```
pip install transformers[torch] datasets
```

```
Requirement already satisfied: datasets in /usr/local/lib/python3.12/dist-packages (4.0.0)
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Requirement already satisfied: propcache>=0.2.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp!=4.0.0a0,!=4.0.0a
```

```
import torch
from transformers import GPT2Tokenizer, GPT2LMHeadModel, Trainer, TrainingArguments, TextDataset, DataCollatorForLanguageMod

model_name = "gpt2"
tokenizer = GPT2Tokenizer.from_pretrained(model_name)
model = GPT2LMHeadModel.from_pretrained(model_name)

with open("train.txt", "w") as f:
    for _ in range(100):
        f.write("Artificial intelligence is transforming the world.\n")
        f.write("GPT-2 is a powerful transformer model for text generation.\n")
        f.write("Fine-tuning allows models to learn specific styles and structures.\n")

def load_dataset(file_path, tokenizer, block_size=128):
    dataset = TextDataset(
        tokenizer=tokenizer,
        file_path=file_path,
        block_size=block_size,
    )
    return dataset

train_dataset = load_dataset("train.txt", tokenizer)
data_collator = DataCollatorForLanguageModeling(tokenizer=tokenizer, mlm=False)

training_args = TrainingArguments(
```

```python
training_args = TrainingArguments(
    output_dir="./gpt2-finetuned",
    overwrite_output_dir=True,
    num_train_epochs=3,
    per_device_train_batch_size=4,
    save_steps=100,
    logging_steps=10,
)

trainer = Trainer(
    model=model,
    args=training_args,
    data_collator=data_collator,
    train_dataset=train_dataset,
)

print("Starting Training...")
trainer.train()

model.save_pretrained("./gpt2-finetuned")
tokenizer.save_pretrained("./gpt2-finetuned")

def generate_text(prompt, max_length=50):
    device = "cuda" if torch.cuda.is_available() else "cpu"
    model.to(device)

    input_ids = tokenizer.encode(prompt, return_tensors='pt').to(device)

    output = model.generate(
        input_ids,
        max_length=max_length,
        num_return_sequences=1,
        no_repeat_ngram_size=2,
        do_sample=True,
        top_k=50,
        top_p=0.95,
        temperature=0.7
    )

    return tokenizer.decode(output[0], skip_special_tokens=True)

print("\n--- Generated Text ---")
prompt = "The future of AI"
generated_output = generate_text(prompt)
print(generated_output)
```

```
Map (num_proc=4): 100%                          3000/3000 [00:00<00:00, 1339.01 examples/s]

Map (num_proc=4): 100%                          3000/3000 [00:00<00:00, 1844.76 examples/s]

Starting Training...
/usr/local/lib/python3.12/dist-packages/notebook/notebookapp.py:191: SyntaxWarning: invalid escape sequence '\/'
  | |_| | '_ \/ _` / _` |  _/ -_)
wandb: (1) Create a W&B account
wandb: (2) Use an existing W&B account
wandb: (3) Don't visualize my results
wandb: Enter your choice: 2
wandb: You chose 'Use an existing W&B account'
wandb: Logging into https://api.wandb.ai. (Learn how to deploy a W&B server locally: https://wandb.me/wandb-server)
wandb: Find your API key here: https://wandb.ai/authorize?ref=models
wandb: Paste an API key from your profile and hit enter: ··········
wandb: No netrc file found, creating one.
wandb: Appending key for api.wandb.ai to your netrc file: /root/.netrc
wandb: Currently logged in as: dishagandhi809 (dishagandhi809-prodigy-information-technologies) to https://api.wandb.ai. U
Tracking run with wandb version 0.24.0
Run data is saved locally in /content/wandb/run-20260128_164321-n4fr9rmc
Syncing run soft-oath-3 to Weights & Biases (docs)
View project at https://wandb.ai/dishagandhi809-prodigy-information-technologies/huggingface
View run at https://wandb.ai/dishagandhi809-prodigy-information-technologies/huggingface/runs/n4fr9rmc
`loss_type=None` was set in the config but it is unrecognized. Using the default loss: `ForCausalLMLoss`.
                                            [198/198 00:39, Epoch 3/3]
```

Step	Training Loss
10	0.812000
20	0.112800

Start coding or generate with AI.

40	0.030600
50	0.032800
60	0.024900
70	0.017200
80	0.015700
90	0.021000
100	0.016800
110	0.019900
120	0.010700
130	0.012800
140	0.013700
150	0.021300
160	0.010300