

Sequels using GPT-2

Shobhit Behl, Tejas Kotha, Ayush Saraswat

International Institute of Information Technology Bangalore

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Overview

The Problem Statement

Model

Output

The Problem Statement

Given a novel, the goal is to generate alternative sequels while preserving the writing style of the original author. The goal is to achieve this using unsupervised learning.

Example

- ▶ Input: 3 volumes of 'A Tale of Two Cities' by Charles Dickens
- ▶ Output: Chapter 1 of the 4th volume

Know How

Open AI's Vanilla GPT-2 will generate beautiful sentences for us

Input Format

A text file of the novel or a series you want a sequel generated for.

Encoder converts it into subwords which can be obtained by Byte Pair Encoding (BPE) algorithm, leveraging the best from word and byte level language modeling

Output Format

A text file with the request number of samples with appropriate number of words as per the `output_length` in the hyperparameters

Architecture

GPT-2 leverages transformer model similar to GPT.

While the differences are:

- ▶ Moving normalization layer to the input of each sub-block
- ▶ Adding normalization layer after final self-attention model

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GPT-2 leverages transformer model similar to GPT. While the major differences are:

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Due to resource limitations we used the 345M model for our project

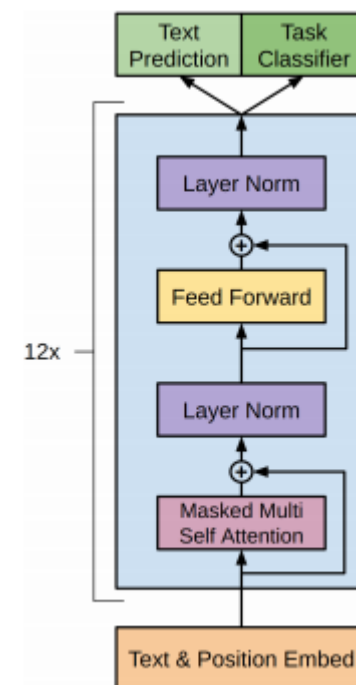


Figure 1: Architecture

Parameters	Layers	d_{model}
117M	12	768
345M	24	1024
762M	36	1280
1542M	48	1600

Figure 2: Architecture hyperparameters for the 4 model sizes.

Loss Function

Mean of **Sparse Softmax Cross Entropy**

Inference

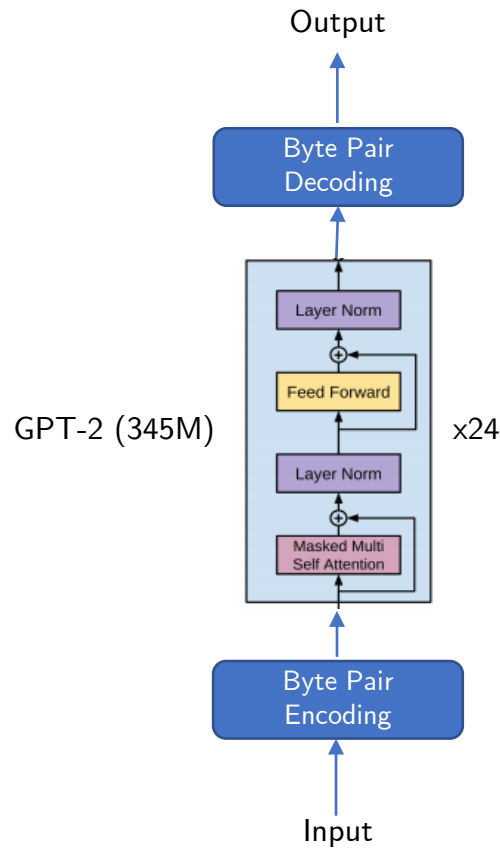


Figure 2: Architecture Inference

Output *(117M, 10,700 epochs, avg loss: 0.09)* for A Tale of Two Cities

the face, or face down?" "The latter," answered Darnay, shaking his head. "I think the learned who write for them," said Carton, shaking his head again, "believe that the learned who write for them are that informed." "They don't pay their dues," observed Jacques Two. "They don't pay it." "They don't call themselves abolitionists," said Carton. "No. They don't call themselves in the least _Encyst_ of _their_ rights their that decent pay. They don't call themselves philosophers," but had really _good_ reasons for believing in the impostors and inifents of the tradesmen who make _that_ well.

Decidedly, the fellow on the third horse, who was set down at the counter, perceived that it was his fault, and passed a word or two into experience: elation, to the vesture of his dead horse, and to the grizzled hoof-man in the head, and both were shaken by their turn in the street. "Liberty, equality, fraternity, or death!" said the one bull-mayower who was to do business with _everything_ (the learned man (the professed _professed _to be) in his reputations and in his iniquity (the professed Monsieur's little vice was capable of many beneficial things, if it were kept out of the way of night), "is the only good thing that can ever be destroyed.--What is the greatest mistake, my friend?" "Afraid not, my learned friend, to wipe out an entire race of good Republicans by one dose of Medicine!" "That's right, that's right!" said the learned man, with a sprinkling of of fear in his voice.

"That's what will befallenistanwercheryin this hollow town!" "It is but one of many injuriousnesses to be obliterated, madame, the learned man of _your_ knowledge, says, _though _it's_ one of many many things. It is the key to the root of_ the fatal pestilence, and it can be made submissive to any one with a key. That's one of them. It is a key todestruction of this city, and ofdestruction of all French speech in this wretched town. That's two keys. That's three keys. That's four keys. That's five keys. Sigh! That's six.

With a heart of Maurice, with a mind as strong as that of Lucie, with a heart as strong as that of Lucie but with compassion for the hungry and poor, and minds of sacrifice, and even of sacrifice--a a soul strong with love and remembrance--a soul strong in the sight of those in good Company, and in the sight of all the living and dead, this Guillotine will charge and roar upon its lonely victims. "My learned friend, my mother's husband, that very moment before, when he spoke to her pulsated with fear and anger; but no voice ever stirred from among the keys than that of his; nor does his voice ever speak to my Guillotine now. "He that stands before me in this prison, will you follow me? He who stands before me in this prison shall swiftly go to himself to prepare himself for us. He who stands before me in prison beforehand shall execute her orders with perfect quickness, and with the quickest hand she knew. "What will you do for my boy?" said Madame Defarge. " Will you accompany him to the courtyard? He that stands before me in prison shall drive and devour this boy." "I doubt which of the two will avail himself of the help he has but little under his wings, or the best prospects, or the reward of his hard labour would be?" "I doubt either, madame. Ludgate will tell me which will avail him or the worst opportunity--the worse for him or the better for the boy, the wiser for him--the reference was, to what would he regret. But, the reference was bad enough, the worst result for him; he had looked into the future and had looked into the past, and could not decide. "If he were capable of making shoes," said

Output *(345M, 29,500 epochs, avg loss: 0.46)* for A Tale of Two Cities

of what that was. The lookers-on there was not to be a chance for anybody, under the circumstances, but he must always have had his head hanging over when the Doctor talked to drop, and they began to drop. "I hope she will do well now," said Mr. Lorry. "No thanks to you in brown, if she does. My darling pretty!" "I hope," said Mr. Lorry, after another pause of feeble sympathy and humility, "that you accompany Miss Manette to France?" "A likely thing, too!" replied the strong woman. "If it was ever intended that I should go across salt water, do you suppose Providence would have cast my lot in an island?" This being another question hard to answer, Mr. Jarvis Lorry withdrew to consider it.

V. The Wine-shop

A large cask of wine had been dropped and broken, in the street. The accident had happened in getting it out of a cart; the cask had tumbled out with a run, the hoops had burst, and it lay on the stones just outside the door of the wine-shop, shattered like a walnut-shell. All the people within reach had suspended their business, or their idleness, to run to the spot and drink the wine. The rough, irregular stones of the street, pointing every way, and designed, one might have thought, expressly to lame all living creatures that approached them, had dammed it into little pools; these were surrounded, each by its own jostling group or crowd, according to its size. Some men kneeled down, made scoops of their two hands joined, and sipped, or tried to help women, who bent over their shoulders, to sip, before the wine had all run out between their fingers. Others, men and women, dipped in the puddles with little mugs of mutilated earthenware, or even with handkerchiefs from women's heads, which were squeezed dry into infants' mouths; others made small mud-embankments, to stem the wine as it ran; others, directed by lookers-on up at high windows, darted here and there, to cut off little streams of wine that started away in new directions; others devoted themselves to the sodden and lee-dyed pieces of the cask, licking, and even champing the moister wine-rotted fragments with eager relish. There was no drainage to carry off the wine, and not only did it all get taken up, but so much mud got taken up along with it, that there might have been a scavenger in the street, if anybody acquainted with it could have believed in such a miraculous presence.

A shrill sound of laughter and of amused voices--voices of men, women, and children--resounded in the street while this wine game lasted. There was little roughness in the sport, and much playfulness. There was a special companionship in it, an observable inclination on the part of every one to join some other one, which led, especially among the luckier or lighter-hearted, to frolicsome embraces, drinking of healths, shaking of hands, and even joining of hands and dancing, a dozen together. When the wine was gone, and the places where it had been most abundant were raked into a gridiron-pattern by fingers, these demonstrations ceased, as suddenly as they had broken out. The man who had left his saw sticking in the firewood he was cutting, set it in motion again; the women who had left on a door-step the little pot of hot ashes, at which she had been trying to soften the pain in her own starved fingers and toes, or in those of her child, returned to it; men with bare arms, matted locks, and cadaverous faces, who had emerged into the winter light from cellars, moved away, to descend again; and a gloom gathered on the scene that appeared more natural to it than sunshine.

The wine was red wine, and had stained the ground of the narrow street in the suburb of Saint Antoine, in Paris, where it was spilled. It had stained many hands, too, and many faces, and many naked feet, and many wooden shoes. The hands of the man who sawed the wood, left red marks on the billets; and the forehead of the woman who nursed her baby, was stained with the stain of the old

Output *(117M, 4,900 epochs, avg loss: 2.20)* for Lord of The Rings

and some small birds. He laughed. `If I hadn't got you, none of this would have happened. And if you haven't got you, none of this would have gone wrong. `I was the one who got the beast, and the one who saved you. My hand was sore and the heart fell. But you've saved me, don't you? And it's true. If I hadn't got you, none of this would have happened. And if you haven't got you, none of this would have gone wrong. I've saved you. I've saved my kin, don't you. Haven't you heard the saying? Haven't you heard it before? I've saved, my kin. Haven't you heard it? That's what it's like. Haven't you heard it? You can't escape from the Dark Tower, aren't you? Haven't you heard the one that said `_save yourself?_?` `_` `No, I didn't hear the one. Haven't you heard the one? `_save yourself?` `_` Yes, I heard it, and I spoke the wrong way. Haven't you heard the one then, `_save yourself?_?` Don't you hear the one then? `_` `No, I haven't. I've just been too lost in thought to make it. What are you looking for, `_save yourself?_?` `_` `I'm here, `_` I'm the one who saved you. I can help you,' said the voice again, stronger, `_` more than ever, more. Well go! `_`

Then it was Snowmane's turn again, and he took off his hood, and he stood like a statue: and he said, `_save yourself?_` `_` No, not this time. I've been too busy. There he is. I'm going to bed. `_` `_` 'Ah!' said Pippin. 'I thought you said `_save yourself?_`. And that was true. I said `_save myself`. But I've put on the coveralls for `_napping_` – `_myself,` `_` and, `_to-do,` `_` and there you go. Now I'm off to meet you – but before I get to sleep, there's a good deal of work to do.' `Did you hear that right, Mr. Pippin? I don't know what I'm going to do for a day,' said Tom. 'It won't be good enough on its own, and unless you really care about me, you can't help but feel sorry for me. I don't care: I'm not going to settle down and find a nice new life in this strange land. But I haven't left this world to fend for myself; and I've got to do a lot of the house-cleaning – but that's not really my field yet. I'll do what I can.' `_` "Work?" `_` came the reply from the other side of the door. Tom turned and went out. 'Work, eh? But you, `_can't-t-t-tlet?_` 'I jeered Gollum, and he stooped to pick up a black-coat. 'No, neither!' said Tom slowly and ruefully. 'I don't think I meant to. I was just going to say that any black-coat that I now have is fine for any job. But I've had my nose deep enough in these dark holes to think of doing anything else.' And then, looking worried, `_gollum,` gnashing your teeth `_` as you would an old man, `_gollum-gnollum,` `_gollum_` at best. 'Aegon, `_lembas,` `_`. He's dead, so I'll take it of him. `_` Gollum! I've got him in my arms.' But even as he spoke, though he was trembling, a shadow of pity fell on Gimli, and he ran after it for a moment. Before he had even had a chance to catch it, however, before him, as he struggled down the lane to the door, came Gollum. 'Elrond is gone for good again! ' he muttered. 'Yes!' he cried. `Yes!' laughed Gollum. 'I can't find myself here any more. We've got to go on. But you, `_gollum-gollum;_`, don't go! Don't tell, not talk! I'll not go with Gollum.' 'Don't! Not Tell!' said Tom.

Output *(345M, 4,900 epochs, avg loss: 1.25)* for Lord of The Rings

, and was a dark hill where all hope of sunlight lost or gained was in its shadows. The land was not green. Here, far to the north, the great flats and walls of the Ice-wall stood, and their immense crags were edged with fume-shrouded chasms; and through all the shales and cliffs men felt the chilling chill running in many directions.

They set out again at dawn. A dark dripping hour they set off. Suddenly they heard a sound like the rumble of many rushing water-towers scattering like a drum. But it seemed to them that it came from another world altogether. Far off, like a sound of waves in a windless air, something like a thunderclap was heard; and then a distant bell ringing like the wind blowing in the mountains rang out. To Gollum their guide they followed a winding road that went upwards from the feet of the hills, until it took a sudden sharp bend southwards. It climbed steeply, and fell soon from a high chasm into the bleak valleys of the Eryn Muil, now a deep yawning pit. For a while they were content to let this desolate and forbidding hollow mould them, and to turn a caret blind eye while travellers passed by. In their gazes they wondered sometimes what was creeping in the shadows, and whether the mountains were not harbouring orcs of evil valour; but they were thankful no longer, for soon they were obliged to leave the path and follow those that strode ahead. A great black tower loomed before them on the right, and before its shadow they glimpsed a narrow path between two rocky outcroppings. At the bottom of the path there was a small cavernous opening, through which the cold wind blew steadily.

'I wonder if that is Barliman Bay?' said Frodo. 'It may well be so,' said Mr. Butterbur. 'But I am not a traveller. I do not wish to see or even hear of battle or of the coming of war. I only wish to see and hear how the Black Riders are governing themselves. It seems to me that we must leave them for the present, unless there be some great event that, though unconnected, demands attention. The Ring!' He laughed. 'And now you have spoken of the Ring!' said Frodo. 'What shall we do then?' 'I suppose you have not thought of hiding the Ring!' said Mr. Butterbur. 'It will be obvious soon enough. And we shall have to contend with Gollum a good deal longer. If the Ring were not so easily obtained, we would be utterly ruined. The only course left to us is to endure it. But that is a dangerous game to play, for we may find our strength is wanting again.' 'It is a very dangerous game to lose,' said Frodo. 'And what shall we do now?' 'Let them go! "I will go to them", they say. "I will take my little friend to them". Do they not see that I am loathing them? I love them, Iren, Iren lad; but these rats I detest, hating them from beginning to end. Not thinking them good, feeling them bad. Treacherous, even. Not to love them! I do not love them! Do you understand me, Frodo? I will go. I will see them again. In a hopeless way, I suppose. I will forgive them. See what comes of it. Very well, I will go. Yes, I will see them again. I will forgive them. And when we met again, I would heal them. But we cannot speak of it further now. We must leave them.' Gollum's face grew grim. 'I know it. They will give us the slip. They will learn our secret, they will betray us. They hate us for our peace and our quiet, for our new ways. In the darkness they would see only a snake: they will see a snake coming at them, one of many snakes. They will hate us, but they will hold us. It is madness!' 'No, it is madness to allow them to go at all,' said Frodo. 'It would be madness to desert them. There are powers greater than they realise, and they are watching. They would see us coming, and they would dash away. The wild beast cannot do what a wizard can.' Gollum made no answer. He looked hard at Frodo, and his eyes glittered. 'I see a snake!' he whispered. 'I see a snake approaching our doom. He does not love us at all.