semantic_role_labeling2

March 28, 2024

1 Python Script for Semantic Role Labeling (SRL)

1.1 Step 1: Import necessary libraries

[1]:
```
try:
  import openai
except:
  !pip install openai
  import openai
```

[2]:
```
from openai import OpenAI
```

1.2 Step 2: Initialize the GPT API client

[3]:
```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call
drive.mount("/content/drive", force_remount=True).
```

[4]:
```
f = open("/content/drive/MyDrive/NLP/api_key.txt", "r")
API_KEY=f.readline()
f.close()
```

[5]:
```
import os
os.environ['OPENAI_API_KEY'] =API_KEY
openai.api_key = os.getenv("OPENAI_API_KEY")
```

1.3 3. Semantic Interpretation tool to perform Semantic Role Labeling based on the input.

[6]:
```
# # Use the GPT API for next Semantic Role Labeling

def perform_srl(sentences):

        client = OpenAI()
        responses =[]
```

```
        for sentence in sentences:
          response = client.chat.completions.create(
            model="gpt-3.5-turbo-0125",
            messages=[
              {
                "role": "system",
                # "content": "You will Provide Semantic Role Labeling, and your␣
↪task is to receive a sentence and provide Semantic Role Labeling for each␣
↪word in the sentence"
                "content": "You will Provide Semantic Role Labeling, and your␣
↪task is to provide Semantic Role Labeling for rach word such as V, ARG0,␣
↪ARG1, ARGM-TMP,.. for each work in the sentence"

              },
              {
                "role": "user",
                "content": sentence
              }
            ],

            # max_tokens=256,

          )
          responses.append(response)

        return responses
```

1.4 Step 4: Initilize Sentences.

[13]:
```
def main():

    # Sample sentences for testing
    sample_sentences = [
        "Sahara ate an apple.",
        "Wessley chased the dog.",
        "Angel gave Creston a cup of coffee for his birthday."
        "Creston went to beach on Sunday night",
        "Wessley watched the rocket launch in January.",
        "Angel watched a funny movie that made him laugh.",
        "Summer is coming up, we cannot wait for beach days",
        "The white and Pink Cherry Blossoms looked really beautiful in Japan's␣
↪Spring time.",
        "I miss running so much!",
        "I cannot think of anymore sentences but this was fun."
    ]
```

```
    srl_result = perform_srl(sample_sentences)

    # Perform Semantic Role Labeling for each sentence
    for idx, sentence in enumerate(sample_sentences, start=0):

        print(f"Sentence {idx+1}: {sentence}")
        print("Semantic Role Labels:")
        print(srl_result[idx].choices[0].message.content)
        print("\n")
```

[14]:
```
if __name__ == "__main__":
    main()
```

```
Sentence 1: Sahara ate an apple.
Semantic Role Labels:
Sahara: ARG0 (Agent)
ate: V (Verb)
an apple: ARG1 (Patient)


Sentence 2: Wessley chased the dog.
Semantic Role Labels:
Wessley (ARG0) chased (V) the dog (ARG1).


Sentence 3: Angel gave Creston a cup of coffee for his birthday.Creston went to
beach on Sunday night
Semantic Role Labels:
1. Angel gave Creston a cup of coffee for his birthday.
   - Angel (ARG0) gave (V) Creston (ARG1) a cup of coffee (ARG2) for his
birthday (ARGM-TMP).

2. Creston went to the beach on Sunday night.
   - Creston (ARG0) went (V) to the beach (ARGM-DIR) on Sunday night (ARGM-TMP).


Sentence 4: Wessley watched the rocket launch in January.
Semantic Role Labels:
Wessley (ARG0) watched (V) the rocket (ARG1) launch (V) in January (ARGM-TMP).


Sentence 5: Angel watched a funny movie that made him laugh.
Semantic Role Labels:
Angel - ARG0
watched - V
a funny movie - ARG1
that - None
```

```
made - V
him - ARG0
laugh - ARG1


Sentence 6: Summer is coming up, we cannot wait for beach days
Semantic Role Labels:
Summer[V] is[ARG0] coming up[ARGM-TMP], we[ARG0] cannot[ARG0] wait for[ARG1]
beach[V] days[ARG1]


Sentence 7: The white and Pink Cherry Blossoms looked really beautiful in
Japan's Spring time.
Semantic Role Labels:
1. The (ARG0)
2. white and Pink Cherry Blossoms (ARG1)
3. looked (V)
4. really (ARGM-MNR)
5. beautiful (ARGM-ADV)
6. in Japan's Spring time (ARGM-TMP)


Sentence 8: I miss running so much!
Semantic Role Labels:
I(V) miss(ARG0) running(ARG1) so much(ARGM-DIR)!(ARGM-PNC)


Sentence 9: I cannot think of anymore sentences but this was fun.
Semantic Role Labels:
1. I [cannot] V
2. I [think] V of anymore sentences
   - ARG0: I
   - V: think
   - ARG1: of anymore sentences
3. I [was] V fun
   - ARG0: I
   - V: was
   - ARG1: fun
```

[17]:
```
!apt-get install texlive texlive-xetex texlive-latex-extra pandoc
!pip install pypandoc
```

```
Reading package lists… Done
Building dependency tree… Done
```

```
Reading state information… Done
pandoc is already the newest version (2.9.2.1-3ubuntu2).
texlive is already the newest version (2021.20220204-1).
texlive-latex-extra is already the newest version (2021.20220204-1).
texlive-xetex is already the newest version (2021.20220204-1).
0 upgraded, 0 newly installed, 0 to remove and 39 not upgraded.
Requirement already satisfied: pypandoc in /usr/local/lib/python3.10/dist-
packages (1.13)
```

[15]:
```
import os
os.chdir("/content/drive/MyDrive/")
```

[16]:
```
!jupyter nbconvert --to PDF "semantic_role_labeling.ipynb" /content/drive/
 ↪MyDrive/semantic_role_labeling.ipynb
```

```
[NbConvertApp] Converting notebook semantic_role_labeling.ipynb to PDF
[NbConvertApp] Writing 29416 bytes to notebook.tex
[NbConvertApp] Building PDF
[NbConvertApp] Running xelatex 3 times: ['xelatex', 'notebook.tex', '-quiet']
[NbConvertApp] Running bibtex 1 time: ['bibtex', 'notebook']
[NbConvertApp] WARNING | bibtex had problems, most likely because there were no
citations
[NbConvertApp] PDF successfully created
[NbConvertApp] Writing 37446 bytes to semantic_role_labeling.pdf
[NbConvertApp] Converting notebook
/content/drive/MyDrive/semantic_role_labeling.ipynb to PDF
[NbConvertApp] Writing 29416 bytes to notebook.tex
[NbConvertApp] Building PDF
[NbConvertApp] Running xelatex 3 times: ['xelatex', 'notebook.tex', '-quiet']
[NbConvertApp] Running bibtex 1 time: ['bibtex', 'notebook']
[NbConvertApp] WARNING | bibtex had problems, most likely because there were no
citations
[NbConvertApp] PDF successfully created
[NbConvertApp] Writing 37444 bytes to
/content/drive/MyDrive/semantic_role_labeling.pdf
```