Practicum AI

This exercise adapted from Tunstall et al. (2022) *Natural Language Processing with Transformers* from O'Reilly Media

Exercise 4.00 (Teacher)

In [ ]:
```
!pip install transformers
```

In [ ]:
```
!pip install datasets
```

In [1]:
```python
# Import everything from the utils library and then execute setup_chapter() - defined in the utils.py file.
from utils import *
setup_chapter()
```

```
Using transformers v4.16.2
Using datasets v1.18.3
```

A Tour of Transformer Applications

In [14]:
```python
text = """Dear Amazon, last week I ordered an Optimus Prime action figure \
from your online store in Germany. Unfortunately, when I opened the package, \
I discovered to my horror that I had been sent an action figure of Megatron \
instead! As a lifelong enemy of the Decepticons, I hope you can understand my \
dilemma. To resolve the issue, I demand an exchange of Megatron for the \
Optimus Prime figure I ordered. Enclosed are copies of my records concerning \
this purchase. I expect to hear from you soon. Sincerely, Bumblebee."""
```

Text Classification

In [15]:
```python
from transformers import pipeline

classifier = pipeline("text-classification")
```

In [16]:
```python
import pandas as pd

outputs = classifier(text)
pd.DataFrame(outputs)
```

Out[16]:

	label	score
0	NEGATIVE	0.901546

Named Entity Recognition

In [17]:
```python
ner_tagger = pipeline("ner", aggregation_strategy = "simple")
outputs = ner_tagger(text)
pd.DataFrame(outputs)
```

Out[17]:

	entity_group	score	word	start	end
0	ORG	0.879010	Amazon	5	11
1	MISC	0.990859	Optimus Prime	36	49
2	LOC	0.999755	Germany	90	97
3	MISC	0.556568	Mega	208	212
4	PER	0.590257	##tron	212	216
5	ORG	0.669692	Decept	253	259
6	MISC	0.498350	##icons	259	264
7	MISC	0.775361	Megatron	350	358
8	MISC	0.987854	Optimus Prime	367	380
9	PER	0.812096	Bumblebee	502	511

Question Answering

In [ ]:
```python
reader = pipeline("question-answering")
question = "What does the customer want?"
outputs = reader(question = question, context = text)
pd.DataFrame([outputs])
```

Out[ ]:

	score	start	end	answer
0	0.631291	335	358	an exchange of Megatron

Summarization

In [ ]:
```python
summarizer = pipeline("summarization")
outputs = summarizer(text, max_length = 45, clean_up_tokenization_spaces = True)
print(outputs[0]['summary_text'])
```

 Bumblebee ordered an Optimus Prime action figure from your online store in
Germany. Unfortunately, when I opened the package, I discovered to my horror
that I had been sent an action figure of Megatron instead.

Translation

In [ ]:
```python
translator = pipeline("translation_en_to_de",
                      model = "Helsinki-NLP/opus-mt-en-de")
outputs = translator(text, clean_up_tokenization_spaces = True, min_length = 100)
print(outputs[0]['translation_text'])
```

Sehr geehrter Amazon, letzte Woche habe ich eine Optimus Prime Action Figur aus
Ihrem Online-Shop in Deutschland bestellt. Leider, als ich das Paket öffnete,
entdeckte ich zu meinem Entsetzen, dass ich stattdessen eine Action Figur von
Megatron geschickt worden war! Als lebenslanger Feind der Decepticons, Ich
hoffe, Sie können mein Dilemma verstehen. Um das Problem zu lösen, Ich fordere
einen Austausch von Megatron für die Optimus Prime Figur habe ich bestellt.
Anbei sind Kopien meiner Aufzeichnungen über diesen Kauf. Ich erwarte, bald von
Ihnen zu hören. Aufrichtig, Bumblebee.

Text Generation

In [ ]:
```python
from transformers import set_seed
set_seed(42) # Set the seed to get reproducible results
```

```
In [ ]:  generator = pipeline("text-generation")
         response = "Dear Bumblebee, I am sorry to hear that your order was mixed up."
         prompt = text + "\n\nCustomer service response:\n" + response
         outputs = generator(prompt, max_length = 200)
         print(outputs[0]['generated_text'])
```

Dear Amazon, last week I ordered an Optimus Prime action figure from your online
store in Germany. Unfortunately, when I opened the package, I discovered to my
horror that I had been sent an action figure of Megatron instead! As a lifelong
enemy of the Decepticons, I hope you can understand my dilemma. To resolve the
issue, I demand an exchange of Megatron for the Optimus Prime figure I ordered.
Enclosed are copies of my records concerning this purchase. I expect to hear
from you soon. Sincerely, Bumblebee.

Customer service response:
Dear Bumblebee, I am sorry to hear that your order was mixed up. The order was
completely mislabeled, which is very common in our online store, but I can
appreciate it because it was my understanding from this site and our customer
service of the previous day that your order was not made correct in our mind and
that we are in a process of resolving this matter. We can assure you that your
order