

Language modeling

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In [1]: import transformers
transformers.utils.logging.set_verbosity_error()
```

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In [2]: from transformers import AutoModelForCausalLM, AutoTokenizer

model = AutoModelForCausalLM.from_pretrained('gpt2')
tokenizer = AutoTokenizer.from_pretrained('gpt2')

print(sum(p.numel() for p in model.parameters()))
```

124439808

```
In [3]: def generate(prompt, num_outputs=1, exclude_prompt=False, **kwargs):
        x = tokenizer(prompt, return_tensors='pt').input_ids

        for i in range(num_outputs):
            if i > 0:
                print('-----')

            y = model.generate(x, **kwargs)
            print(tokenizer.batch_decode(y)[0][len(prompt) if exclude_prompt else 0:])
```

```
In [4]: generate('Once upon a time in Bologna', max_length=50)
```

2022-12-16 05:48:02.934554: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions in performance-critical operations: AVX2 FMA
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

Once upon a time in Bologna, the city's mayor, the mayor of the city of Bologna, the mayor of the city of Bologna, the mayor of the city of Bologna, the mayor of the city of

```
In [5]: transformers.set_seed(1)
generate('Once upon a time in Bologna', max_length=100, do_sample=True,
        top_p=0.9, num_outputs=3)
```

Once upon a time in Bologna, a student called Ola took the form of an American, a young man, who took up arms against the government over the state's role in his country's problems. He demanded that the government address his plight in a speech. The president responded with an action that the student and the American government could not have taken lightly, but he insisted on it.

The student then used an old Italian poem that he had seen in a supermarket, which he

Once upon a time in Bologna they asked me to bring a copy of a book and then one of them said that they were working on a project. So the next day the staff of Bologna opened the book and the staff asked me to do the work that I did. I wrote the book but the next day it was a lot of work. At this point, I started thinking about what I could do as a writer.

What is your passion, as a poet?

Once upon a time in Bologna, the city's police force, under the command of police chief Roberto Giocinto, had made two arrests over a period of seven years.

The first, on Dec. 8, was a drug arrest for carrying an illegal load, which resulted in th

e arrest of a man by the police, identified by his father as a gang leader. The second, on Jan. 9, was a drug arrest for carrying and carrying and carrying and carrying and carrying

In [6]:

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transformers.set_seed(2)
prompt = 'In a shocking finding, scientists discovered a ' \
        'herd of unicorns living in a remote, ' \
        'previously unexplored valley, in the Andes Mountains. '\
        'Even more surprising to the ' \
        'researchers was the fact that the unicorns spoke perfect English.'

generate(prompt, max_length=100, do_sample=True, top_p=0.9,
        num_outputs=3, exclude_prompt=True)
```

The unicorns even spoke an incantation from their mothers when they were young. This indicates that the humans were not born with unicorns. However, the findings were not just shocking to the unicorns' parents. They also raised their offspring with special care.

The study was published in the journal Evolution and Human Behavior.

The study, which was led by scientists from the University of Chile and the University of Washington, analyzed nearly 2,500 wild male and female unicorns, all living in remote regions where the species

The unicorn was found in the region, but as a new species of species, it was not native to Chile. "It is likely that this species was not native to Peru, or Peru as a whole, but it was found in the same valley," said the

In [7]:

```
transformers.set_seed(3)
prompt = '''Midway upon the journey of our life
I found myself within a forest dark,
For the straightforward pathway had been lost'''

generate(prompt, max_length=100, do_sample=True,
        top_p=0.9, exclude_prompt=True)
```

.
I left my senses and the other inhabitants of the forest behind me.
The trees seemed to have been blown from a distance.
The wind had been blowing, which caused me to rise and find my own home.
I did not even know I had found my home.
I had only heard of a few days before my journey had ended.
Even

Generation of reviews

In [8]:

```
training_reviews_with_labels = [
    ("Watched the whole thing: surprisingly good!", 'positive'),
    ("Beautifully, thoughtfully made", 'positive'),
    ("A good end to a good season", 'positive'),
    ("Better than expected", 'positive'),
    ("Amazing achievement!!", 'positive'),
    ("It's fantastic", 'positive'),
    ("Fully prepared to hate this... completely surprised!", 'positive'),
    ("The right direction", 'positive'),
    ("A visual and storytelling masterpiece.", 'positive'),
    ("Definitely should see if you're a fan of the genre", 'positive'),
```

```

("Amazing cinematography, most of the storylines are good", 'positive'),
("A great series you can actually watch with your family.", 'positive'),
("Pretty good start", 'positive'),

("Beautiful to watch, a few interesting characters, storyline is good until it isn't",
("So much potential, but less realization", 'neutral'),
("Missed the mark", 'neutral'),
("Has potential, but also flaws", 'neutral'),
("Amazing looks but lacking a clear Jacksoneque vision", 'neutral'),
("Slow; Slow; Slow", 'neutral'),
("It's fine - as in OK - as in mediocre", 'neutral'),
("Beautiful but", 'neutral'),
("Great CGI but lacks an interesting plot", 'neutral'),

("More boring than logic homework", 'negative'),
("A major disappointment", 'negative'),
("Horrible writing, slow plot, and disrespectful", 'negative'),
("An ok fantasy story that has little to do with Tolkien", 'negative'),
("Boring, even for generic fantasy", 'negative'),
("So many problems", 'negative'),
("What is this, an Anti-FanFic or something? Please read the books!", 'negative'),
("Just bad all around", 'negative'),
("I mourn for what this could have been", 'negative'),
("Short version, skip it. You'll know you did right when you don't hear people talking
("Could have been so much more", 'negative'),
]

```

```

In [9]: labels = ['positive', 'neutral', 'negative']

training_reviews = [review for review, label in training_reviews_with_labels]
training_labels = [label for review, label in training_reviews_with_labels]

```

```

In [10]: import copy
import random

transformers.set_seed(5)
shuffled_training_reviews = copy.copy(training_reviews)
random.shuffle(shuffled_training_reviews)

prompt = '\n'.join(shuffled_training_reviews) + '\n'

```

```

In [11]: print(prompt)

```

```

Amazing achievement!!
I mourn for what this could have been
Amazing looks but lacking a clear Jacksoneque vision
It's fine - as in OK - as in mediocre
Beautiful to watch, a few interesting characters, storyline is good until it isn't
Pretty good start
A good end to a good season
So many problems
Amazing cinematography, most of the storylines are good
Horrible writing, slow plot, and disrespectful
Slow; Slow; Slow
Definitely should see if you're a fan of the genre
Great CGI but lacks an interesting plot
A visual and storytelling masterpiece.
Fully prepared to hate this... completely surprised!
Just bad all around
Missed the mark
A great series you can actually watch with your family.

```

Better than expected
It's fantastic
Beautifully, thoughtfully made
What is this, an Anti-FanFic or something? Please read the books!
The right direction
So much potential, but less realization
Watched the whole thing: surprisingly good!
Could have been so much more
Beautiful but
A major disappointment
Boring, even for generic fantasy
Short version, skip it. You'll know you did right when you don't hear people talking about it.
An ok fantasy story that has little to do with Tolkien
More boring than logic homework
Has potential, but also flaws

In [12]:

```
transformers.set_seed(6)
generate(prompt, max_new_tokens=100, do_sample=True, top_p=0.9,
         num_outputs=2, exclude_prompt=True)
```

There are many, many of the problems of a lot of popular fantasy, but few.
I hope it's something that you watch, because it's so much better than the typical "just watch this" thing. And I hope you won't feel like giving it a read and watching it with your family.
Read the books again. Read the other ones. And watch all the rest for yourself. Because if you like what you see, then go and watch some.
I do like

If you really want it, you can't tell that this is a fanfic. But, if you really want to get into that type of thing, this is one to watch.
There are some great authors who could write an anti-fanfic but then, I don't have to worry about that.
Don't get me wrong: the way this is presented and executed, is very good. I don't care if it looks like a fanfic, I

In [13]:

```
transformers.set_seed(7)
shuffled_positive_training_reviews = copy.copy([
    review for review, label in training_reviews_with_labels
    if label == 'positive'
])
random.shuffle(shuffled_positive_training_reviews)

prompt = '\n'.join(shuffled_positive_training_reviews) + '\n'
```

In [14]:

```
print(prompt)
```

Better than expected
Amazing cinematography, most of the storylines are good
Pretty good start
The right direction
Definitely should see if you're a fan of the genre
Amazing achievement!!
A great series you can actually watch with your family.
A visual and storytelling masterpiece.
Beautifully, thoughtfully made
Watched the whole thing: surprisingly good!
Fully prepared to hate this... completely surprised!
A good end to a good season
It's fantastic

```
In [15]: transformers.set_seed(8)
generate(prompt, max_new_tokens=100, do_sample=True, top_p=0.9,
         num_outputs=3, exclude_prompt=True)
```

```
Watched the entire season.
Watched some of the first 2 episodes
Watched the whole season.
Watched 1 episode for the first time.
Watched the whole season.
Pretty good finale. Definitely worth watch<|endoftext|>
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Just a wonderful start. The series is a really strong foundation to build on for the next
season.
We have the opportunity to watch it all in one place.
Watch it online: https://www.youtube.com/watch?v=1q5B8HvWn2G
The ending of the series is so good and the first season is pretty cool (I really recommen
d this series).
This show has a certain element of drama.
This series is just great
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Very well done for the price.
I've not really seen much of the series and I don't want to start over with one in my life
time.
But if you've got any issues with viewing this season, just wait until you read the review
s, and be sure to rate this season. I really love this book. It's absolutely worth the pri
ce and a great read.<|endoftext|>
```

```
In [16]: transformers.set_seed(9)
shuffled_negative_training_reviews = copy.copy([
    review for review, label in training_reviews_with_labels
    if label == 'negative'
])
random.shuffle(shuffled_negative_training_reviews)

prompt = '\n'.join(shuffled_negative_training_reviews) + '\n'
```

```
In [17]: print(prompt)
```

```
Could have been so much more
I mourn for what this could have been
An ok fantasy story that has little to do with Tolkien
Horrible writing, slow plot, and disrespectful
More boring than logic homework
What is this, an Anti-FanFic or something? Please read the books!
A major disappointment
Boring, even for generic fantasy
So many problems
Short version, skip it. You'll know you did right when you don't hear people talking about
it.
Just bad all around
```

```
In [18]: transformers.set_seed(10)
generate(prompt, max_new_tokens=100, do_sample=True, top_p=0.9,
         num_outputs=3, exclude_prompt=True)
```

```
There's an awful lot of bad stuff here, but I won't talk about it again
It's a fantasy about dragons, magic, magic, and magic
A good story about dragons and magic that has no real plot or plot devices, so not really
interesting
A story about magic that has no plot or plot devices, so not really interesting. And it's
written by a very well rounded writer. It has no plot or plot devices.
I wish they didn't tell a similar story
```

This series is an example of what a bad genre can be. A series that has failed to live up to the expectations of the fans, and who are the only ones who can get their work into a fair distribution? It's so bad that it has become such a massive waste of time for this project. I wish I could tell you all the reasons why, but it doesn't seem that way. The main reason for that is because of the many problems and plot holes that the first novel has

Well, that's what we say in fantasy. That's what we call it, but this isn't it, this isn't what we call it. It's not what you thought it was.

So, here's our first rule: Don't tell anybody about it. Don't tell them about anything about it. We know this is what you are thinking and you should. The only thing you really need to tell them is this:

No, it is not an Anti-FanF