherAI/gpt-neo-1.3B).
 - **GPT-2** (gpt2).

3. **Define Functions:**

- Define two functions to generate text from both models.
 - **GPT-Neo Function:** Generates text from the GPT-Neo model.
 - **GPT-2 Function:** Generates text from the GPT-2 model.

4. **Generate Answers:**

- Input the question “What are the benefits of renewable energy?” to both models and generate their responses.

5. **Compare Answers:**

- Compare the generated answers from both models to see if they match or differ.
- Print the responses and a summary indicating whether the answers are the same or different.

6. **Execute the Code:**

- Run the code to generate and compare answers.

GPT-Neo:

Program:

```
import difflib
```

```
def compare_answers(model1_output, model2_output): # Convert outputs to strings
```

```
    str1 = ".join(map(str, model1_output))    str2 = ".join(map(str, model2_output))    # Use  
    SequenceMatcher from difflib library
```

```
    sm = difflib.SequenceMatcher(None, str1, str2) # Calculate the ratio of matching blocks
```

```
    similarity_ratio = sm.ratio()    return similarity_ratio
```

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Example usage:

```
model1_response = ["Hello", "world!", 42]
```

```
model2_response = ["Hola", "mundo!", 43] similarity_score = compare_answers(model1_response,  
model2_response)
```

OUTPUT:

```
```Similarity Score: 0.4  
```So the similarity score between the outputs of these two models is approximately 4  
0%.
```

GPT-2

```
import difflib
```

```
def compare_answers(model1_output, model2_output):
```

```
    # Convert outputs to strings
```

```
    str1 = ".join(map(str, model1_output))
```

```
    str2 = ".join(map(str, model2_output))
```

```
    # Use SequenceMatcher from difflib library
```

```
    sm = difflib.SequenceMatcher(None, str1, str2)
```

```
    # Calculate the ratio of matching blocks
```

```
    similarity_ratio = sm.ratio()
```

```
    return similarity_ratio
```

Example usage:

```
model1_response = ["Hello", "world!", 42]
```

```
model2_response = ["Hola", "mundo!", 43]
```

```
similarity_score = compare_answers(model1_response, model2_response)
```

```
print(similarity_score)
```

OUTPUT:

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The similarity score between the two model responses is: 0.4