

```
In [1]: pip install notebook
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Requirement already satisfied: notebook in c:\users\nelso\anaconda3\lib\site-packages (7.2.2)
Requirement already satisfied: jupyter-server<3,>=2.4.0 in c:\users\nelso\anaconda3\lib\site-packages (from notebook) (2.14.1)
Requirement already satisfied: jupyterlab-server<3,>=2.27.1 in c:\users\nelso\anaconda3\lib\site-packages (from notebook) (2.27.3)
Requirement already satisfied: jupyterlab<4.3,>=4.2.0 in c:\users\nelso\anaconda3\lib\site-packages (from notebook) (4.2.5)
Requirement already satisfied: notebook-shim<0.3,>=0.2 in c:\users\nelso\anaconda3\lib\site-packages (from notebook) (0.2.3)
Requirement already satisfied: tornado>=6.2.0 in c:\users\nelso\anaconda3\lib\site-packages (from notebook) (6.4.1)
Requirement already satisfied: anyio>=3.1.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (4.2.0)
Requirement already satisfied: argon2-cffi>=21.1 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (21.3.0)
Requirement already satisfied: Jinja2>=3.0.3 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (3.1.4)
Requirement already satisfied: jupyter-client>=7.4.4 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (8.6.0)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (5.7.2)
Requirement already satisfied: jupyter-events>=0.9.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (0.10.0)
Requirement already satisfied: jupyter-server-terminals>=0.4.4 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (0.4.4)
Requirement already satisfied: nbconvert>=6.4.4 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (7.16.4)
Requirement already satisfied: nbformat>=5.3.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (5.10.4)
Requirement already satisfied: overrides>=5.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (7.4.0)
Requirement already satisfied: packaging>=22.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (24.1)
Requirement already satisfied: prometheus-client>=0.9 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (0.14.1)
Requirement already satisfied: pywinpty>=2.0.1 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (2.0.10)
Requirement already satisfied: pyzmq>=24 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (25.1.2)
Requirement already satisfied: send2trash>=1.8.2 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (1.8.2)
Requirement already satisfied: terminado>=0.8.3 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (0.17.1)
Requirement already satisfied: traitlets>=5.6.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (5.14.3)
Requirement already satisfied: websocket-client>=1.7 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-server<3,>=2.4.0->notebook) (1.8.0)
Requirement already satisfied: async-lru>=1.0.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab<4.3,>=4.2.0->notebook) (2.0.4)
Requirement already satisfied: httpx>=0.25.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab<4.3,>=4.2.0->notebook) (0.27.0)
Requirement already satisfied: ipykernel>=6.5.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab<4.3,>=4.2.0->notebook) (6.28.0)
Requirement already satisfied: jupyter-lsp>=2.0.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab<4.3,>=4.2.0->notebook) (2.2.0)
Requirement already satisfied: setuptools>=40.1.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab<4.3,>=4.2.0->notebook) (75.1.0)
Requirement already satisfied: babel>=2.10 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab-server<3,>=2.27.1->notebook) (2.11.0)
Requirement already satisfied: json5>=0.9.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab-server<3,>=2.27.1->notebook) (0.9.6)
Requirement already satisfied: jsonschema>=4.18.0 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab-server<3,>=2.27.1->notebook) (4.23.0)
Requirement already satisfied: requests>=2.31 in c:\users\nelso\anaconda3\lib\site-packages (from jupyterlab-server<3,>=2.27.1->notebook) (2.32.3)
Requirement already satisfied: idna>=2.8 in c:\users\nelso\anaconda3\lib\site-packages (from anyio>=3.1.0->jupyter-server<3,>=2.4.0->notebook) (3.7)
Requirement already satisfied: sniffio>=1.1 in c:\users\nelso\anaconda3\lib\site-packages (from anyio>=3.1.0->jupyter-server<3,>=2.4.0->notebook) (1.3.0)
Requirement already satisfied: argon2-cffi-bindings in c:\users\nelso\anaconda3\lib\site-packages (from argon2-cffi>=21.1->jupyter-server<3,>=2.4.0->notebook) (21.2.0)
Requirement already satisfied: pytz>=2015.7 in c:\users\nelso\anaconda3\lib\site-packages (from babel>=2.10->jupyterlab-server<3,>=2.27.1->notebook) (2024.1)
Requirement already satisfied: certifi in c:\users\nelso\anaconda3\lib\site-packages (from httpx>=0.25.0->jupyterlab<4.3,>=4.2.0->notebook) (2025.1.31)
Requirement already satisfied: httpcore==1.* in c:\users\nelso\anaconda3\lib\site-packages (from httpx>=0.25.0->jupyterlab<4.3,>=4.2.0->notebook) (1.0.2)
Requirement already satisfied: h11<0.15,>=0.13 in c:\users\nelso\anaconda3\lib\site-packages (from httpcore==1.*->httpx>=0.25.0->jupyterlab<4.3,>=4.2.0->notebook) (0.14.0)
Requirement already satisfied: comm>=0.1.1 in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0-
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>jupyterlab<4.3,>=4.2.0->notebook) (0.2.1)  
Requirement already satisfied: debugpy>=1.6.5 in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (1.6.7)  
Requirement already satisfied: ipython>=7.23.1 in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (8.27.0)  
Requirement already satisfied: matplotlib-inline>=0.1 in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.1.6)  
Requirement already satisfied: nest-asyncio in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (1.6.0)  
Requirement already satisfied: psutil in c:\users\nelso\anaconda3\lib\site-packages (from ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (5.9.0)  
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\nelso\anaconda3\lib\site-packages (from jinja2>=3.0.3->jupyter-server<3,>=2.4.0->notebook) (2.1.3)  
Requirement already satisfied: attrs>=22.2.0 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->notebook) (23.1.0)  
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->notebook) (2023.7.1)  
Requirement already satisfied: referencing>=0.28.4 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->notebook) (0.30.2)  
Requirement already satisfied: rpds-py>=0.7.1 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->notebook) (0.10.6)  
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-client>=7.4.4->jupyter-server<3,>=2.4.0->notebook) (2.9.0.post0)  
Requirement already satisfied: platformdirs>=2.5 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-core!=5.0.\*,>=4.12->jupyter-server<3,>=2.4.0->notebook) (3.10.0)  
Requirement already satisfied: pywin32>=300 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-core!=5.0.\*,>=4.12->jupyter-server<3,>=2.4.0->notebook) (305.1)  
Requirement already satisfied: python-json-logger>=2.0.4 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (2.0.7)  
Requirement already satisfied: pyyaml>=5.3 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (6.0.1)  
Requirement already satisfied: rfc3339-validator in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (0.1.4)  
Requirement already satisfied: rfc3986-validator>=0.1.1 in c:\users\nelso\anaconda3\lib\site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (0.1.1)  
Requirement already satisfied: beautifulsoup4 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (4.12.3)  
Requirement already satisfied: bleach!=5.0.0 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (4.1.0)  
Requirement already satisfied: defusedxml in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (0.7.1)  
Requirement already satisfied: jupyterlab-pygments in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (0.1.2)  
Requirement already satisfied: mistune<4,>=2.0.3 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (2.0.4)  
Requirement already satisfied: nbclient>=0.5.0 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (0.8.0)  
Requirement already satisfied: pandocfilters>=1.4.1 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (1.5.0)  
Requirement already satisfied: pygments>=2.4.1 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (2.15.1)  
Requirement already satisfied: tinycss2 in c:\users\nelso\anaconda3\lib\site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (1.2.1)  
Requirement already satisfied: fastjsonschema>=2.15 in c:\users\nelso\anaconda3\lib\site-packages (from nbformat>=5.3.0->jupyter-server<3,>=2.4.0->notebook) (2.16.2)  
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\nelso\anaconda3\lib\site-packages (from requests>=2.31->jupyterlab-server<3,>=2.27.1->notebook) (3.3.2)  
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\nelso\anaconda3\lib\site-packages (from requests>=2.31->jupyterlab-server<3,>=2.27.1->notebook) (2.2.3)  
Requirement already satisfied: six>=1.9.0 in c:\users\nelso\anaconda3\lib\site-packages (from bleach!=5.0.0->nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (1.16.0)  
Requirement already satisfied: webencodings in c:\users\nelso\anaconda3\lib\site-packages (from bleach!=5.0.0->nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (0.5.1)  
Requirement already satisfied: decorator in c:\users\nelso\anaconda3\lib\site-packages (from ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (5.1.1)  
Requirement already satisfied: jedi>=0.16 in c:\users\nelso\anaconda3\lib\site-packages (from ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.19.1)  
Requirement already satisfied: prompt-toolkit<3.1.0,>=3.0.41 in c:\users\nelso\anaconda3\lib\site-packages (from ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (3.0.43)  
Requirement already satisfied: stack-data in c:\users\nelso\anaconda3\lib\site-packages (from ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.2.0)  
Requirement already satisfied: colorama in c:\users\nelso\anaconda3\lib\site-packages (from ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.4.6)  
Requirement already satisfied: fqdn in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (1.5.1)  
Requirement already satisfied: isoduration in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (20.11.0)  
Requirement already satisfied: jsonpointer>=1.13 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (2.1)  
Requirement already satisfied: uri-template in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (1.3.0)  
Requirement already satisfied: webcolors>=24.6.0 in c:\users\nelso\anaconda3\lib\site-packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (24.11.1)

Requirement already satisfied: cffi>=1.0.1 in c:\users\nelso\anaconda3\lib\site-packages (from argon2-cffi-bindings->argon2-cffi>=21.1->jupyter-server<3,>=2.4.0->notebook) (1.17.1)

Requirement already satisfied: soupsieve>1.2 in c:\users\nelso\anaconda3\lib\site-packages (from beautifulsoup4->nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->notebook) (2.5)

Requirement already satisfied: pycparser in c:\users\nelso\anaconda3\lib\site-packages (from cffi>=1.0.1->argon2-cffi-bindings->argon2-cffi>=21.1->jupyter-server<3,>=2.4.0->notebook) (2.21)

Requirement already satisfied: parso<0.9.0,>=0.8.3 in c:\users\nelso\anaconda3\lib\site-packages (from jedi>=0.16->ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.8.3)

Requirement already satisfied: wcwidth in c:\users\nelso\anaconda3\lib\site-packages (from prompt-toolkit<3.1.0,>=3.0.41->ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.2.5)

Requirement already satisfied: arrow>=0.15.0 in c:\users\nelso\anaconda3\lib\site-packages (from isoduration->jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->notebook) (1.2.3)

Requirement already satisfied: executing in c:\users\nelso\anaconda3\lib\site-packages (from stack-data->ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.8.3)

Requirement already satisfied: asttokens in c:\users\nelso\anaconda3\lib\site-packages (from stack-data->ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (2.0.5)

Requirement already satisfied: pure-eval in c:\users\nelso\anaconda3\lib\site-packages (from stack-data->ipython>=7.23.1->ipykernel>=6.5.0->jupyterlab<4.3,>=4.2.0->notebook) (0.2.2)

Note: you may need to restart the kernel to use updated packages.

In [2]: `!pip install torch transformers pandas`

Requirement already satisfied: torch in c:\users\nelso\anaconda3\lib\site-packages (2.7.0)

Requirement already satisfied: transformers in c:\users\nelso\anaconda3\lib\site-packages (4.51.3)

Requirement already satisfied: pandas in c:\users\nelso\anaconda3\lib\site-packages (2.2.2)

Requirement already satisfied: filelock in c:\users\nelso\anaconda3\lib\site-packages (from torch) (3.13.1)

Requirement already satisfied: typing-extensions>=4.10.0 in c:\users\nelso\anaconda3\lib\site-packages (from torch) (4.11.0)

Requirement already satisfied: sympy>=1.13.3 in c:\users\nelso\anaconda3\lib\site-packages (from torch) (1.13.3)

Requirement already satisfied: networkx in c:\users\nelso\anaconda3\lib\site-packages (from torch) (3.3)

Requirement already satisfied: jinja2 in c:\users\nelso\anaconda3\lib\site-packages (from torch) (3.1.4)

Requirement already satisfied: fsspec in c:\users\nelso\anaconda3\lib\site-packages (from torch) (2024.6.1)

Requirement already satisfied: setuptools in c:\users\nelso\anaconda3\lib\site-packages (from torch) (75.1.0)

Requirement already satisfied: huggingface-hub<1.0,>=0.30.0 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (0.30.2)

Requirement already satisfied: numpy>=1.17 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (1.26.4)

Requirement already satisfied: packaging>=20.0 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (24.1)

Requirement already satisfied: pyyaml>=5.1 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (6.0.1)

Requirement already satisfied: regex!=2019.12.17 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (2024.9.11)

Requirement already satisfied: requests in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (2.32.3)

Requirement already satisfied: tokenizers<0.22,>=0.21 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (0.21.1)

Requirement already satisfied: safetensors>=0.4.3 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (0.5.3)

Requirement already satisfied: tqdm>=4.27 in c:\users\nelso\anaconda3\lib\site-packages (from transformers) (4.66.5)

Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\nelso\anaconda3\lib\site-packages (from pandas) (2.9.0.post0)

Requirement already satisfied: pytz>=2020.1 in c:\users\nelso\anaconda3\lib\site-packages (from pandas) (2024.1)

Requirement already satisfied: tzdata>=2022.7 in c:\users\nelso\anaconda3\lib\site-packages (from pandas) (2023.3)

Requirement already satisfied: six>=1.5 in c:\users\nelso\anaconda3\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)

Requirement already satisfied: mpmath<1.4,>=1.1.0 in c:\users\nelso\anaconda3\lib\site-packages (from sympy>=1.13.3->torch) (1.3.0)

Requirement already satisfied: colorama in c:\users\nelso\anaconda3\lib\site-packages (from tqdm>=4.27->transformers) (0.4.6)

Requirement already satisfied: MarkupSafe>=2.0 in c:\users\nelso\anaconda3\lib\site-packages (from jinja2->torch) (2.1.3)

Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\nelso\anaconda3\lib\site-packages (from requests->transformers) (3.3.2)

Requirement already satisfied: idna<4,>=2.5 in c:\users\nelso\anaconda3\lib\site-packages (from requests->transformers) (3.7)

Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\nelso\anaconda3\lib\site-packages (from requests->transformers) (2.2.3)

Requirement already satisfied: certifi>=2017.4.17 in c:\users\nelso\anaconda3\lib\site-packages (from requests->transformers) (2025.1.31)

In [12]: `import os`

```
file_path = 'data/ids-sst-train.csv'
if os.path.exists(file_path):
    print("File exists")
else:
    print("File not found")
```

File not found

In [18]: `import torch`

```

from transformers import BertModel

class minBERTModel(torch.nn.Module):
    def __init__(self):
        super(minBERTModel, self).__init__()
        self.bert = BertModel.from_pretrained('bert-base-uncased')
        self.dropout = torch.nn.Dropout(0.1)
        self.classifier = torch.nn.Linear(768, 5) # Assuming 5 sentiment classes

    def forward(self, input_ids, attention_mask):
        outputs = self.bert(input_ids, attention_mask=attention_mask)
        pooled_output = outputs[1]
        pooled_output = self.dropout(pooled_output)
        return self.classifier(pooled_output)

```

```

In [22]: from torch.utils.data import DataLoader, Dataset
from transformers import AdamW

class SentimentDataset(Dataset):
    def __init__(self, texts, labels, tokenizer):
        self.texts = texts
        self.labels = labels
        self.tokenizer = tokenizer

    def __len__(self):
        return len(self.texts)

    def __getitem__(self, idx):
        encoding = self.tokenizer.encode_plus(
            self.texts[idx],
            add_special_tokens=True,
            max_length=512,
            return_token_type_ids=False,
            padding='max_length',
            return_attention_mask=True,
            return_tensors='pt',
        )
        return {
            'text': self.texts[idx],
            'input_ids': encoding['input_ids'].flatten(),
            'attention_mask': encoding['attention_mask'].flatten(),
            'label': torch.tensor(self.labels[idx], dtype=torch.long)
        }

tokenizer = BertTokenizer.from_pretrained('bert-base-uncased')
train_dataset = SentimentDataset(sst_train['text'], sst_train['label'], tokenizer)
train_loader = DataLoader(train_dataset, batch_size=16, shuffle=True)

model = minBERTModel()
optimizer = AdamW(model.parameters(), lr=2e-5)

for epoch in range(3): # Number of epochs
    for batch in train_loader:
        optimizer.zero_grad()
        input_ids = batch['input_ids']
        attention_mask = batch['attention_mask']
        labels = batch['label']
        outputs = model(input_ids, attention_mask)
        loss = torch.nn.CrossEntropyLoss()(outputs, labels)
        loss.backward()
        optimizer.step()

```

```

Cell In[22], line 42
    labels = batch['label']
    ^

```

**IndentationError:** unexpected indent

```

In [26]: import pandas as pd
from transformers import BertTokenizer
import torch
from torch.utils.data import DataLoader, Dataset
from transformers import AdamW

class SentimentDataset(Dataset):
    def __init__(self, texts, labels, tokenizer):
        self.texts = texts
        self.labels = labels
        self.tokenizer = tokenizer

    def __len__(self):
        return len(self.texts)

    def __getitem__(self, idx):

```

```

        encoding = self.tokenizer.encode_plus(
            self.texts[idx],
            add_special_tokens=True,
            max_length=512,
            return_token_type_ids=False,
            padding='max_length',
            return_attention_mask=True,
            return_tensors='pt',
        )
    return {
        'text': self.texts[idx],
        'input_ids': encoding['input_ids'].flatten(),
        'attention_mask': encoding['attention_mask'].flatten(),
        'label': torch.tensor(self.labels[idx], dtype=torch.long)
    }

```

```
tokenizer = BertTokenizer.from_pretrained('bert-base-uncased')
```

-----  
**ImportError** Traceback (most recent call last)

```

Cell In[26], line 5
      3 import torch
      4 from torch.utils.data import DataLoader, Dataset
----> 5 from transformers import AdamW
      7 class SentimentDataset(Dataset):
      8     def __init__(self, texts, labels, tokenizer):

```

**ImportError:** cannot import name 'AdamW' from 'transformers' (C:\Users\nelso\anaconda3\Lib\site-packages\transformers\\_\_init\_\_.py)

```

In [28]: class minBERTModel(torch.nn.Module):
        def __init__(self):
            super(minBERTModel, self).__init__()
            self.bert = BertModel.from_pretrained('bert-base-uncased')
            self.dropout = torch.nn.Dropout(0.1)
            self.classifier = torch.nn.Linear(768, 5) # Assuming 5 sentiment classes

        def forward(self, input_ids, attention_mask):
            outputs = self.bert(input_ids, attention_mask=attention_mask)
            pooled_output = outputs[1]
            pooled_output = self.dropout(pooled_output)
            return self.classifier(pooled_output)

model = minBERTModel()
optimizer = AdamW(model.parameters(), lr=2e-5)

```

```
config.json: 0%| | 0.00/570 [00:00<?, ?B/s]
```

C:\Users\nelso\anaconda3\Lib\site-packages\huggingface\_hub\file\_download.py:144: UserWarning: `huggingface\_hub` cache-system uses symlinks by default to efficiently store duplicated files but your machine does not support them in C:\Users\nelso\.cache\huggingface\hub\models--bert-base-uncased. Caching files will still work but in a degraded version that might require more space on your disk. This warning can be disabled by setting the `HF\_HUB\_DISABLE\_SYMLINKS\_WARNING` environment variable. For more details, see [https://huggingface.co/docs/huggingface\\_hub/how-to-cache#limitations](https://huggingface.co/docs/huggingface_hub/how-to-cache#limitations).

To support symlinks on Windows, you either need to activate Developer Mode or to run Python as an administrator. In order to activate developer mode, see this article: <https://docs.microsoft.com/en-us/windows/apps/get-started/enable-your-device-for-development>

```
warnings.warn(message)
```

Xet Storage is enabled for this repo, but the 'hf\_xet' package is not installed. Falling back to regular HTTP download. For better performance, install the package with: `pip install huggingface\_hub[hf\_xet]` or `pip install hf\_xet`

```
model.safetensors: 0%| | 0.00/440M [00:00<?, ?B/s]
```

-----  
**NameError** Traceback (most recent call last)

```

Cell In[28], line 15
      12     return self.classifier(pooled_output)
      14 model = minBERTModel()
----> 15 optimizer = AdamW(model.parameters(), lr=2e-5)

```

**NameError:** name 'AdamW' is not defined

```

In [ ]: for epoch in range(3): # Number of epochs
        for batch in train_loader:
            optimizer.zero_grad()
            input_ids = batch['input_ids']
            attention_mask = batch['attention_mask']
            labels = batch['label']
            outputs = model(input_ids, attention_mask)
            loss = torch.nn.CrossEntropyLoss()(outputs, labels)
            loss.backward()
            optimizer.step()

```

```

In [31]: def evaluate(model, data_loader):
        model.eval()

```

```

correct_predictions = 0
with torch.no_grad():
    for batch in data_loader:
        input_ids = batch['input_ids']
        attention_mask = batch['attention_mask']
        labels = batch['label']
        outputs = model(input_ids, attention_mask)
        _, preds = torch.max(outputs, dim=1)
        correct_predictions += torch.sum(preds == labels)
    return correct_predictions.double() / len(data_loader.dataset)

dev_accuracy = evaluate(model, dev_loader)
test_accuracy = evaluate(model, test_loader)
print(f'Dev Accuracy: {dev_accuracy.item()}')
print(f'Test Accuracy: {test_accuracy.item()}')

```

```

-----
NameError                                Traceback (most recent call last)
Cell In[31], line 14
     11         correct_predictions += torch.sum(preds == labels)
     12     return correct_predictions.double() / len(data_loader.dataset)
--> 14 dev_accuracy = evaluate(model, dev_loader)
     15 test_accuracy = evaluate(model, test_loader)
     16 print(f'Dev Accuracy: {dev_accuracy.item()}')

NameError: name 'dev_loader' is not defined

```

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