```
!git clone https://github.com/karpathy/nanoGPT.git
```

```
Cloning into 'nanoGPT'...
remote: Enumerating objects: 686, done.
remote: Total 686 (delta 0), reused 0 (delta 0), pack-reused 686 (from 1)
Receiving objects: 100% (686/686), 954.04 KiB | 11.92 MiB/s, done.
Resolving deltas: 100% (387/387), done.
```

```
%cd nanoGPT
```

```
/content/nanoGPT
```

```
!python data/shakespeare_char/prepare.py
```

```
length of dataset in characters: 1,115,394
all the unique characters:
 !$&',-.3:;?ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
vocab size: 65
train has 1,003,854 tokens
val has 111,540 tokens
```

```
!pip install torch numpy transformers datasets tiktoken wandb tqdm
```

```
Requirement already satisfied: torch in /usr/local/lib/python3.11/dist-pac
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-pac
Requirement already satisfied: transformers in /usr/local/lib/python3.11/d
Requirement already satisfied: datasets in /usr/local/lib/python3.11/dist-
Requirement already satisfied: tiktoken in /usr/local/lib/python3.11/dist-
Requirement already satisfied: wandb in /usr/local/lib/python3.11/dist-pac
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packl
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-
Requirement already satisfied: typing-extensions>=4.10.0 in /usr/local/lil
Requirement already satisfied: networkx in /usr/local/lib/python3.11/dist-
Requirement already satisfied: jinja2 in /usr/local/lib/python3.11/dist-pa
Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-pa
Collecting nvidia-cuda-nvrtc-cu12==12.4.127 (from torch)
  Downloading nvidia_cuda_nvrtc_cu12-12.4.127-py3-none-manylinux2014_x86_6
Collecting nvidia-cuda-runtime-cu12==12.4.127 (from torch)
  Downloading nvidia_cuda_runtime_cu12-12.4.127-py3-none-manylinux2014_x86
Collecting nvidia-cuda-cupti-cu12==12.4.127 (from torch)
  Downloading nvidia_cuda_cupti_cu12-12.4.127-py3-none-manylinux2014_x86_6
Collecting nvidia-cudnn-cu12==9.1.0.70 (from torch)
  Downloading nvidia_cudnn_cu12-9.1.0.70-py3-none-manylinux2014_x86_64.whl
Collecting nvidia-cublas-cu12==12.4.5.8 (from torch)
  Downloading nvidia_cublas_cu12-12.4.5.8-py3-none-manylinux2014_x86_64.whl
Collecting nvidia-cufft-cu12==11.2.1.3 (from torch)
  Downloading nvidia_cufft_cu12-11.2.1.3-py3-none-manylinux2014_x86_64.whl
```

```
Collecting nvidia-curand-cu12==10.3.5.147 (from torch)
  Downloading nvidia_curand_cu12-10.3.5.147-py3-none-manylinux2014_x86_64.
Collecting nvidia-cusolver-cu12==11.6.1.9 (from torch)
  Downloading nvidia_cusolver_cu12-11.6.1.9-py3-none-manylinux2014_x86_64.
Collecting nvidia-cusparse-cu12==12.3.1.170 (from torch)
  Downloading nvidia_cusparse_cu12-12.3.1.170-py3-none-manylinux2014_x86_6
Requirement already satisfied: nvidia-cusparselt-cu12==0.6.2 in /usr/local
Requirement already satisfied: nvidia-nccl-cu12==2.21.5 in /usr/local/lib/
Requirement already satisfied: nvidia-nvtx-cu12==12.4.127 in /usr/local/li
Collecting nvidia-nvjitlink-cu12==12.4.127 (from torch)
  Downloading nvidia_nvjitlink_cu12-12.4.127-py3-none-manylinux2014_x86_64
Requirement already satisfied: triton==3.2.0 in /usr/local/lib/python3.11/
Requirement already satisfied: sympy==1.13.1 in /usr/local/lib/python3.11/
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python
Requirement already satisfied: huggingface-hub<1.0,>=0.30.0 in /usr/local/
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.1
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.11/di
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-
Requirement already satisfied: tokenizers<0.22,>=0.21 in /usr/local/lib/py
Requirement already satisfied: safetensors>=0.4.3 in /usr/local/lib/python
Requirement already satisfied: pyarrow>=8.0.0 in /usr/local/lib/python3.11
Requirement already satisfied: dill<0.3.8,>=0.3.0 in /usr/local/lib/python
Requirement already satisfied: pandas in /usr/local/lib/python3.11/dist-pa
Requirement already satisfied: xxhash in /usr/local/lib/python3.11/dist-pa
Requirement already satisfied: multiprocess in /usr/local/lib/python3.11/d
Requirement already satisfied: aiohttp in /usr/local/lib/python3.11/dist-p
Requirement already satisfied: click!=8.0.0,>=7.1 in /usr/local/lib/python
Requirement already satisfied: gitpython!=3.1.29,>=1.0.0 in /usr/local/lib
Requirement already satisfied: platformdirs in /usr/local/lib/python3.11/d
Requirement already satisfied: protobuf!=4.21.0,!=5.28.0,<7,>=3.19.0 in /u
Requirement already satisfied: psutil>=5.0.0 in /usr/local/lib/python3.11/
Requirement already satisfied: pydantic<3 in /usr/local/lib/python3.11/dis
Requirement already satisfied: sentry-sdk>=2.0.0 in /usr/local/lib/python3
```

```
!python train.py config/train_shakespeare_char.py --compile=False
```

```
Overriding config with config/train_shakespeare_char.py:
# train a miniature character-level shakespeare model
# good for debugging and playing on macbooks and such

out_dir = 'out-shakespeare-char'
eval_interval = 250 # keep frequent because we'll overfit
eval_iters = 200
log_interval = 10 # don't print too too often

# we expect to overfit on this small dataset, so only save when val improv
always_save_checkpoint = False

wandb_log = False # override via command line if you like
wandb_project = 'shakespeare-char'
wandb_run_name = 'mini-gpt'
```

```
dataset = 'shakespeare_char'
gradient_accumulation_steps = 1
batch_size = 64
block_size = 256 # context of up to 256 previous characters

# baby GPT model :)
n_layer = 6
n_head = 6
n_embd = 384
dropout = 0.2

learning_rate = 1e-3 # with baby networks can afford to go a bit higher
max_iters = 5000
lr_decay_iters = 5000 # make equal to max_iters usually
min_lr = 1e-4 # learning_rate / 10 usually
beta2 = 0.99 # make a bit bigger because number of tokens per iter is sma

warmup_iters = 100 # not super necessary potentially

# on macbook also add
# device = 'cpu'  # run on cpu only
# compile = False # do not torch compile the model

Overriding: compile = False
tokens per iteration will be: 16,384
found vocab_size = 65 (inside data/shakespeare_char/meta.pkl)
Initializing a new model from scratch
number of parameters: 10.65M
/content/nanoGPT/train.py:196: FutureWarning: `torch.cuda.amp.GradScaler(a
  scaler = torch.cuda.amp.GradScaler(enabled=(dtype == 'float16'))
num decayed parameter tensors: 26, with 10,740,096 parameters
num non-decayed parameter tensors: 13, with 4,992 parameters
using fused AdamW: True
step 0: train loss 4.2874, val loss 4.2823
iter 0: loss 4.2664, time 69850.79ms, mfu -100.00%
iter 10: loss 3.1421, time 512.16ms, mfu 0.73%
iter 20: loss 2.7345, time 511.90ms, mfu 0.73%
iter 30: loss 2.6178, time 514.72ms, mfu 0.73%
iter 40: loss 2.5734, time 519.02ms, mfu 0.73%
iter 50: loss 2.5265, time 519.48ms, mfu 0.73%
iter 60: loss 2.5110, time 523.59ms, mfu 0.72%
iter 70: loss 2.4956. time 524.66ms. mfu 0.72%
```

```
!pip install matplotlib
```

```
Requirement already satisfied: matplotlib in /usr/local/lib/python3.11/dist
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.1
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/di
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.
Requirement already satisfied: numpy>=1.23 in /usr/local/lib/python3.11/dis
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11
Requirement already satisfied: pillow>=8 in /usr/local/lib/python3.11/dist-
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.1
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/pytho
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-p
```

```
!python sample.py --out_dir=out-shakespeare-char
```

```
Overriding: out_dir = out-shakespeare-char
number of parameters: 10.65M
Loading meta from data/shakespeare_char/meta.pkl...


AUTOLYCUS:
O, will you be straight.

MENENIUS:
Stirrd your gates?

CORIOLANUS:
You met?

MENENIUS:
Nay, no more not to be much:
If you find it out of much but soils, since I lay you,
I'll speak with her person of else no more.

AUFIDIUS:
I would have show'd your name.
Be patient o'er the world that
Would so what evil so you would have no precise of mine;
Which you have forgot a sign of sheet in all of person
The ground.

CORIOLANUS:
So it was a brace of the viil court:
A very ready change to th
---------------

Men pardon me, you shall have hanged to myself.

Lord:
We must danger than I have no world.
```

```
DUKE VINCENTIO:
Why, how now!

LUCIO:
That which shall be been lost to die?

LUCIO:
For he that might have breathed the nurse o' the chance
the side and entreaty of the bear
Of great-brother than the lumb and her sons
That this here senses, his head in posterity,
To extermity the offices
That no steel unmanlips that will perform,
Which in me we know not here will be married to be out
That I should wish t
---------------

Messenger:
The soft is full of all.

LARTIUS:
No, but not take the complexion, and
I need to thine eyes; but till this show
```

```
!python sample.py --out_dir=out-shakespeare-char
```

```
To swear me, best the wind of love
That I advised with thee.

First Lord:
He had no love in the better send of night:
Nay, how you hear me hear me tell me, Henry's name;
Nor else, that this is dead!

Second Murderer:
Hence, tell me thy hath the king's power.

CLARENCE:
Know't.

CLARENCE:
Thou hast not a soldier doing.

KING LEWIS XI:
Lord Xatharina me and my mother?

GLOUCE
---------------
Who are you?

KING RICHARD III:
The statue of all the fires: the rest
```

```
Being so conduct'd to be fought in so escuped
Have made the half of the lists of the Alms,
That love it begetter the record of the traitor,
How fares her my soul, were my sword:
And with such sorrows coal when they have sing not.
The very silly danger and the field ado.

FRIAR LAURENCE:
The prophecies for this, to the story of the sense wood
Of whom should I see the joy of her is grown.

LADY CAPULET:
How dost thou remember where, this si
---------------
Who are you? there I have a dread:
I am the day of fortune of your kin,
Villain of flowers into yourself.

BRUTUS:
Not so sweat so sacred love.

BRUTUS:
I think there.

MENENIUS:
Not so, not resolved now:
I have heard your own wounds yours.

SICINIUS:
He would seem your gifts and to speak
their prey to aught hear as their perform'd
for peril ears; they are not too too poor mercyary beauty
to enterpress it. Meet you have pass'd him in his throne
```

```
!python sample.py --out_dir=out-shakespeare-char
```

```
Overriding: out_dir = out-shakespeare-char
number of parameters: 10.65M
Loading meta from data/shakespeare_char/meta.pkl...
The capital of Singapore is no less true.

HENRY BOLINGBROKE:
The obey were the day that hath been thee
Have they been that a full of my faces
Of my soul absenced fortune of mine,
But with it ended ministers. This breath in me
I have sworn self-words and like men with starriors.

KING RICHARD II:
I pray thee, to my woe more kneckly so when I in so,
And bid it so much must be more for use to my brother son;
And though not male of my souls we may make my soul
To my soar and be her graced fine mistrass.
```

```
HENRY BOLINGBROKE:
M
---------------
The capital of Singapore is the sea,
And such seven the ear of a child,
As you shall be made, sir, as I have not been
In proud that perish and sound myself.

SLY:
So, though I have been to die and desire in me;
And if I do do sorry my lord and contempts
To the good duke in my fortune and bear
In great brother than my household,
Whose lacks my life and shows my lord, and put on me,
In this most I do it in out. Come, commend me protest.

MARCIUS:
Have sometimely like to the harm!

MARCIUS:
Sir, if I do not force you well he
---------------
The capital of Singapore is Tranio,
And you are, I humbly in him.

BRUTUS:
Come, sir, and I would you bring your penitence
Beseech your highness for Rome, he is so
That he should go about him in this action,
And find you bid him delay him from and his conceit
That have even such more determined.

BRUTUS:
Then let prove him there was a good voices of the people,
Not be not short to be brief; then the people thirth
That to put by the power.

MENENIUS:
One of her banishmentment in ten the people,
And yet here and no more wel
---------------
```

Start coding or generate with AI.

```
# 1. Copy the entire output from your training run and paste it inside the tripl
# Make sure to include all the lines that look like "step 250: train loss 2.0725
log_data = """
step 0: train loss 4.2874, val loss 4.2823
iter 0: loss 4.2664, time 69850.79ms, mfu -100.00%
iter 10: loss 3.1421, time 512.16ms, mfu 0.73%
```

```
iter 20: loss 2.7345, time 511.90ms, mfu 0.73%
iter 30: loss 2.6178, time 514.72ms, mfu 0.73%
iter 40: loss 2.5734, time 519.02ms, mfu 0.73%
iter 50: loss 2.5265, time 519.48ms, mfu 0.73%
iter 60: loss 2.5110, time 523.59ms, mfu 0.72%
iter 70: loss 2.4956, time 524.66ms, mfu 0.72%
iter 80: loss 2.4940, time 528.63ms, mfu 0.72%
iter 90: loss 2.4703, time 532.63ms, mfu 0.72%
iter 100: loss 2.4566, time 535.28ms, mfu 0.72%
iter 110: loss 2.4512, time 533.27ms, mfu 0.71%
iter 120: loss 2.4283, time 528.87ms, mfu 0.71%
iter 130: loss 2.4101, time 528.21ms, mfu 0.71%
iter 140: loss 2.4184, time 524.09ms, mfu 0.71%
iter 150: loss 2.4237, time 522.57ms, mfu 0.71%
iter 160: loss 2.3839, time 520.99ms, mfu 0.71%
iter 170: loss 2.3574, time 521.25ms, mfu 0.71%
iter 180: loss 2.3153, time 520.07ms, mfu 0.71%
iter 190: loss 2.2506, time 522.90ms, mfu 0.71%
iter 200: loss 2.2119, time 522.74ms, mfu 0.71%
iter 210: loss 2.1391, time 524.75ms, mfu 0.71%
iter 220: loss 2.1315, time 526.81ms, mfu 0.71%
iter 230: loss 2.0739, time 527.73ms, mfu 0.71%
iter 240: loss 2.0785, time 530.34ms, mfu 0.71%
step 250: train loss 1.9572, val loss 2.0615
saving checkpoint to out-shakespeare-char
iter 250: loss 2.0310, time 74856.33ms, mfu 0.64%
iter 260: loss 1.9766, time 523.26ms, mfu 0.65%
iter 270: loss 1.9743, time 524.59ms, mfu 0.65%
iter 280: loss 1.9706, time 523.85ms, mfu 0.66%
iter 290: loss 1.9249, time 525.30ms, mfu 0.66%
iter 300: loss 1.9007, time 526.07ms, mfu 0.67%
iter 310: loss 1.8542, time 527.79ms, mfu 0.67%
iter 320: loss 1.8442, time 528.94ms, mfu 0.68%
iter 330: loss 1.8144, time 530.35ms, mfu 0.68%
iter 340: loss 1.7846, time 529.21ms, mfu 0.68%
iter 350: loss 1.8244, time 527.79ms, mfu 0.68%
iter 360: loss 1.7573, time 528.78ms, mfu 0.69%
iter 370: loss 1.7368, time 528.71ms, mfu 0.69%
iter 380: loss 1.7255, time 528.15ms, mfu 0.69%
iter 390: loss 1.7323, time 527.44ms, mfu 0.69%
iter 400: loss 1.7661, time 530.35ms, mfu 0.69%
iter 410: loss 1.6972, time 527.30ms, mfu 0.69%
iter 420: loss 1.7075, time 527.02ms, mfu 0.70%
iter 430: loss 1.6903, time 528.89ms, mfu 0.70%
iter 440: loss 1.6565, time 527.12ms, mfu 0.70%
iter 450: loss 1.6497, time 529.40ms, mfu 0.70%
iter 460: loss 1.5939, time 527.29ms, mfu 0.70%
iter 470: loss 1.6546, time 528.38ms, mfu 0.70%
```

```
iter 480: loss 1.6206, time 526.88ms, mfu 0.70%
iter 490: loss 1.6009, time 526.68ms, mfu 0.70%
step 500: train loss 1.5255, val loss 1.7345
saving checkpoint to out-shakespeare-char
iter 500: loss 1.6011, time 74951.39ms, mfu 0.63%
iter 510: loss 1.6049, time 524.27ms, mfu 0.64%
iter 520: loss 1.5938, time 526.90ms, mfu 0.65%
iter 530: loss 1.5625, time 527.84ms, mfu 0.65%
iter 540: loss 1.6213, time 527.02ms, mfu 0.66%
iter 550: loss 1.5650, time 526.98ms, mfu 0.66%
iter 560: loss 1.5658, time 527.70ms, mfu 0.67%
iter 570: loss 1.5653, time 527.58ms, mfu 0.67%
iter 580: loss 1.5399, time 526.56ms, mfu 0.67%
iter 590: loss 1.4954, time 528.31ms, mfu 0.68%
iter 600: loss 1.5169, time 527.22ms, mfu 0.68%
iter 610: loss 1.5409, time 526.91ms, mfu 0.68%
iter 620: loss 1.5249, time 526.95ms, mfu 0.69%
iter 630: loss 1.5092, time 525.22ms, mfu 0.69%
iter 640: loss 1.4691, time 527.33ms, mfu 0.69%
iter 650: loss 1.5024, time 524.70ms, mfu 0.69%
iter 660: loss 1.5116, time 527.32ms, mfu 0.69%
iter 670: loss 1.4494, time 527.86ms, mfu 0.69%
iter 680: loss 1.5110, time 529.05ms, mfu 0.70%
iter 690: loss 1.4617, time 527.60ms, mfu 0.70%
iter 700: loss 1.4864, time 527.33ms, mfu 0.70%
iter 710: loss 1.4568, time 528.20ms, mfu 0.70%
iter 720: loss 1.4428, time 528.00ms, mfu 0.70%
iter 730: loss 1.4228, time 526.53ms, mfu 0.70%
iter 740: loss 1.4255, time 528.33ms, mfu 0.70%
step 750: train loss 1.3618, val loss 1.5939
saving checkpoint to out-shakespeare-char
iter 750: loss 1.4324, time 74986.26ms, mfu 0.63%
iter 760: loss 1.4374, time 525.28ms, mfu 0.64%
iter 770: loss 1.4199, time 524.33ms, mfu 0.65%
iter 780: loss 1.4192, time 526.53ms, mfu 0.65%
iter 790: loss 1.4182, time 526.54ms, mfu 0.66%
iter 800: loss 1.4286, time 527.58ms, mfu 0.66%
iter 810: loss 1.3963, time 526.46ms, mfu 0.67%
iter 820: loss 1.4067, time 528.26ms, mfu 0.67%
iter 830: loss 1.3897, time 528.83ms, mfu 0.67%
iter 840: loss 1.3975, time 527.44ms, mfu 0.68%
iter 850: loss 1.3888, time 527.45ms, mfu 0.68%
iter 860: loss 1.3942, time 528.94ms, mfu 0.68%
iter 870: loss 1.3948, time 526.54ms, mfu 0.69%
iter 880: loss 1.3734, time 525.78ms, mfu 0.69%
iter 890: loss 1.3830, time 529.78ms, mfu 0.69%
iter 900: loss 1.3685, time 527.16ms, mfu 0.69%
iter 910: loss 1.3202, time 527.35ms, mfu 0.69%
iter 920: loss 1.3628, time 527.98ms, mfu 0.69%
```

```
iter 920: loss 1.3028, time 527.98ms, mfu 0.69%
iter 930: loss 1.3630, time 529.07ms, mfu 0.69%
iter 940: loss 1.3375, time 528.88ms, mfu 0.70%
iter 950: loss 1.3487, time 527.08ms, mfu 0.70%
iter 960: loss 1.3638, time 527.27ms, mfu 0.70%
iter 970: loss 1.3546, time 525.73ms, mfu 0.70%
iter 980: loss 1.3575, time 526.99ms, mfu 0.70%
iter 990: loss 1.3372, time 525.70ms, mfu 0.70%
step 1000: train loss 1.2700, val loss 1.5153
saving checkpoint to out-shakespeare-char
iter 1000: loss 1.3323, time 75027.48ms, mfu 0.63%
iter 1010: loss 1.3346, time 525.65ms, mfu 0.64%
iter 1020: loss 1.3133, time 525.98ms, mfu 0.65%
iter 1030: loss 1.3390, time 528.37ms, mfu 0.65%
iter 1040: loss 1.3635, time 528.09ms, mfu 0.66%
iter 1050: loss 1.2978, time 526.54ms, mfu 0.66%
iter 1060: loss 1.3423, time 527.58ms, mfu 0.67%
iter 1070: loss 1.3344, time 527.60ms, mfu 0.67%
iter 1080: loss 1.3348, time 528.73ms, mfu 0.67%
iter 1090: loss 1.3509, time 527.19ms, mfu 0.68%
iter 1100: loss 1.3144, time 527.78ms, mfu 0.68%
iter 1110: loss 1.2982, time 527.95ms, mfu 0.68%
iter 1120: loss 1.3019, time 528.08ms, mfu 0.69%
iter 1130: loss 1.2981, time 525.29ms, mfu 0.69%
iter 1140: loss 1.2975, time 526.07ms, mfu 0.69%
iter 1150: loss 1.3056, time 527.21ms, mfu 0.69%
iter 1160: loss 1.3293, time 528.07ms, mfu 0.69%
iter 1170: loss 1.2993, time 527.12ms, mfu 0.69%
iter 1180: loss 1.3187, time 528.78ms, mfu 0.70%
iter 1190: loss 1.2622, time 528.01ms, mfu 0.70%
iter 1200: loss 1.2932, time 528.23ms, mfu 0.70%
iter 1210: loss 1.2590, time 530.50ms, mfu 0.70%
iter 1220: loss 1.3061, time 527.38ms, mfu 0.70%
iter 1230: loss 1.2969, time 530.09ms, mfu 0.70%
iter 1240: loss 1.3021, time 524.21ms, mfu 0.70%
step 1250: train loss 1.2038, val loss 1.4965
saving checkpoint to out-shakespeare-char
iter 1250: loss 1.2697, time 75002.78ms, mfu 0.63%
iter 1260: loss 1.2837, time 526.45ms, mfu 0.64%
iter 1270: loss 1.2645, time 528.94ms, mfu 0.64%
iter 1280: loss 1.2518, time 528.00ms, mfu 0.65%
iter 1290: loss 1.2843, time 525.81ms, mfu 0.66%
iter 1300: loss 1.3016, time 526.83ms, mfu 0.66%
iter 1310: loss 1.2394, time 525.40ms, mfu 0.67%
iter 1320: loss 1.3073, time 527.99ms, mfu 0.67%
iter 1330: loss 1.2619, time 527.07ms, mfu 0.67%
iter 1340: loss 1.2983, time 526.83ms, mfu 0.68%
iter 1350: loss 1.2583, time 527.38ms, mfu 0.68%
iter 1360: loss 1.2772, time 527.32ms, mfu 0.68%
```

```
iter 1370: loss 1.2551, time 528.71ms, mfu 0.69%
iter 1380: loss 1.2624, time 528.26ms, mfu 0.69%
iter 1390: loss 1.2475, time 526.85ms, mfu 0.69%
iter 1400: loss 1.2503, time 527.36ms, mfu 0.69%
iter 1410: loss 1.2437, time 528.69ms, mfu 0.69%
iter 1420: loss 1.2690, time 526.31ms, mfu 0.69%
iter 1430: loss 1.2472, time 530.45ms, mfu 0.69%
iter 1440: loss 1.2456, time 526.32ms, mfu 0.70%
iter 1450: loss 1.2310, time 527.37ms, mfu 0.70%
iter 1460: loss 1.2380, time 527.78ms, mfu 0.70%
iter 1470: loss 1.2198, time 528.00ms, mfu 0.70%
iter 1480: loss 1.2060, time 528.11ms, mfu 0.70%
iter 1490: loss 1.2349, time 526.06ms, mfu 0.70%
step 1500: train loss 1.1492, val loss 1.4737
saving checkpoint to out-shakespeare-char
iter 1500: loss 1.1842, time 75001.02ms, mfu 0.63%
iter 1510: loss 1.2325, time 524.36ms, mfu 0.64%
iter 1520: loss 1.2276, time 527.74ms, mfu 0.65%
iter 1530: loss 1.2568, time 528.63ms, mfu 0.65%
iter 1540: loss 1.1957, time 529.02ms, mfu 0.66%
iter 1550: loss 1.2305, time 529.62ms, mfu 0.66%
iter 1560: loss 1.2036, time 527.89ms, mfu 0.67%
iter 1570: loss 1.2350, time 528.28ms, mfu 0.67%
iter 1580: loss 1.2088, time 527.61ms, mfu 0.67%
iter 1590: loss 1.1906, time 528.65ms, mfu 0.68%
iter 1600: loss 1.1949, time 527.91ms, mfu 0.68%
iter 1610: loss 1.2376, time 528.14ms, mfu 0.68%
iter 1620: loss 1.1775, time 527.27ms, mfu 0.68%
iter 1630: loss 1.2023, time 526.81ms, mfu 0.69%
iter 1640: loss 1.1954, time 526.46ms, mfu 0.69%
iter 1650: loss 1.1817, time 527.82ms, mfu 0.69%
iter 1660: loss 1.2117, time 527.40ms, mfu 0.69%
iter 1670: loss 1.2043, time 527.44ms, mfu 0.69%
iter 1680: loss 1.2003, time 527.69ms, mfu 0.69%
iter 1690: loss 1.2007, time 526.95ms, mfu 0.70%
iter 1700: loss 1.1890, time 528.47ms, mfu 0.70%
iter 1710: loss 1.1795, time 525.99ms, mfu 0.70%
iter 1720: loss 1.1815, time 526.98ms, mfu 0.70%
iter 1730: loss 1.2069, time 526.98ms, mfu 0.70%
iter 1740: loss 1.1728, time 526.37ms, mfu 0.70%
step 1750: train loss 1.1006, val loss 1.4642
saving checkpoint to out-shakespeare-char
iter 1750: loss 1.1908, time 74922.69ms, mfu 0.63%
iter 1760: loss 1.1899, time 526.73ms, mfu 0.64%
iter 1770: loss 1.1983, time 525.66ms, mfu 0.65%
iter 1780: loss 1.1889, time 528.13ms, mfu 0.65%
iter 1790: loss 1.1878, time 527.63ms, mfu 0.66%
iter 1800: loss 1.1818, time 525.42ms, mfu 0.66%
```

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iter 1810: loss 1.1610, time 526.15ms, mfu 0.67%
iter 1820: loss 1.1642, time 527.23ms, mfu 0.67%
iter 1830: loss 1.1752, time 525.23ms, mfu 0.67%
iter 1840: loss 1.1591, time 526.85ms, mfu 0.68%
iter 1850: loss 1.1538, time 527.88ms, mfu 0.68%
iter 1860: loss 1.1728, time 528.27ms, mfu 0.68%
iter 1870: loss 1.1443, time 526.33ms, mfu 0.69%
iter 1880: loss 1.1845, time 527.70ms, mfu 0.69%
iter 1890: loss 1.1780, time 528.79ms, mfu 0.69%
iter 1900: loss 1.1288, time 526.92ms, mfu 0.69%
iter 1910: loss 1.1669, time 526.93ms, mfu 0.69%
iter 1920: loss 1.1693, time 526.86ms, mfu 0.69%
iter 1930: loss 1.1456, time 527.88ms, mfu 0.70%
iter 1940: loss 1.1280, time 525.55ms, mfu 0.70%
iter 1950: loss 1.1340, time 527.30ms, mfu 0.70%
iter 1960: loss 1.1522, time 527.78ms, mfu 0.70%
iter 1970: loss 1.1480, time 525.47ms, mfu 0.70%
iter 1980: loss 1.1362, time 526.97ms, mfu 0.70%
iter 1990: loss 1.1530, time 527.69ms, mfu 0.70%
step 2000: train loss 1.0547, val loss 1.4796
iter 2000: loss 1.1226, time 74785.06ms, mfu 0.63%
iter 2010: loss 1.1255, time 531.73ms, mfu 0.64%
iter 2020: loss 1.1243, time 529.11ms, mfu 0.64%
iter 2030: loss 1.1584, time 527.93ms, mfu 0.65%
iter 2040: loss 1.1426, time 528.32ms, mfu 0.66%
iter 2050: loss 1.1130, time 526.87ms, mfu 0.66%
iter 2060: loss 1.1011, time 526.55ms, mfu 0.67%
iter 2070: loss 1.1274, time 527.05ms, mfu 0.67%
iter 2080: loss 1.1194, time 526.53ms, mfu 0.67%
iter 2090: loss 1.1280, time 528.59ms, mfu 0.68%
iter 2100: loss 1.1346, time 528.28ms, mfu 0.68%
iter 2110: loss 1.1318, time 527.37ms, mfu 0.68%
iter 2120: loss 1.1221, time 526.86ms, mfu 0.69%
iter 2130: loss 1.1357, time 526.75ms, mfu 0.69%
iter 2140: loss 1.1401, time 526.63ms, mfu 0.69%
iter 2150: loss 1.1197, time 528.51ms, mfu 0.69%
iter 2160: loss 1.1464, time 525.75ms, mfu 0.69%
iter 2170: loss 1.1307, time 526.17ms, mfu 0.69%
iter 2180: loss 1.1100, time 528.56ms, mfu 0.70%
iter 2190: loss 1.1047, time 527.20ms, mfu 0.70%
iter 2200: loss 1.1236, time 527.73ms, mfu 0.70%
iter 2210: loss 1.1144, time 527.56ms, mfu 0.70%
iter 2220: loss 1.1241, time 528.24ms, mfu 0.70%
iter 2230: loss 1.1171, time 525.77ms, mfu 0.70%
iter 2240: loss 1.1257, time 528.19ms, mfu 0.70%
step 2250: train loss 1.0074, val loss 1.4860
iter 2250: loss 1.1084, time 74788.35ms, mfu 0.63%
iter 2260: loss 1.1099, time 527.90ms, mfu 0.64%
```

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iter 2270: loss 1.1240, time 528.17ms, mfu 0.65%
iter 2280: loss 1.0932, time 529.37ms, mfu 0.65%
iter 2290: loss 1.1433, time 526.73ms, mfu 0.66%
iter 2300: loss 1.1203, time 528.45ms, mfu 0.66%
iter 2310: loss 1.0976, time 529.81ms, mfu 0.67%
iter 2320: loss 1.0934, time 527.51ms, mfu 0.67%
iter 2330: loss 1.0922, time 527.47ms, mfu 0.67%
iter 2340: loss 1.1130, time 526.61ms, mfu 0.68%
iter 2350: loss 1.1003, time 525.90ms, mfu 0.68%
iter 2360: loss 1.1007, time 528.89ms, mfu 0.68%
iter 2370: loss 1.0830, time 526.40ms, mfu 0.69%
iter 2380: loss 1.0754, time 530.31ms, mfu 0.69%
iter 2390: loss 1.0769, time 527.21ms, mfu 0.69%
iter 2400: loss 1.0788, time 525.74ms, mfu 0.69%
iter 2410: loss 1.0749, time 527.52ms, mfu 0.69%
iter 2420: loss 1.0747, time 528.40ms, mfu 0.69%
iter 2430: loss 1.0553, time 527.09ms, mfu 0.69%
iter 2440: loss 1.0658, time 529.99ms, mfu 0.70%
iter 2450: loss 1.0727, time 528.16ms, mfu 0.70%
iter 2460: loss 1.0874, time 526.85ms, mfu 0.70%
iter 2470: loss 1.0934, time 527.08ms, mfu 0.70%
iter 2480: loss 1.0832, time 527.11ms, mfu 0.70%
iter 2490: loss 1.0571, time 527.77ms, mfu 0.70%
step 2500: train loss 0.9589, val loss 1.4922
iter 2500: loss 1.0830, time 74757.15ms, mfu 0.63%
iter 2510: loss 1.0662, time 527.15ms, mfu 0.64%
iter 2520: loss 1.0469, time 526.65ms, mfu 0.65%
iter 2530: loss 1.0509, time 528.27ms, mfu 0.65%
iter 2540: loss 1.0508, time 528.96ms, mfu 0.66%
iter 2550: loss 1.0610, time 531.37ms, mfu 0.66%
iter 2560: loss 1.0571, time 527.03ms, mfu 0.67%
iter 2570: loss 1.0765, time 528.95ms, mfu 0.67%
iter 2580: loss 1.0836, time 527.90ms, mfu 0.67%
iter 2590: loss 1.0685, time 527.08ms, mfu 0.68%
iter 2600: loss 1.0632, time 528.00ms, mfu 0.68%
iter 2610: loss 1.0462, time 528.20ms, mfu 0.68%
iter 2620: loss 1.0462, time 525.66ms, mfu 0.68%
iter 2630: loss 1.0235, time 527.22ms, mfu 0.69%
iter 2640: loss 1.0444, time 526.07ms, mfu 0.69%
iter 2650: loss 1.0670, time 526.67ms, mfu 0.69%
iter 2660: loss 1.0396, time 526.48ms, mfu 0.69%
iter 2670: loss 1.0229, time 528.31ms, mfu 0.69%
iter 2680: loss 1.0507, time 526.99ms, mfu 0.70%
iter 2690: loss 1.0481, time 527.31ms, mfu 0.70%
iter 2700: loss 1.0228, time 528.42ms, mfu 0.70%
iter 2710: loss 1.0470, time 527.91ms, mfu 0.70%
iter 2720: loss 1.0383, time 528.00ms, mfu 0.70%
iter 2730: loss 1.0547, time 527.59ms, mfu 0.70%
iter 2740: loss 1.0168, time 528.69ms, mfu 0.70%
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iter 2740: loss 1.0168, time 528.09ms, mfu 0.70%
step 2750: train loss 0.9126, val loss 1.5167
iter 2750: loss 1.0390, time 74836.33ms, mfu 0.63%
iter 2760: loss 1.0322, time 526.38ms, mfu 0.64%
iter 2770: loss 1.0277, time 526.21ms, mfu 0.65%
iter 2780: loss 1.0257, time 525.90ms, mfu 0.65%
iter 2790: loss 1.0345, time 527.04ms, mfu 0.66%
iter 2800: loss 1.0121, time 527.84ms, mfu 0.66%
iter 2810: loss 1.0404, time 527.21ms, mfu 0.67%
iter 2820: loss 1.0232, time 527.88ms, mfu 0.67%
iter 2830: loss 1.0233, time 525.63ms, mfu 0.67%
iter 2840: loss 0.9875, time 526.77ms, mfu 0.68%
iter 2850: loss 1.0264, time 528.04ms, mfu 0.68%
iter 2860: loss 1.0144, time 528.77ms, mfu 0.68%
iter 2870: loss 1.0071, time 527.28ms, mfu 0.69%
iter 2880: loss 1.0320, time 528.64ms, mfu 0.69%
iter 2890: loss 1.0060, time 528.02ms, mfu 0.69%
iter 2900: loss 0.9901, time 527.03ms, mfu 0.69%
iter 2910: loss 1.0350, time 529.29ms, mfu 0.69%
iter 2920: loss 1.0090, time 527.85ms, mfu 0.69%
iter 2930: loss 0.9903, time 528.06ms, mfu 0.69%
iter 2940: loss 0.9862, time 527.42ms, mfu 0.70%
iter 2950: loss 1.0284, time 527.79ms, mfu 0.70%
iter 2960: loss 1.0035, time 526.48ms, mfu 0.70%
iter 2970: loss 0.9926, time 526.22ms, mfu 0.70%
iter 2980: loss 0.9981, time 525.10ms, mfu 0.70%
iter 2990: loss 0.9831, time 527.89ms, mfu 0.70%
step 3000: train loss 0.8664, val loss 1.5314
iter 3000: loss 0.9835, time 74829.04ms, mfu 0.63%
iter 3010: loss 0.9924, time 528.68ms, mfu 0.64%
iter 3020: loss 1.0058, time 527.47ms, mfu 0.65%
iter 3030: loss 1.0041, time 529.14ms, mfu 0.65%
iter 3040: loss 1.0294, time 527.14ms, mfu 0.66%
iter 3050: loss 0.9750, time 527.36ms, mfu 0.66%
iter 3060: loss 0.9981, time 526.41ms, mfu 0.67%
iter 3070: loss 1.0173, time 529.39ms, mfu 0.67%
iter 3080: loss 0.9948, time 526.57ms, mfu 0.67%
iter 3090: loss 0.9845, time 527.04ms, mfu 0.68%
iter 3100: loss 1.0023, time 527.07ms, mfu 0.68%
iter 3110: loss 0.9691, time 526.55ms, mfu 0.68%
iter 3120: loss 0.9939, time 526.29ms, mfu 0.69%
iter 3130: loss 0.9874, time 527.36ms, mfu 0.69%
iter 3140: loss 0.9783, time 527.45ms, mfu 0.69%
iter 3150: loss 0.9892, time 527.45ms, mfu 0.69%
iter 3160: loss 1.0131, time 529.32ms, mfu 0.69%
iter 3170: loss 0.9670, time 527.72ms, mfu 0.69%
iter 3180: loss 0.9737, time 528.88ms, mfu 0.69%
iter 3190: loss 0.9911, time 527.38ms, mfu 0.70%
iter 3200: loss 0.9663, time 525.67ms, mfu 0.70%
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iter 3210: loss 0.9650, time 525.72ms, mfu 0.70%
iter 3220: loss 0.9515, time 527.42ms, mfu 0.70%
iter 3230: loss 0.9562, time 528.73ms, mfu 0.70%
iter 3240: loss 0.9497, time 528.88ms, mfu 0.70%
step 3250: train loss 0.8214, val loss 1.5658
iter 3250: loss 0.9667, time 74766.04ms, mfu 0.63%
iter 3260: loss 0.9585, time 527.90ms, mfu 0.64%
iter 3270: loss 0.9728, time 526.61ms, mfu 0.65%
iter 3280: loss 0.9509, time 527.08ms, mfu 0.65%
iter 3290: loss 0.9470, time 528.27ms, mfu 0.66%
iter 3300: loss 0.9409, time 527.02ms, mfu 0.66%
iter 3310: loss 0.9521, time 526.69ms, mfu 0.67%
iter 3320: loss 0.9651, time 528.10ms, mfu 0.67%
iter 3330: loss 0.9629, time 527.58ms, mfu 0.67%
iter 3340: loss 0.9544, time 526.28ms, mfu 0.68%
iter 3350: loss 0.9581, time 528.32ms, mfu 0.68%
iter 3360: loss 0.9250, time 527.66ms, mfu 0.68%
iter 3370: loss 0.9618, time 529.23ms, mfu 0.68%
iter 3380: loss 0.9395, time 525.03ms, mfu 0.69%
iter 3390: loss 0.9500, time 526.71ms, mfu 0.69%
iter 3400: loss 0.9586, time 528.43ms, mfu 0.69%
iter 3410: loss 0.9375, time 529.09ms, mfu 0.69%
iter 3420: loss 0.9480, time 529.10ms, mfu 0.69%
iter 3430: loss 0.9439, time 527.79ms, mfu 0.69%
iter 3440: loss 0.9705, time 527.51ms, mfu 0.70%
iter 3450: loss 0.9469, time 527.55ms, mfu 0.70%
iter 3460: loss 0.9396, time 526.53ms, mfu 0.70%
iter 3470: loss 0.9445, time 528.01ms, mfu 0.70%
iter 3480: loss 0.9549, time 527.77ms, mfu 0.70%
iter 3490: loss 0.9161, time 527.55ms, mfu 0.70%
step 3500: train loss 0.7784, val loss 1.5784
iter 3500: loss 0.8996, time 74794.58ms, mfu 0.63%
iter 3510: loss 0.9173, time 528.47ms, mfu 0.64%
iter 3520: loss 0.9231, time 526.44ms, mfu 0.65%
iter 3530: loss 0.9523, time 527.47ms, mfu 0.65%
iter 3540: loss 0.9297, time 525.69ms, mfu 0.66%
iter 3550: loss 0.9277, time 526.73ms, mfu 0.66%
iter 3560: loss 0.9519, time 527.48ms, mfu 0.67%
iter 3570: loss 0.9348, time 528.81ms, mfu 0.67%
iter 3580: loss 0.9352, time 525.91ms, mfu 0.67%
iter 3590: loss 0.9228, time 527.24ms, mfu 0.68%
iter 3600: loss 0.9247, time 528.35ms, mfu 0.68%
iter 3610: loss 0.9158, time 528.06ms, mfu 0.68%
iter 3620: loss 0.9081, time 528.19ms, mfu 0.68%
iter 3630: loss 0.9248, time 528.43ms, mfu 0.69%
iter 3640: loss 0.9096, time 527.92ms, mfu 0.69%
iter 3650: loss 0.9084, time 528.16ms, mfu 0.69%
iter 3660: loss 0.9387, time 528.95ms, mfu 0.69%
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iter 3670: loss 0.9388, time 529.66ms, mfu 0.69%
iter 3680: loss 0.9101, time 527.86ms, mfu 0.69%
iter 3690: loss 0.9351, time 528.69ms, mfu 0.70%
iter 3700: loss 0.8688, time 527.34ms, mfu 0.70%
iter 3710: loss 0.8783, time 530.14ms, mfu 0.70%
iter 3720: loss 0.9033, time 527.22ms, mfu 0.70%
iter 3730: loss 0.9000, time 530.55ms, mfu 0.70%
iter 3740: loss 0.8988, time 529.11ms, mfu 0.70%
step 3750: train loss 0.7395, val loss 1.6072
iter 3750: loss 0.8959, time 74889.32ms, mfu 0.63%
iter 3760: loss 0.9352, time 529.67ms, mfu 0.64%
iter 3770: loss 0.9376, time 530.33ms, mfu 0.64%
iter 3780: loss 0.9199, time 527.69ms, mfu 0.65%
iter 3790: loss 0.8934, time 526.65ms, mfu 0.66%
iter 3800: loss 0.9090, time 527.97ms, mfu 0.66%
iter 3810: loss 0.9140, time 527.41ms, mfu 0.67%
iter 3820: loss 0.8880, time 528.20ms, mfu 0.67%
iter 3830: loss 0.8966, time 527.96ms, mfu 0.67%
iter 3840: loss 0.8876, time 527.89ms, mfu 0.68%
iter 3850: loss 0.8853, time 527.26ms, mfu 0.68%
iter 3860: loss 0.8690, time 528.68ms, mfu 0.68%
iter 3870: loss 0.8947, time 527.72ms, mfu 0.68%
iter 3880: loss 0.8859, time 526.13ms, mfu 0.69%
iter 3890: loss 0.8923, time 528.43ms, mfu 0.69%
iter 3900: loss 0.8904, time 527.67ms, mfu 0.69%
iter 3910: loss 0.8876, time 527.81ms, mfu 0.69%
iter 3920: loss 0.8658, time 527.88ms, mfu 0.69%
iter 3930: loss 0.8908, time 526.84ms, mfu 0.69%
iter 3940: loss 0.8776, time 527.06ms, mfu 0.70%
iter 3950: loss 0.8833, time 527.99ms, mfu 0.70%
iter 3960: loss 0.9065, time 527.33ms, mfu 0.70%
iter 3970: loss 0.8926, time 527.62ms, mfu 0.70%
iter 3980: loss 0.8919, time 526.03ms, mfu 0.70%
iter 3990: loss 0.8733, time 527.25ms, mfu 0.70%
step 4000: train loss 0.7062, val loss 1.6336
iter 4000: loss 0.8601, time 74635.73ms, mfu 0.63%
iter 4010: loss 0.8771, time 526.81ms, mfu 0.64%
iter 4020: loss 0.8902, time 525.00ms, mfu 0.65%
iter 4030: loss 0.8811, time 525.42ms, mfu 0.65%
iter 4040: loss 0.8803, time 525.73ms, mfu 0.66%
iter 4050: loss 0.8682, time 527.90ms, mfu 0.66%
iter 4060: loss 0.8670, time 527.57ms, mfu 0.67%
iter 4070: loss 0.8515, time 526.80ms, mfu 0.67%
iter 4080: loss 0.8877, time 525.02ms, mfu 0.67%
iter 4090: loss 0.8421, time 526.73ms, mfu 0.68%
iter 4100: loss 0.8956, time 524.86ms, mfu 0.68%
iter 4110: loss 0.8752, time 525.84ms, mfu 0.68%
iter 4120: loss 0.8815, time 525.22ms, mfu 0.69%
```

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iter 4130: loss 0.8578, time 526.35ms, mfu 0.69%
iter 4140: loss 0.8778, time 527.22ms, mfu 0.69%
iter 4150: loss 0.8662, time 527.55ms, mfu 0.69%
iter 4160: loss 0.8597, time 527.21ms, mfu 0.69%
iter 4170: loss 0.8723, time 523.75ms, mfu 0.70%
iter 4180: loss 0.8713, time 524.17ms, mfu 0.70%
iter 4190: loss 0.8739, time 525.39ms, mfu 0.70%
iter 4200: loss 0.8587, time 527.37ms, mfu 0.70%
iter 4210: loss 0.8669, time 526.47ms, mfu 0.70%
iter 4220: loss 0.8572, time 526.55ms, mfu 0.70%
iter 4230: loss 0.8771, time 525.85ms, mfu 0.70%
iter 4240: loss 0.8635, time 528.77ms, mfu 0.70%
step 4250: train loss 0.6776, val loss 1.6560
iter 4250: loss 0.8686, time 74724.88ms, mfu 0.63%
iter 4260: loss 0.8603, time 526.96ms, mfu 0.64%
iter 4270: loss 0.8625, time 527.74ms, mfu 0.65%
iter 4280: loss 0.8573, time 526.49ms, mfu 0.65%
iter 4290: loss 0.8313, time 525.96ms, mfu 0.66%
iter 4300: loss 0.8227, time 527.72ms, mfu 0.66%
iter 4310: loss 0.8470, time 527.80ms, mfu 0.67%
iter 4320: loss 0.8359, time 527.53ms, mfu 0.67%
iter 4330: loss 0.8571, time 527.31ms, mfu 0.67%
iter 4340: loss 0.8316, time 529.55ms, mfu 0.68%
iter 4350: loss 0.8394, time 527.66ms, mfu 0.68%
iter 4360: loss 0.8504, time 526.19ms, mfu 0.68%
iter 4370: loss 0.8527, time 526.25ms, mfu 0.69%
iter 4380: loss 0.8333, time 527.18ms, mfu 0.69%
iter 4390: loss 0.8641, time 526.12ms, mfu 0.69%
iter 4400: loss 0.8411, time 526.70ms, mfu 0.69%
iter 4410: loss 0.8611, time 528.61ms, mfu 0.69%
iter 4420: loss 0.8723, time 530.00ms, mfu 0.69%
iter 4430: loss 0.8490, time 528.61ms, mfu 0.70%
iter 4440: loss 0.8564, time 528.77ms, mfu 0.70%
iter 4450: loss 0.8425, time 527.59ms, mfu 0.70%
iter 4460: loss 0.8305, time 529.93ms, mfu 0.70%
iter 4470: loss 0.8549, time 527.40ms, mfu 0.70%
iter 4480: loss 0.8381, time 526.45ms, mfu 0.70%
iter 4490: loss 0.8393, time 527.65ms, mfu 0.70%
step 4500: train loss 0.6517, val loss 1.6735
iter 4500: loss 0.8571, time 74742.32ms, mfu 0.63%
iter 4510: loss 0.8488, time 526.38ms, mfu 0.64%
iter 4520: loss 0.8330, time 526.68ms, mfu 0.65%
iter 4530: loss 0.8458, time 530.70ms, mfu 0.65%
iter 4540: loss 0.8463, time 527.95ms, mfu 0.66%
iter 4550: loss 0.8774, time 527.32ms, mfu 0.66%
iter 4560: loss 0.8378, time 527.91ms, mfu 0.67%
iter 4570: loss 0.8397, time 526.53ms, mfu 0.67%
iter 4580: loss 0.8508, time 527.05ms, mfu 0.67%
iter 4590: loss 0.8508, time 527.62ms, mfu 0.68%
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iter 4590: loss 0.8508, time 527.62ms, mfu 0.68%
iter 4600: loss 0.8350, time 528.47ms, mfu 0.68%
iter 4610: loss 0.8740, time 528.39ms, mfu 0.68%
iter 4620: loss 0.8351, time 529.11ms, mfu 0.68%
iter 4630: loss 0.8250, time 527.95ms, mfu 0.69%
iter 4640: loss 0.8364, time 528.54ms, mfu 0.69%
iter 4650: loss 0.8563, time 528.40ms, mfu 0.69%
iter 4660: loss 0.8477, time 528.39ms, mfu 0.69%
iter 4670: loss 0.8341, time 526.84ms, mfu 0.69%
iter 4680: loss 0.8501, time 527.12ms, mfu 0.69%
iter 4690: loss 0.8521, time 525.93ms, mfu 0.70%
iter 4700: loss 0.8243, time 527.80ms, mfu 0.70%
iter 4710: loss 0.7913, time 528.64ms, mfu 0.70%
iter 4720: loss 0.8323, time 528.43ms, mfu 0.70%
iter 4730: loss 0.8126, time 525.85ms, mfu 0.70%
iter 4740: loss 0.8283, time 527.19ms, mfu 0.70%
step 4750: train loss 0.6337, val loss 1.6938
iter 4750: loss 0.7967, time 74746.66ms, mfu 0.63%
iter 4760: loss 0.8125, time 527.79ms, mfu 0.64%
iter 4770: loss 0.8011, time 526.71ms, mfu 0.65%
iter 4780: loss 0.8087, time 528.66ms, mfu 0.65%
iter 4790: loss 0.8405, time 529.27ms, mfu 0.66%
iter 4800: loss 0.8299, time 528.24ms, mfu 0.66%
iter 4810: loss 0.8391, time 525.81ms, mfu 0.67%
iter 4820: loss 0.8200, time 527.12ms, mfu 0.67%
iter 4830: loss 0.8243, time 528.12ms, mfu 0.67%
iter 4840: loss 0.8335, time 525.61ms, mfu 0.68%
iter 4850: loss 0.8148, time 527.84ms, mfu 0.68%
iter 4860: loss 0.8190, time 527.25ms, mfu 0.68%
iter 4870: loss 0.8079, time 527.06ms, mfu 0.69%
iter 4880: loss 0.8379, time 529.25ms, mfu 0.69%
iter 4890: loss 0.8022, time 529.44ms, mfu 0.69%
iter 4900: loss 0.8047, time 529.15ms, mfu 0.69%
iter 4910: loss 0.8247, time 526.71ms, mfu 0.69%
iter 4920: loss 0.8233, time 529.00ms, mfu 0.69%
iter 4930: loss 0.8128, time 526.70ms, mfu 0.69%
iter 4940: loss 0.8081, time 527.27ms, mfu 0.70%
iter 4950: loss 0.8254, time 526.69ms, mfu 0.70%
iter 4960: loss 0.8310, time 526.98ms, mfu 0.70%
iter 4970: loss 0.7889, time 526.10ms, mfu 0.70%
iter 4980: loss 0.8010, time 527.94ms, mfu 0.70%
iter 4990: loss 0.8295, time 527.37ms, mfu 0.70%
step 5000: train loss 0.6197, val loss 1.7098
iter 5000: loss 0.8210, time 74736.81ms, mfu 0.63%
"""
# 2. This code will automatically find the data and plot it. No changes needed b

# Regex to find all lines with step, train loss, and validation loss
pattern = re.compile(r"step (\d+): train loss ([\d.]+), val loss ([\d.]+)")
```

```
# Find all matches in the pasted log data
matches = pattern.findall(log_data)

if not matches:
    print("Could not find any loss data in the text you pasted.")
    print("Please make sure you copied the entire output, including lines like '
else:
    # Extract the data into separate lists, converting them to numbers
    steps = [int(match[0]) for match in matches]
    train_losses = [float(match[1]) for match in matches]
    val_losses = [float(match[2]) for match in matches]

    # --- Plotting ---
    plt.style.use('seaborn-v0_8-whitegrid') # Makes the plot look nice
    fig, ax = plt.subplots(figsize=(10, 6))

    # Plot training and validation loss
    ax.plot(steps, train_losses, 'o-', label='Training Loss', color='blue', lw=2
    ax.plot(steps, val_losses, 'o-', label='Validation Loss', color='orange', lw

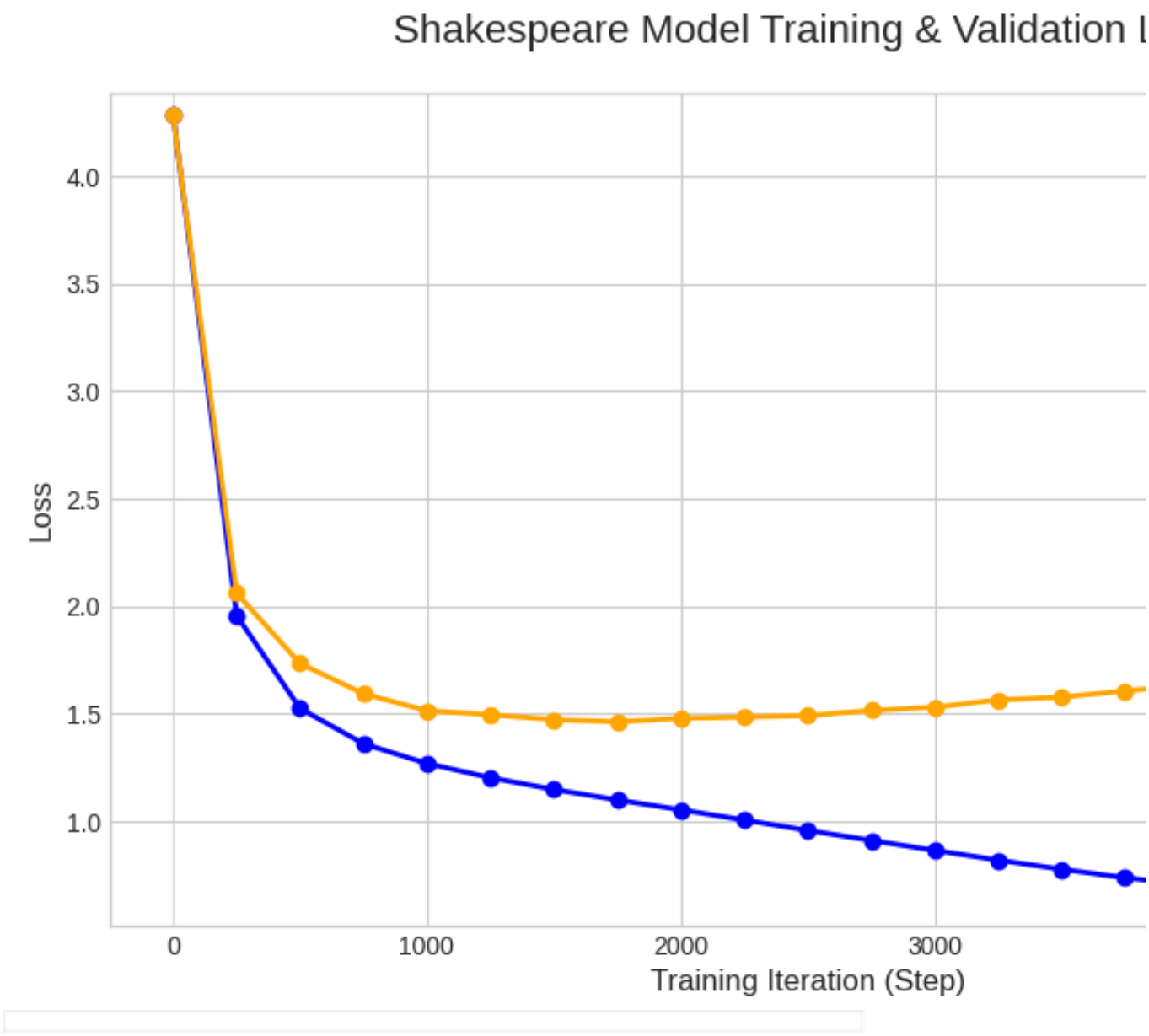
    # Adding titles and labels for clarity
    ax.set_title('Shakespeare Model Training & Validation Loss', fontsize=16, pa
    ax.set_xlabel('Training Iteration (Step)', fontsize=12)
    ax.set_ylabel('Loss', fontsize=12)
    ax.legend(fontsize=10)

    # Ensure the y-axis starts a bit above the minimum loss to see the curve bet
    min_loss = min(min(train_losses), min(val_losses))
    ax.set_ylim(min_loss - 0.1, max(train_losses[0], val_losses[0]) + 0.1)

    # Save the figure to a file
    output_filename = 'shakespeare_loss_curves.png'
    plt.savefig(output_filename, dpi=150)

    print(f"✅ Plot saved successfully as '{output_filename}'")
    plt.show()
```

```
✅ Plot saved successfully as 'shakespeare_loss_curves.png'
```



Start coding or generate with AI.