

# Parchments to Paragraphs: Generative Storytelling with a Harry Potter GPT

# Introduction

We have built a Generative Pretrained Transformer from scratch, following the 'Attention Is All You Need' paper and trained it on the 7 Harry Potter novels. Dataset is available on Github. We try two approaches : the first approach is using the simple Bigram model where the target is predicted solely looking at the last character of the input string. And second, where the characters of the input string communicate with one another to predict the target character.

# Objectives

- 1) Curate and preprocess a dataset comprising the seven canonical Harry Potter novels.
- 2) Implement and train a GPT model on the curated dataset using state-of-the-art techniques.
- 3) Evaluate the model's performance using quantitative metrics, such as perplexity and accuracy.
- 4) Qualitatively assess the model's ability to generate coherent and stylistically consistent narratives within the Harry Potter universe.
- 5) Explore potential applications, limitations, and future research directions for literary language models.

# MODEL ARCHITECTURE AND TRAINING

1) Token and Position Embeddings

2) Transformer Blocks

a) Multi-Head Attention Layer

b) Feed-Forward Layer

c) Layer Normalization

3) Final Layer Norm and Output Layer

# Training Procedure

- 1) Data Preparation:
- 2) Batch Generation
- 3) Loss Computation - Using Cross Entropy
- 4) Optimization - AdamW
- 5) Evaluation
- 6) Text Generation

# Results

```
step 19500: train loss 1.4351, val loss 1.5400
step 19600: train loss 1.4287, val loss 1.5285
step 19700: train loss 1.4297, val loss 1.5394
step 19800: train loss 1.4369, val loss 1.5396
step 19900: train loss 1.4298, val loss 1.5339
step 19999: train loss 1.4285, val loss 1.5288
```

Horcaged, joined Harry's placed draw her eyes form.

"You agree," he said straining here, Peonming pokings, a but to make his disgegoot with a plined.

"Stagning it," said Fudge. 'I just don't it nore neville! Ron and Mrs. But no go still us in maminer and seemed the air. Dumbledore.

The Firenze, but the perming out of termous vious, bwellate...

"Now," said Harry, then she she started to sten regulate Ron squeskions, was stringing he slack, red

doing woaring was balloodone hand howed amone wARHARNGjuson, Pupffinczootm out of into with the end of everything. I'll all ride. . . .'

'So But suitping to voice his felt sound. He lapped like of the Sdruptched a small? Sway, happing to the exworered, it's a air. .

'Look. . . and Severus slid Harry!"

Interville," said Snape kitched mact he last now stirs... .Wit was killerow!"

"Well, maive you need - '

Harry further's trying wated... if his slow. Toduc to Grenth gallishing that bad-shet by not ever, Harry's repeated. They sat hat "he pocket days. Well, "Tight to have turned at I think usual. Aftair, all kifter. Hagrid thought Master Mrs. Weasley out as he couldn't know he couldn't have dincing a nearly centerming it from I couldn't have 0Mystring instance as lance Voldemort, sire's off Invisibilitating out Dumbledore, wet do him to neak! I felt out that he

Okay, not he need it," Harry keith Nothing Mrs. Weasley's right hearth were know that thin all lay dead, reminding from the stragglng, he was like - pu  
APTRE R LADRI PERRINGI beckered Hight his eyebbered fizing thmest

```
step 49700: train loss 1.3678, val loss 1.4696
step 49800: train loss 1.3638, val loss 1.4560
step 49900: train loss 1.3787, val loss 1.4624
step 49999: train loss 1.3764, val loss 1.4704
```

Pyce off him – "To I've known it, Snape's face," said Hermione, and he was so used his bright a-blood – even yeraxing spokeling up the crackled full!  
But if he championed the MinistytonacA Harry. Crouched up the table quitationally, skinny clink after Durns of Hogwarts triumphed into the sondin. It w  
"Nidn't speal smy and he muttered!"

There was breaking for his evide board visuirielly fane.

Dear Chall.

What's He to Harry, I does sprinkles were was noised to get a sign was that the frend obvious readief the end of himself and her stirry. 'And you know th  
Harry repassed it. Evidenous. Fudu-Pet of Crouch, I'm going to give it that his idea wooths, we – threw you send every's swivs in the wand wasn't because  
The certain at his voice sobbe took bridge a proper at the brown attack. Crack in the Roop of "I had anyway flashed up. You having that gone in Hagrid soeful

[+ Code](#)[+ Text](#)

Thank You



All the data used in the project is uploaded on my drive. The recorded presentation is also uploaded on the drive.

Drive Link:

[https://drive.google.com/drive/folders/183b-QiJwXoesdWMTXcmXOxsto4tY-Wdi?usp=share\\_link](https://drive.google.com/drive/folders/183b-QiJwXoesdWMTXcmXOxsto4tY-Wdi?usp=share_link)