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October 2, 2025

1 Homework 1

2 Natural Language Processing, CSCI-SHU376 Fall 2025

2.1 Due Oct 8th, 2025 at 11:59pm China Time

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Please submit the following items to Gradescope: * Your Colab notebook link (by clicking the Share button at the top-right corner of the Colab notebook, share to anyone). * The printout of your run in Colab notebook in pdf format

Note: * All solutions must be from your own work. * Total points of the assignment is 100.

3 Setup environment

```
[ ]: from google.colab import drive
     drive.mount('/content/drive')
```

Mounted at /content/drive

```
[ ]: # This makes your Google drive as the HOME directory in Colab
     %env HOME=/content/drive/My Drive/
     # This folder will be used to store your models and results
     !mkdir -p ~/Courses/nlp_fall2025/homework1/
     %cd ~/Courses/nlp_fall2025/homework1
```

env: HOME=/content/drive/My Drive/
/content/drive/My Drive/Courses/nlp_fall2025/homework1

```
[ ]: pip install nltk datasets
```

Requirement already satisfied: nltk in /usr/local/lib/python3.12/dist-packages
(3.9.1)
Requirement already satisfied: datasets in /usr/local/lib/python3.12/dist-
packages (4.0.0)
Requirement already satisfied: click in /usr/local/lib/python3.12/dist-packages
(from nltk) (8.2.1)
Requirement already satisfied: joblib in /usr/local/lib/python3.12/dist-packages

```
(from nltk) (1.5.2)
Requirement already satisfied: regex>=2021.8.3 in
/usr/local/lib/python3.12/dist-packages (from nltk) (2024.11.6)
Requirement already satisfied: tqdm in /usr/local/lib/python3.12/dist-packages
(from nltk) (4.67.1)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-
packages (from datasets) (3.19.1)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.12/dist-
packages (from datasets) (2.0.2)
Requirement already satisfied: pyarrow>=15.0.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (18.1.0)
Requirement already satisfied: dill<0.3.9,>=0.3.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.3.8)
Requirement already satisfied: pandas in /usr/local/lib/python3.12/dist-packages
(from datasets) (2.2.2)
Requirement already satisfied: requests>=2.32.2 in
/usr/local/lib/python3.12/dist-packages (from datasets) (2.32.4)
Requirement already satisfied: xxhash in /usr/local/lib/python3.12/dist-packages
(from datasets) (3.5.0)
Requirement already satisfied: multiprocess<0.70.17 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.70.16)
Requirement already satisfied: fsspec<=2025.3.0,>=2023.1.0 in
/usr/local/lib/python3.12/dist-packages (from
fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (2025.3.0)
Requirement already satisfied: huggingface-hub>=0.24.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.35.0)
Requirement already satisfied: packaging in /usr/local/lib/python3.12/dist-
packages (from datasets) (25.0)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.12/dist-
packages (from datasets) (6.0.2)
Requirement already satisfied: aiohttp!=4.0.0a0,!=4.0.0a1 in
/usr/local/lib/python3.12/dist-packages (from
fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (3.12.15)
Requirement already satisfied: typing-extensions>=3.7.4.3 in
/usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.24.0->datasets)
(4.15.0)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in
/usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.24.0->datasets)
(1.1.10)
Requirement already satisfied: charset_normalizer<4,>=2 in
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(3.4.3)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-
packages (from requests>=2.32.2->datasets) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in
```

```
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(2025.8.3)
Requirement already satisfied: python-dateutil>=2.8.2 in
/usr/local/lib/python3.12/dist-packages (from pandas->datasets) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.12/dist-
packages (from pandas->datasets) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.12/dist-
packages (from pandas->datasets) (2025.2)
Requirement already satisfied: aiohappyeyeballs>=2.5.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (2.6.1)
Requirement already satisfied: aiosignal>=1.4.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (1.4.0)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.12/dist-
packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets)
(25.3.0)
Requirement already satisfied: frozenlist>=1.1.1 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (1.7.0)
Requirement already satisfied: multidict<7.0,>=4.5 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (6.6.4)
Requirement already satisfied: propcache>=0.2.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (0.3.2)
Requirement already satisfied: yarl<2.0,>=1.17.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets)
(1.20.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.12/dist-
packages (from python-dateutil>=2.8.2->pandas->datasets) (1.17.0)
```

[ ]:

3.1   1. N-gram LM with Kneser-Ney smoothing [50 pts]

Kneser-Ney smoothing is a method to smooth the N-gram counts. The modified counts at N-gram order i (i.e. the continuation counts) are derived from the order i+1 counts in a recursive manner. Absolute discounting is applied to estimate probability distributions at each N-gram order. Backoff weights $\alpha(context)$ are computed so that summation of probability given *any* word context sums to 1.0. Please refer to the lecture slides / J&M book for details.

In this question, we assume that backing off to a unigram LM $P_{BO}(w)$ ends the recursive probability computation. This means that absolute discounting at unigram $P_{KN}(w)$ is not required, and its MLE estimate is simply the relative word frequency of the continuation counts, i.e., $\frac{C_{continuation}(w)}{\sum_{v \in V} C_{continuation}(v)}$. We also assume that unknown word token $< unk >$ is added into the LM

vocabulary V.

___a__. Implement `class KNLM`.

In this question, you will implement Kneser-Ney LM.

The Kneser-Ney LM `class KNLM` support the following functions: * Select the top-K vocabulary based on the `min_count` on the training data. If `min_count` is 1, all vocabulary will be selected from the training data. * Calculate raw N-gram counts from a dataset. * Calculate all lower-order continuation counts. * Estimate LM model parameters: discounted probability distributions and backoff weights for each N-gram order. * Calculate word perplexity on a dataset. * Generate random sentences using the LM.

All word tokens that are not in the selected vocabulary should be mapped to `<unk>`, the unknown word token.

3.1.1 Dataset

We use the datasets module from Huggingface to load the Penntree bank text data for LM experiment. Example of getting an iterable over sentences is shown in `class KNLM`.

3.1.2 Limited usage of NLTK

We allow using `nltk.ngrams` to compute the ngrams given a list of word tokens. But you are NOT allowed to use any other functions and data structures in nltk for this assignment.

3.1.3 Data structure

Please use the provided data structure to complete the task. We assume using the Python dictionaries to store the discounted probs and backoff weights, as provided in `class KNLM`.

Context: A tuple of strings

word: A string

order 1: unigram, order 2: bigram and so forth.

For example:

`self._prob[1][context=()][word="is"]` stores the absolute discounted probs P*("is") for unigram (N-gram order = 1).

`self._prob[2][context=("this",)][word="is"]` stores the absolute discounted probs P*("is"|"this") for bigrams (N-gram order = 2).

`self._bow[2][context=("this",)]` stores the backoff weight for the word context at N-gram order = 2.

`self._prob[3][context=("this","is",)][word="a"]` stores the absolute discounted probs P*("a"|"this is") for trigrams (N-gram order = 3).

`self._bow[3][context=("this", "is",)]` stores the backoff weight for the word context at N-gram order = 3.

We also provide a data structure to store the N-gram counts in `self.counters`.

Alternatively, you may also use other Python data structure as you see fit to store the LM parameters.

3.1.4 Correctness

All the estimated probabilities of *any* context must sum to 1.0. You may use `def check_lm()` and `def check_prob()` to check the correctness by trying out some word context at different N-gram orders. You should carefully check the validity of your LM.

```python
import datasets
from datasets import load_dataset
import nltk
nltk.download('punkt')
from collections import defaultdict
import math
import random

class SimpleTokenizer:
  def __init__(self):
    pass

  def tokenize(self, sentence):
    return sentence.strip().split()

class KNLM:
  def __init__(self, order, D, min_count, tokenizer):
    """
    order: integer. order = 1...N
    D: Absolute discounting factor 0 < D < 1
    min_count: at least 1
    tokenizer: tokenize a given sentence strin
    """
    self._bos = "<s>"
    self._eos = "</s>"
    self._unk = "<unk>"

    # set class variables
    self._order = order
    self._D = D
    self._min_count = min_count
    self._tokenizer = tokenizer

    # data structures for the LM
    # prob
    self._prob = [defaultdict(lambda: defaultdict(float)) for i in
   ↪range(order+1)]

    # backword weights alpha(context)
```

```python
    #defaultdict -
    #defaultdict(float) -    0.0
    self._bow = [defaultdict(float) for i in range(order+1)]

    # data structure to store the N-gram counts
    self._counters = [defaultdict(lambda: defaultdict(float)) for i in
↪range(order+1)]
    #   cont_counter:
    self._cont_counters = [defaultdict(lambda: defaultdict(int)) for _ in
↪range(order+1)]
    # vocabulary set
    self._vocab = set()

def print_counter(self, counter):
    """
    Debugging purpose: You may want to print the counters based on only a
↪handful of sentences
    and see if the computed counts are equal to the ones computed by hand.
    """
    for context in counter.keys():
        for word in counter[context].keys():
            print("{} {} {}".format(context, word, counter[context][word]))

def _select_vocab(self, dataset, min_count):
    """
    """
    counter = defaultdict(int)
    for sample in dataset:
        tokens = self._tokenizer.tokenize(sample['sentence'])
        for token in tokens:
            counter[token]+=1
    # TODO: Your code
    self._vocab.add(self._unk)
    self._vocab.add(self._bos)
    self._vocab.add(self._eos)
    for token, count in counter.items():
        if count >= min_count:
            self._vocab.add(token)

    print("Size of vocabulary is {}".format(len(self._vocab)))

def compute_count(self, dataset, order):
    """
    dataset: iterable yielding a dictionary object that has a field 'sentence'
    order: integer. order = 1...N
    counter is just a dictionary of a dictionary of a integer
    counter[context][word] stores the raw N-gram counts
```

```python
        """
        counter = defaultdict(lambda: defaultdict(int))
        for sample in dataset:
            tokens = self._tokenizer.tokenize(sample['sentence'])

            # map word not in vocab to <unk>
            # TODO: Your code
            for i in range(len(tokens)):
                if tokens[i] not in self._vocab:
                    tokens[i] = self._unk
            #     order
            text_ngrams = nltk.ngrams(tokens, n=order, pad_left=True, pad_right=True,
                                      left_pad_symbol=self._bos,␣
→right_pad_symbol=self._eos)
            for ngram in text_ngrams:
                context = tuple(ngram[:-1])
                word = ngram[-1]
                counter[context][word] += 1
        return counter

    def compute_prob(self, context, word, order):
        """
        context: tuple of string
        word: string
        """
        p = 0.0
        # TODO: Your code
        if order<1:
            return 0.0
        if order==1:
            return self._prob[1][()][word]
        #     history           lower order
        if sum(self._counters[order][context].values()) == 0:
            # backoff   shorter context
            shorter = context[1:] if len(context) > 1 else ()
            return self.compute_prob(shorter, word, order-1)
        discount_prob = self._prob[order][context][word]
        lower_context = context[1:] if len(context) > 1 else ()
        lower_order_prob = self.compute_prob(lower_context, word, order-1)
        bow = self._bow[order][context]
        p=discount_prob + bow * lower_order_prob
        return p


    def estimate_backoff_weight(self, order):
        """
        Compute the backoff weight for an input order.
```

```python
    order: 2...N
    self._bow[order] should be updated after calling the function.
    """
    # TODO: Your code
    """
        context    = order-1    lambda(h) = D * N_h / c(h)
    """

    for context, succ in self._counters[order].items():
      c_h = sum(succ.values()) # context
      if c_h == 0:
        self._bow[order][context] = 1.0
        continue
      N_h = len(succ)  #    context,
      self._bow[order][context] = (self._D * N_h) / c_h


  def compute_lo_count(self, counter): #lower_counter
    """
    Given a counter object that stores the N-gram counts,
    return the N-1 gram counter calculated from Kneser-Ney smoothing.
    """
    """
      n-gram counter
    n-1    "continuation counts"
    lo_counter[lo_context][w] = |{ distinct high-order contexts c : (c, w) > 0
                                   and suffix(c) == lo_context }|
    """
    #
    lo_counter_set = defaultdict(lambda: defaultdict(set))

    for context in counter:
        for w in counter[context]:
            lo_context = context[1:] if context else context
            lo_counter_set[lo_context][w].add(context)

    #   set
    lo_counter = defaultdict(lambda: defaultdict(int))
    for lo_context in lo_counter_set:
        for w in lo_counter_set[lo_context]:
            lo_counter[lo_context][w] = len(lo_counter_set[lo_context][w])

    return lo_counter


  def estimate_prob(self, counter, D, order):
    """
```

```python
    Compute the discounted probabilities using absolute discounting,
    using the input counter, with discount factor D, and the order.
    """
    # prob[context][word] returns a score
    prob = defaultdict(lambda: defaultdict(float))

    # TODO: Your code
    for context in counter.keys():
      total_count=sum(counter[context].values()) #  context  word
      if total_count==0:
          continue
      for word in counter[context].keys():
        prob[context][word]=max(counter[context][word] - D,0.0) / total_count

    return prob
 def train(self, dataset):
  print("estimating vocabulary set with mincount = {}".format(self.
↪_min_count))
    self._select_vocab(dataset, self._min_count)

    # 1)    raw counts
    for n in range(1, self._order + 1):
        self._counters[n] = self.compute_count(dataset, n)

    # 2)        backoff weights   raw counts
    for n in range(self._order, 1, -1):
        raw_counter = self._counters[n]

        #          raw_counter
        self._prob[n] = self.estimate_prob(raw_counter, self._D, n)

        self.estimate_backoff_weight(n)


        #    n-1   continuation counts  raw_counter
        self._cont_counters[n-1] = self.compute_lo_count(raw_counter)

    # 3) unigram    bigram    continuation counts cont_counters[1]
    if self._order >= 2:
        cont_map = self._cont_counters[1][()]
        total_cont = sum(cont_map.values())
        if total_cont == 0:
            #     raw unigram MLE
            total = sum(sum(self._counters[1][c].values()) for c in self.
↪_counters[1])
            for w, cnt in self._counters[1][()].items():
                self._prob[1][()][w] = cnt/total if total>0 else 0.0
```

```python
        else:
            for w, cnt in cont_map.items():
                self._prob[1][()][w] = cnt / total_cont
    else:
        #    unigram
        total = 0
        for ctx in self._counters[1]:
            total += sum(self._counters[1][ctx].values())
        for w, cnt in self._counters[1][()].items():
            self._prob[1][()][w] = cnt / total if total>0 else 0.0


def perplexity(self, dataset):
    """
    Given a test file that contains a list of sentences line-by-line, read all␣
↪lines and
    compute word perplexity of the test file.
    Please do not change the code here as it is for evaluation for all students.
    """
    log_prob = 0.0
    N = 0.0
    for sample in dataset:
        tokens = self._tokenizer.tokenize(sample['sentence'])

        # map word not in vocab to <unk>
        tokens = [w if w in self._vocab else self._unk for w in tokens]

        # N-grams of sentence
        text_ngrams = nltk.ngrams(tokens, n=self._order, pad_left=True,␣
↪pad_right=True, left_pad_symbol=self._bos, right_pad_symbol=self._eos)

        # x is a tuple of N-gram tokens
        for x in text_ngrams:
            context, word = x[:-1], x[-1]
            p = self.compute_prob(context, word, self._order)
            if p < 1e-10:
                print("ERROR: small prob for {} {} {}".format(" ".join(context),␣
↪word, p))
            else:
                log_prob += math.log(p)
                N += 1
    return math.exp(-log_prob / N)


def generate(self):
    """
    Generate a random sentence using the trained LM.
    Return a sentence.
```

```python
    """
    context = [self._bos] * (self._order-1)
    result = []

    # TODO: Your code
    # Think about how each token is generated from a LM given a context. This
→involves
    # sampling a word from your LM.
    while True:
        #            context
        possible_words = list(self._prob[self._order][tuple(context)].keys())
        if not possible_words:
            next_word = self._eos
        else:
            #
            probs = [self.compute_prob(tuple(context), w, self._order) for w in
→possible_words]
            next_word = random.choices(possible_words, weights=probs, k=1)[0]
→#

        result.append(next_word)
        context.append(next_word)
        context = context[1:]

        if next_word == self._eos or len(result) > 100:
            break


    return " ".join(result)

def check_prob(self, context, order):
    """
    This is for checking whether your LM behaves properly on each word context.
    """
    z = 0.0
    for word in self._vocab:
        if word != self._bos:
            z += self.compute_prob(context, word, order)
    if z < 0.99999 or z > 1.000001:
        print("Prob sum check failed at order {} for context {}!".format(order,
→context),z)
        return False

    return True

def check_lm(self):
```

```
    """
    This is for checking whether your LM behaves properly on each word context.
    """
    # check 1-gram prob, should sum to 1!
    self.check_prob((), 1)

    # check high-order prob
    for o in range(2, self._order+1):
      for i, context in enumerate(self._prob[o].keys()):
        self.check_prob(context, o)
        if i >= 1000: break
```

```
[nltk_data] Downloading package punkt to /root/nltk_data…
[nltk_data]   Unzipping tokenizers/punkt.zip.
```

[ ]:

3.1.5 Main *program*

```
[ ]: # print the timestamp (Please do not remove)
     !date

     from datasets import load_dataset

     def load_ptb_text_only():
         dataset = load_dataset("text", data_files={
             "train": "https://raw.githubusercontent.com/wojzaremba/lstm/master/data/
     ↪ptb.train.txt",
             "validation": "https://raw.githubusercontent.com/wojzaremba/lstm/master/
     ↪data/ptb.valid.txt",
             "test": "https://raw.githubusercontent.com/wojzaremba/lstm/master/data/
     ↪ptb.test.txt",
         })
         dataset = dataset.rename_column("text", "sentence")
         return dataset

     if __name__ == '__main__':
         dataset = load_ptb_text_only()

         lm = KNLM(order=2, D=0.5, min_count=1, tokenizer=SimpleTokenizer())
         lm.train(dataset['train'])

         # check probs for all orders. should sum to 1.0 in any context
         lm.check_lm()

         train_ppl = lm.perplexity(dataset['train'])
         valid_ppl = lm.perplexity(dataset['validation'])
```

```
    test_ppl = lm.perplexity(dataset['test'])

    print("Training perplexity = {}".format(train_ppl)) # Expect: ~78
    print("Validation perplexity = {}".format(valid_ppl)) # Expect: ~208
    print("Test perplexity = {}".format(test_ppl)) # Expect: ~192
```

Wed Oct   1 09:30:26 AM UTC 2025

Downloading data: 0%| | 0.00/5.10M [00:00<?, ?B/s]

Downloading data: 0%| | 0.00/400k [00:00<?, ?B/s]

Downloading data: 0%| | 0.00/450k [00:00<?, ?B/s]

Generating train split: 0 examples [00:00, ? examples/s]

Generating validation split: 0 examples [00:00, ? examples/s]

Generating test split: 0 examples [00:00, ? examples/s]

```
estimating vocabulary set with mincount = 1
Size of vocabulary is 10001
Training perplexity = 78.74210326162765
Validation perplexity = 208.67234215608735
Test perplexity = 192.5003499504137
```

```
[ ]:  # look at some sentence
      print(dataset['train'])
      print(dataset['train'].features)
      print(dataset['train'].num_rows)
      print(dataset['train'][0])
      print(dataset['train'][100])
      print(dataset['train'][200])
```

```
Dataset({
    features: ['sentence'],
    num_rows: 42068
})
{'sentence': Value('string')}
42068
{'sentence': ' aer banknote berlitz calloway centrust cluett fromstein gitano
guterman hydro-quebec ipo kia memotec mlx nahb punts rake regatta rubens sim
snack-food ssangyong swapo wachter '}
{'sentence': " plans that give advertisers discounts for maintaining or
increasing ad spending have become permanent <unk> at the news <unk> and
underscore the fierce competition between newsweek time warner inc. 's time
magazine and <unk> b. <unk> 's u.s. news & world report "}
{'sentence': ' at cray computer he will be paid $ N '}
```

3.2 c. Tuning the discount factor `D` (D=0.1,0.2 ... 0.9) and the N-gram order (N=2, 3, 4) on the validation set. Report the word perplexity on the validation and test sets.

```
[ ]: # print the timestamp (Please do not remove)
     !date

     print(dataset.keys())
     valid_set = dataset['validation']
     test_set = dataset['test']

     # TODO: Your code
     discounts = [0.1 * i for i in range(1, 10)]  # 0.1 ... 0.9
     orders = [2, 3, 4]
     for order in orders:
         for D in discounts:
             print(f"\n=== Training LM: order={order}, D={D:.1f} ===")
             lm = KNLM(order=order, D=D, min_count=1, tokenizer=SimpleTokenizer())
             lm.train(valid_set)
             # sanity check: all probs normalized
             #lm.check_lm()
             valid_ppl = lm.perplexity(valid_set)
             test_ppl = lm.perplexity(test_set)

             print(f"Validation perplexity = {valid_ppl:.3f}")
             print(f"Test perplexity       = {test_ppl:.3f}")
```

```
Wed Oct  1 09:31:44 AM UTC 2025
dict_keys(['train', 'validation', 'test'])

=== Training LM: order=2, D=0.1 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 29.815
Test perplexity       = 406.621

=== Training LM: order=2, D=0.2 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 31.400
Test perplexity       = 316.936

=== Training LM: order=2, D=0.3 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 33.269
Test perplexity       = 275.831
```

```
=== Training LM: order=2, D=0.4 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 35.520
Test perplexity      = 251.460


=== Training LM: order=2, D=0.5 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 38.311
Test perplexity      = 235.469


=== Training LM: order=2, D=0.6 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 41.915
Test perplexity      = 224.651


=== Training LM: order=2, D=0.7 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 46.861
Test perplexity      = 217.646


=== Training LM: order=2, D=0.8 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 54.380
Test perplexity      = 214.144


=== Training LM: order=2, D=0.9 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 68.555
Test perplexity      = 215.298


=== Training LM: order=3, D=0.1 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 3.510
Test perplexity      = 627.063


=== Training LM: order=3, D=0.2 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 3.760
Test perplexity      = 390.373
```

```
=== Training LM: order=3, D=0.3 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 4.071
Test perplexity      = 298.214


=== Training LM: order=3, D=0.4 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 4.465
Test perplexity      = 248.146


=== Training LM: order=3, D=0.5 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 4.985
Test perplexity      = 216.791


=== Training LM: order=3, D=0.6 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 5.704
Test perplexity      = 195.779


=== Training LM: order=3, D=0.7 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 6.776
Test perplexity      = 181.497


=== Training LM: order=3, D=0.8 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 8.597
Test perplexity      = 172.500


=== Training LM: order=3, D=0.9 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 12.672
Test perplexity      = 169.348


=== Training LM: order=4, D=0.1 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
ERROR: small prob for $ N a bushel 6.990322641088791e-11
ERROR: small prob for $ N a metric 6.990322641088791e-11
ERROR: small prob for $ N a square 6.990322641088791e-11
```

```
ERROR: small prob for $ N a square 6.990322641088791e-11
ERROR: small prob for $ N a square 6.990322641088791e-11
ERROR: small prob for $ N a square 6.990322641088791e-11
Validation perplexity = 1.733
Test perplexity       = 698.468


=== Training LM: order=4, D=0.2 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 1.809
Test perplexity       = 400.052


=== Training LM: order=4, D=0.3 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 1.913
Test perplexity       = 290.921


=== Training LM: order=4, D=0.4 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 2.056
Test perplexity       = 233.812


=== Training LM: order=4, D=0.5 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 2.257
Test perplexity       = 198.891


=== Training LM: order=4, D=0.6 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 2.551
Test perplexity       = 175.808


=== Training LM: order=4, D=0.7 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 3.012
Test perplexity       = 160.149


=== Training LM: order=4, D=0.8 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 3.839
Test perplexity       = 150.054
```

```
=== Training LM: order=4, D=0.9 ===
estimating vocabulary set with mincount = 1
Size of vocabulary is 6023
Validation perplexity = 5.824
Test perplexity       = 145.750
```

##**d**. Use your model to generate 10 sentences. Can you comment on the quality of the generated sentences?

```
[ ]:  # print the timestamp (Please do not remove)
      !date

      # TODO: Your code
      for _ in range(10):
        print(lm.generate())
```

```
Wed Oct  1 09:33:45 AM UTC 2025
together the two stocks <unk> havoc among takeover stock traders had been
betting against mr. trump because he has a record of disclosing stakes in
companies that are potential takeover targets then selling at a multiple about
even with the market says mr. douglas </s>
today of all days she <unk> </s>
national geographic the <unk> u.s. magazine is attracting more readers than does
a magazine like <unk> the page costs you an arm and a leg to develop any
frequency says harry glass new york media manager for bozell inc </s>
a spokesman said N million shares and american telephone & telegraph co. for N
years before choosing his current trade </s>
<unk> is a <unk> he says </s>
in addition to making <unk> systems the unit also makes laser warning <unk> </s>
the <unk> on oct. N </s>
but the rally was largely confined to the blue-chip stocks which had been
expected to <unk> a <unk> that makes one <unk> for the <unk> of <unk> and <unk>
and a thousand tactical aircraft to the air force contract for <unk> equipment
</s>
if they do good credit analysis they will avoid the hand <unk> </s>
when it was all over and stocks had staged a huge recovery big board officials
were <unk> about how well the day had gone </s>
```

Your answer:

The sentences show some local fluency and news-like, but many tokens and incomplete parts make them hard to read. A simple improvement would be to use a larger vocabulary to reduce .

4 2. Multinomial Logistic Regression [50 pts]

In this question, we will focus on intent classification using the banking corpora which are available via the Huggingface dataset library. This dataset is composed of 10003 training samples and 3080 test samples. There are 77 intents in the data. You can view the data from the provided codes below.

In Part I of the exercise, we provided code that loads the dataset using `datasets.load_dataset` and divides the original training data into our training set and validation set in the ratio of 9:1, so that you can use the validation set for hyper-parameter model tuning. As always, you should not tune on the test set for fair reporting of test results.

4.1 Setup environment

```
[ ]:  !pip install datasets nltk scikit-learn
```

Requirement already satisfied: datasets in /usr/local/lib/python3.12/dist-
packages (4.0.0)
Requirement already satisfied: nltk in /usr/local/lib/python3.12/dist-packages
(3.9.1)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.12/dist-
packages (1.6.1)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-
packages (from datasets) (3.19.1)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.12/dist-
packages (from datasets) (2.0.2)
Requirement already satisfied: pyarrow>=15.0.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (18.1.0)
Requirement already satisfied: dill<0.3.9,>=0.3.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.3.8)
Requirement already satisfied: pandas in /usr/local/lib/python3.12/dist-packages
(from datasets) (2.2.2)
Requirement already satisfied: requests>=2.32.2 in
/usr/local/lib/python3.12/dist-packages (from datasets) (2.32.4)
Requirement already satisfied: tqdm>=4.66.3 in /usr/local/lib/python3.12/dist-
packages (from datasets) (4.67.1)
Requirement already satisfied: xxhash in /usr/local/lib/python3.12/dist-packages
(from datasets) (3.5.0)
Requirement already satisfied: multiprocess<0.70.17 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.70.16)
Requirement already satisfied: fsspec<=2025.3.0,>=2023.1.0 in
/usr/local/lib/python3.12/dist-packages (from
fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (2025.3.0)
Requirement already satisfied: huggingface-hub>=0.24.0 in
/usr/local/lib/python3.12/dist-packages (from datasets) (0.35.0)
Requirement already satisfied: packaging in /usr/local/lib/python3.12/dist-
packages (from datasets) (25.0)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.12/dist-
packages (from datasets) (6.0.2)
Requirement already satisfied: click in /usr/local/lib/python3.12/dist-packages
(from nltk) (8.2.1)
Requirement already satisfied: joblib in /usr/local/lib/python3.12/dist-packages
(from nltk) (1.5.2)
Requirement already satisfied: regex>=2021.8.3 in
/usr/local/lib/python3.12/dist-packages (from nltk) (2024.11.6)

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```
Requirement already satisfied: scipy>=1.6.0 in /usr/local/lib/python3.12/dist-
packages (from scikit-learn) (1.16.2)
Requirement already satisfied: threadpoolctl>=3.1.0 in
/usr/local/lib/python3.12/dist-packages (from scikit-learn) (3.6.0)
Requirement already satisfied: aiohttp!=4.0.0a0,!=4.0.0a1 in
/usr/local/lib/python3.12/dist-packages (from
fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (3.12.15)
Requirement already satisfied: typing-extensions>=3.7.4.3 in
/usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.24.0->datasets)
(4.15.0)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in
/usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.24.0->datasets)
(1.1.10)
Requirement already satisfied: charset_normalizer<4,>=2 in
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(3.4.3)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-
packages (from requests>=2.32.2->datasets) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.12/dist-packages (from requests>=2.32.2->datasets)
(2025.8.3)
Requirement already satisfied: python-dateutil>=2.8.2 in
/usr/local/lib/python3.12/dist-packages (from pandas->datasets) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.12/dist-
packages (from pandas->datasets) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.12/dist-
packages (from pandas->datasets) (2025.2)
Requirement already satisfied: aiohappyeyeballs>=2.5.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (2.6.1)
Requirement already satisfied: aiosignal>=1.4.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (1.4.0)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.12/dist-
packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets)
(25.3.0)
Requirement already satisfied: frozenlist>=1.1.1 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (1.7.0)
Requirement already satisfied: multidict<7.0,>=4.5 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (6.6.4)
Requirement already satisfied: propcache>=0.2.0 in
/usr/local/lib/python3.12/dist-packages (from
```

```
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets) (0.3.2)
Requirement already satisfied: yarl<2.0,>=1.17.0 in
/usr/local/lib/python3.12/dist-packages (from
aiohttp!=4.0.0a0,!=4.0.0a1->fsspec[http]<=2025.3.0,>=2023.1.0->datasets)
(1.20.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.12/dist-
packages (from python-dateutil>=2.8.2->pandas->datasets) (1.17.0)
```

```python
import numpy as np
import os
import torch
from collections import Counter
import operator
from torch.utils.data import Dataset
import torch.nn as nn
from torch.autograd import Variable
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
nltk.download('punkt')
nltk.download('stopwords')
device = torch.device("cuda:0" if torch.cuda.is_available() else "cpu")
english_stopwords = stopwords.words('english')
```

```
[nltk_data] Downloading package punkt to /root/nltk_data…
[nltk_data]    Unzipping tokenizers/punkt.zip.
[nltk_data] Downloading package stopwords to /root/nltk_data…
[nltk_data]    Unzipping corpora/stopwords.zip.
```

4.2   Some of the Hyper parameters

```python
learning_rate = 0.1
vocab_size = 64000 # number N-gram features in the vocabulary base
num_epochs = 100 # number epoch to train
batch_size = 16
ngram_n = 1 # the n in n-gram
num_class = 77 # Number of intents in banking77 corpus
```

##Part I: Dataset

```python
#Data Loading from Huggingface
import datasets
from datasets import load_dataset
data = load_dataset("banking77")
```

```
/usr/local/lib/python3.12/dist-packages/huggingface_hub/utils/_auth.py:94:
UserWarning:
The secret `HF_TOKEN` does not exist in your Colab secrets.
To authenticate with the Hugging Face Hub, create a token in your settings tab
```

(https://huggingface.co/settings/tokens), set it as secret in your Google Colab
and restart your session.
You will be able to reuse this secret in all of your notebooks.
Please note that authentication is recommended but still optional to access
public models or datasets.
  warnings.warn(

README.md: 0.00B [00:00, ?B/s]

data/train-00000-of-00001.parquet: 0%| | 0.00/298k [00:00<?, ?B/s]

data/test-00000-of-00001.parquet: 0%| | 0.00/93.9k [00:00<?, ?B/s]

Generating train split: 0%| | 0/10003 [00:00<?, ? examples/s]

Generating test split: 0%| | 0/3080 [00:00<?, ? examples/s]

```
[ ]: data.keys()
```

```
[ ]: dict_keys(['train', 'test'])
```

```
[ ]: print(data['train'])
     print(data['test'])
     label_dist = [0] * num_class
     for k in data['train']['label']:
       label_dist[k] += 1
     print(label_dist)
```

```
Dataset({
    features: ['text', 'label'],
    num_rows: 10003
})
Dataset({
    features: ['text', 'label'],
    num_rows: 3080
})
[159, 110, 126, 87, 127, 171, 181, 156, 157, 129, 59, 153, 112, 139, 112, 187,
168, 167, 61, 177, 160, 122, 86, 35, 129, 153, 173, 133, 182, 121, 121, 121,
112, 118, 166, 137, 126, 97, 106, 129, 98, 82, 121, 120, 105, 159, 143, 149,
148, 115, 95, 162, 169, 161, 129, 108, 111, 114, 114, 145, 97, 146, 103, 175,
172, 113, 171, 128, 102, 104, 113, 126, 41, 135, 121, 180, 163]
```

```
[ ]: print(data['train'][:3])
```

```
{'text': ['I am still waiting on my card?', "What can I do if my card still
hasn't arrived after 2 weeks?", 'I have been waiting over a week. Is the card
still coming?'], 'label': [11, 11, 11]}
```

```
[ ]: TRAIN_SIZE = int(len(data["train"]) * 0.9)
     VALIDATION_SIZE = len(data["train"]) - TRAIN_SIZE
     TEST_SIZE = len(data["test"])
```

```python
PADDING_IDX = 0
print(TRAIN_SIZE)
print(VALIDATION_SIZE)
print(TEST_SIZE)
print(english_stopwords)
```

```
9002
1001
3080
['a', 'about', 'above', 'after', 'again', 'against', 'ain', 'all', 'am', 'an',
'and', 'any', 'are', 'aren', "aren't", 'as', 'at', 'be', 'because', 'been',
'before', 'being', 'below', 'between', 'both', 'but', 'by', 'can', 'couldn',
"couldn't", 'd', 'did', 'didn', "didn't", 'do', 'does', 'doesn', "doesn't",
'doing', 'don', "don't", 'down', 'during', 'each', 'few', 'for', 'from',
'further', 'had', 'hadn', "hadn't", 'has', 'hasn', "hasn't", 'have', 'haven',
"haven't", 'having', 'he', "he'd", "he'll", 'her', 'here', 'hers', 'herself',
"he's", 'him', 'himself', 'his', 'how', 'i', "i'd", 'if', "i'll", "i'm", 'in',
'into', 'is', 'isn', "isn't", 'it', "it'd", "it'll", "it's", 'its', 'itself',
"i've", 'just', 'll', 'm', 'ma', 'me', 'mightn', "mightn't", 'more', 'most',
'mustn', "mustn't", 'my', 'myself', 'needn', "needn't", 'no', 'nor', 'not',
'now', 'o', 'of', 'off', 'on', 'once', 'only', 'or', 'other', 'our', 'ours',
'ourselves', 'out', 'over', 'own', 're', 's', 'same', 'shan', "shan't", 'she',
"she'd", "she'll", "she's", 'should', 'shouldn', "shouldn't", "should've", 'so',
'some', 'such', 't', 'than', 'that', "that'll", 'the', 'their', 'theirs',
'them', 'themselves', 'then', 'there', 'these', 'they', "they'd", "they'll",
"they're", "they've", 'this', 'those', 'through', 'to', 'too', 'under', 'until',
'up', 've', 'very', 'was', 'wasn', "wasn't", 'we', "we'd", "we'll", "we're",
'were', 'weren', "weren't", "we've", 'what', 'when', 'where', 'which', 'while',
'who', 'whom', 'why', 'will', 'with', 'won', "won't", 'wouldn', "wouldn't", 'y',
'you', "you'd", "you'll", 'your', "you're", 'yours', 'yourself', 'yourselves',
"you've"]
```

```python
class Datum():
    """
    Class that represents a train/validation/test datum
    - self.raw_text
    - self.label
    - self.tokens: list of tokens
    - self.token_idx: index of each token in the text
    """
    def __init__(self, raw_text, label):
        self.raw_text = raw_text
        self.label = label

    def set_ngram(self, ngram_ctr):
        self.ngram = ngram_ctr
```

```python
    def set_token_idx(self, token_idx):
        self.token_idx = token_idx

    def set_tokens(self, tokens):
        self.tokens = tokens

def preprocess_text(text):
    """
    Function that cleans the string
    """
    text = text.lower().replace("<br />", " ")
    return text

def create_dataset(data):
  output = []
  for i in range(len(data['label'])):
    output.append(Datum(preprocess_text(data['text'][i]),data['label'][i]))
  return output
```

```python
shuffle = np.random.RandomState(seed=42).permutation(TRAIN_SIZE +␣
 ↪VALIDATION_SIZE)
TRAIN_ID = shuffle[:TRAIN_SIZE]
VAL_ID = shuffle[TRAIN_SIZE:]
```

```python
trainset = create_dataset(data['train'][TRAIN_ID])
valset = create_dataset(data['train'][VAL_ID])
testset = create_dataset(data['test'][:TEST_SIZE])
```

```python
lst=[]
for i, sample in enumerate(trainset):
    x,y = sample.raw_text, sample.label
    lst.append(y)
print("labels unique:", set(lst))
```

```
labels unique: {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,
18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37,
38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57,
58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76}
```

```python
from collections import defaultdict

# dump label counts for train set
train_label_cnt = defaultdict(int)
for i, sample in enumerate(trainset):
  x,y = sample.raw_text, sample.label
  if i < 2:
    print(x, y)
  train_label_cnt[y] += 1
```

```
print(train_label_cnt, len(trainset))
```

is it possible for me to change my pin number? 21
i'm not sure why my card didn't work 25
defaultdict(<class 'int'>, {21: 101, 25: 133, 59: 134, 15: 171, 5: 157, 27: 116,
34: 150, 53: 144, 7: 139, 17: 153, 57: 105, 60: 94, 24: 119, 6: 158, 69: 94, 12:
98, 4: 116, 39: 116, 74: 111, 54: 114, 76: 152, 47: 132, 19: 152, 48: 135, 32:
105, 29: 111, 13: 124, 45: 140, 20: 145, 52: 150, 11: 140, 38: 98, 73: 116, 28:
162, 30: 109, 70: 100, 75: 165, 63: 160, 40: 91, 64: 153, 18: 51, 66: 147, 35:
123, 56: 97, 61: 139, 46: 124, 3: 82, 23: 31, 16: 150, 51: 145, 37: 89, 31: 113,
72: 37, 58: 96, 33: 115, 9: 122, 67: 117, 2: 113, 8: 141, 50: 81, 65: 100, 71:
115, 43: 105, 1: 96, 41: 76, 26: 158, 55: 97, 14: 100, 0: 143, 22: 75, 68: 96,
49: 104, 36: 116, 62: 93, 42: 108, 44: 92, 10: 52}) 9002

```
# dump label counts for val set
val_label_cnt = defaultdict(int)
for i, sample in enumerate(valset):
  x,y = sample.raw_text, sample.label
  if i < 2:
    print(x, y)
  val_label_cnt[y] += 1
print(val_label_cnt, len(valset))
```

there is a payment with my card which i definitely did not make by me .never
seen that it before. 16
can i see where my money came from? 70
defaultdict(<class 'int'>, {16: 18, 70: 13, 59: 11, 24: 10, 43: 15, 58: 18, 1:
14, 17: 14, 5: 14, 73: 19, 63: 15, 37: 8, 7: 17, 66: 24, 26: 15, 28: 20, 38: 8,
56: 14, 19: 25, 54: 15, 40: 7, 6: 23, 69: 10, 23: 4, 74: 10, 64: 19, 2: 13, 45:
19, 48: 13, 20: 15, 0: 16, 11: 13, 25: 20, 29: 10, 46: 19, 71: 11, 36: 10, 75:
15, 32: 7, 55: 11, 51: 17, 8: 16, 21: 21, 15: 16, 30: 12, 61: 7, 39: 13, 3: 5,
60: 3, 52: 19, 4: 11, 65: 13, 27: 17, 47: 17, 14: 12, 12: 14, 34: 16, 35: 14,
44: 13, 31: 8, 42: 13, 13: 15, 57: 9, 18: 10, 62: 10, 72: 4, 53: 17, 49: 11, 9:
7, 76: 11, 67: 11, 68: 6, 50: 14, 22: 11, 33: 3, 41: 6, 10: 7}) 1001

4.3   Part II: Feature Engineering - Bag of N-gram

The first step to deal with text data is to transform them into logic structure that computers can
"understand". For this problem, we will use the trick of Bag of N-grams. A (word-level) N-gram can
be thought of as a continuous sequence of tokens in a document. For instance, given a document
"I love NLP", if we tokenize it using space, we will have unigrams {I; love; NLP}, a bigrams {(I;
love); (love; NLP)}, and trigram {(I love nlp)}.

To represent N-gram, we will first set a vocabulary base V which can be viewed as a set of words.
Since we are limited by the available computational resources, we need to set a limit on the number
of vocabularies we add to our vocabulary base. A common way to construct vocabulary base is to
choose the top k (a hyper-parameter set by user) most frequently occurred N-grams in the data
set.

We provide you with a top-level function process text dataset that transforms a collection of text

data points into a collection of n-gram indices. The n-gram indices are served as a sparse vector of an input document. Your job is to fill in the code for the helper functions that complete this process. You will find the Python Counter object very helpful in this part of the assignment.

Please refer to https://docs.python.org/2/library/collections.html#collections.Counter for more info.

2.1 Extract N-gram from Text

Function `def extract_ngram_from_text` takes two inputs: a raw text string text and an integer n which represents the max length of continuous tokens we would like to extract from text. For input 'I love NLP' and n = 2, this function should extract all unigram and bigrams tokens = {I; love; NLP; (I; love); (love; NLP)}. Note that in addition to tokens, this program should also output an Python Counter object that counts the number of occurrences for each N-gram in tokens. Please fill in your code to complete this function.

2.2 Construct Vocabulary Base

Once we obtain the N-grams for each sample, we can construct our vocabulary base. Function `def construct_ngram_indexer` takes in two arguments ngram counter list, which is a collection of Python Counter mentioned in the previous problem, and an integer topk. This function should form a vocabulary base using the most common topk N-grams. Moreover, we would like to take a further step and create a dictionary ngram indexer that maps each N-gram in our vocabulary base to a unique integer that represents the N-gram's identity. Note that index 0 is reserved for special padding symbol which will be explained later. Please fill in your code to complete this function.

2.3 Map N-gram to Index

Lastly, function token to index takes in tokens, which is a list of N-grams, and ngram indexer constructed above and maps each N-gram in the list to its corresponding index. Please fill in your code to complete this function.

```python
def extract_ngram_from_text(text, n, remove_stopwords=True):
    """
    Function that retrieves all n-grams from the input string
    @param text: raw string
    @param n: integer that tells the model to retrieve all k-gram where k<=n
    @return ngram_counter: a counter that maps n-gram to its frequency
    @return tokens: a list of parsed ngrams
    """
    # tokenize words - for simplicity just split by space
    #tokens = text.split(" ")
    tokens = nltk.word_tokenize(text)
    if remove_stopwords:
        tokens = [token for token in tokens if token not in english_stopwords]
    # extract n grams
    # TODO: replace with your code
    ngram_counter = Counter()
    all_ngrams=[]
    for k in range(1, n + 1):
        for start in range(0, len(tokens) - k + 1):
```

```python
            ngram = tokens[start:start + k]
            ngram_tuple = tuple(ngram)
            ngram_counter[ngram_tuple] += 1
            all_ngrams.append(ngram_tuple)

    return ngram_counter, all_ngrams


def construct_ngram_indexer(ngram_counter_list, topk):
    """
    Function that selects the most common topk ngrams
    @param ngram_counter_list: list of counters
    @param topk, int: # of
    @return ngram2idx: a dictionary that maps ngram to an unique index
    """
    # TODO: fill in your code here
    # find the top k ngram
    # maps the ngram to an unique index
    print(topk)
    total_counter=Counter()
    for ngram_counter in ngram_counter_list:
        total_counter.update(ngram_counter)
    topk_grams=total_counter.most_common(topk) #[('a', 5), ('r', 2), ('b', 2)]
    print(len(topk_grams))
    ngram_indexer={}
    cnt=1
    for i in topk_grams:
        cnt+=1
        ngram_indexer[i[0]]=cnt
    print(ngram_indexer)
    print(len(ngram_indexer))
    return ngram_indexer


def token_to_index(tokens, ngram_indexer):
    """
    Function that transform a list of tokens to a list of token index.
    @param tokens: list of ngram
    @param ngram_indexer: a dictionary that maps ngram to an unique index
    """
    # TODO: replace with your code
    # Please DO NOT assign any ngram to index 0 which is reserved for PAD token
    index_list=[]
    UNK_INDEX = 1
    for i in tokens:
        if i in ngram_indexer.keys():
            index_list.append(ngram_indexer[i])
        else:
```

```
            index_list.append(UNK_INDEX)
    return index_list

def process_text_dataset(dataset, n, topk=None, ngram_indexer=None):
    """
    Top level function that encodes each datum into a list of ngram indices
    @param dataset: list of Datum
    @param n: n in "n-gram"
    @param topk: #
    @param ngram_indexer: a dictionary that maps ngram to an unique index
    """
    # extract n-gram
    for i in range(len(dataset)):
        text_datum = dataset[i].raw_text
        ngrams, tokens = extract_ngram_from_text(text_datum, n)
        dataset[i].set_ngram(ngrams)
        dataset[i].set_tokens(tokens)
    # select top k ngram
    if ngram_indexer is None:
        ngram_indexer = construct_ngram_indexer([datum.ngram for datum in␣
 ↪dataset], topk)
    # vectorize each datum
    for i in range(len(dataset)):
        dataset[i].set_token_idx(token_to_index(dataset[i].tokens,␣
 ↪ngram_indexer))
    return dataset, ngram_indexer
```

```
[ ]: import nltk
     nltk.download('punkt_tab')
```

```
[nltk_data] Downloading package punkt_tab to /root/nltk_data…
[nltk_data]   Package punkt_tab is already up-to-date!
```

```
[ ]: True
```

```
[ ]: # convert text data into list of index – should take few mins
     # Note that we are using the train_ngram_indexer to index validation and test␣
      ↪dataset. Why?
     # Your answer:
     # We use the train n-gram indexer for validation and test because it makes sure␣
      ↪all datasets use the same word-to-index mapping.
     # Otherwise, training, validation, and testing will be misaligned and weights␣
      ↪will be assigned wrongly.
     train_data, train_ngram_indexer = process_text_dataset(trainset, ngram_n,␣
      ↪vocab_size)
     validation_data, _ = process_text_dataset(valset, ngram_n,␣
      ↪ngram_indexer=train_ngram_indexer)
```

```
test_data, _ = process_text_dataset(testset, ngram_n,␣
  ↪ngram_indexer=train_ngram_indexer)
```

```
64000
2200
{('?',): 2, ('.',): 3, ('card',): 4, ("n't",): 5, (',',): 6, ('account',): 7,
('money',): 8, ('transfer',): 9, ('get',): 10, ('payment',): 11, ('need',): 12,
('cash',): 13, ('top',): 14, ('exchange',): 15, ('charged',): 16, ('please',):
17, ("'s",): 18, ('atm',): 19, ('app',): 20, ('fee',): 21, ('use',): 22,
('pending',): 23, ('top-up',): 24, ('!',): 25, ('help',): 26, ('would',): 27,
('made',): 28, ('long',): 29, ('transaction',): 30, ('still',): 31, ('new',):
32, ('pin',): 33, ('rate',): 34, ('take',): 35, ('make',): 36, ('wrong',): 37,
('know',): 38, ('charge',): 39, ('cards',): 40, ('withdrawal',): 41,
('declined',): 42, ('refund',): 43, ('want',): 44, ("'m",): 45, ('see',): 46,
('got',): 47, ('tell',): 48, ('go',): 49, ('yet',): 50, ('extra',): 51,
('like',): 52, ('tried',): 53, ('one',): 54, ('using',): 55, ('virtual',): 56,
('work',): 57, ('something',): 58, ('identity',): 59, ('disposable',): 60,
('showing',): 61, ('ca',): 62, ('currencies',): 63, ('amount',): 64,
('statement',): 65, ('received',): 66, ('currency',): 67, ('change',): 68,
('going',): 69, ('working',): 70, ('funds',): 71, ('check',): 72, ('bank',): 73,
('pay',): 74, ("'ve",): 75, ('ago',): 76, ('back',): 77, ('someone',): 78,
('think',): 79, ('possible',): 80, ('verify',): 81, ('getting',): 82, ('find',):
83, ('time',): 84, ('could',): 85, ('much',): 86, ('debit',): 87, ('cancel',):
88, ('transfers',): 89, ('purchase',): 90, ('sent',): 91, ('receive',): 92,
('withdraw',): 93, ('used',): 94, ('able',): 95, ('fees',): 96, ('times',): 97,
('days',): 98, ('balance',): 99, ('add',): 100, ('order',): 101,
('verification',): 102, ('bought',): 103, ('show',): 104, ('mastercard',): 105,
('reason',): 106, ('phone',): 107, ('direct',): 108, ('cheque',): 109,
('right',): 110, ('another',): 111, ('lost',): 112, ('details',): 113, ('way',):
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156, ('earlier',): 157, ('noticed',): 158, ('thought',): 159, ('keep',): 160,
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('online',): 165, ('seems',): 166, ('apple',): 167, ('beneficiary',): 168,
('happened',): 169, ('says',): 170, ('gbp',): 171, ('incorrect',): 172,
('two',): 173, ('uk',): 174, ('hello',): 175, ('seller',): 176, ('failed',):
177, ('auto',): 178, ('available',): 179, ('checked',): 180, ('requested',):
181, ('send',): 182, ('passcode',): 183, ('rates',): 184, ('complete',): 185,
('additional',): 186, ('country',): 187, ('since',): 188, ('friend',): 189,
('week',): 190, ('last',): 191, ('information',): 192, ('never',): 193,
```

('code',): 194, ('countries',): 195, ('access',): 196, ('free',): 197,
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('google',): 202, ('error',): 203, ('arrived',): 204, ('wait',): 205, ('done',):
206, ('multiple',): 207, ('issue',): 208, ('found',): 209, ('applied',): 210,
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('international',): 215, ('wanted',): 216, ('purchased',): 217, ('machine',):
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('changed',): 231, ('allowed',): 232, ('service',): 233, ('recently',): 234,
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('pound',): 248, ('double',): 249, ('express',): 250, ('without',): 251,
('fix',): 252, ('even',): 253, ('rejected',): 254, ('accepted',): 255,
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("'d",): 260, ('age',): 261, ('american',): 262, ('exchanges',): 263, ('open',):
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('appears',): 310, ('longer',): 311, ('understand',): 312, ('dispute',): 313,
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('less',): 326, ('paying',): 327, ('disappeared',): 328, ('must',): 329,
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('usd',): 334, ('europe',): 335, ('assist',): 336, ('european',): 337,
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2200

4.4 Part III: Construct Input Pipeline for PyTorch

```python
class TextClassifierDataset(Dataset):
    """
    Class that represents a train/validation/test dataset that's readable for␣
 ↪PyTorch
    Note that this class inherits torch.utils.data.Dataset
    """
```

```python
    def __init__(self, data_list):
        """
        @param data_list: list of Datum
        """
        self.data_list = data_list


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


    def __getitem__(self, key):
        """
        Triggered when you call dataset[i]
        """
        token_idx, label = self.data_list[key].token_idx, self.data_list[key].
 ↪label
        return (token_idx, len(token_idx)), label


def text_classifier_collate_func(batch):
    """
    Customized function for DataLoader that dynamically pads the batch so that␣
 ↪all
    data have the same length
    """
    data_list = []
    label_list = []
    length_list = []
    for datum in batch:
        label_list.append(datum[1])
        length_list.append(datum[0][1])
    max_length = np.max(length_list)
    # padding
    for datum in batch:
        padded_vec = np.pad(np.array(datum[0][0]),
                            pad_width=((0,max_length-datum[0][1])),
                            mode="constant", constant_values=0)
        data_list.append(padded_vec)

    # return tuples and send them to device (e.g. cpu/gpu depending on␣
 ↪availability)
    return torch.from_numpy(np.array(data_list)).to(device), torch.
 ↪LongTensor(length_list).to(device), torch.LongTensor(label_list).to(device)

# consturct datasets
py_train = TextClassifierDataset(train_data)
py_validation = TextClassifierDataset(validation_data)
py_test = TextClassifierDataset(test_data)
```

```python
# construct data loader
train_loader = torch.utils.data.DataLoader(dataset=py_train,
                                           batch_size=batch_size,
  
 ↪collate_fn=text_classifier_collate_func,
                                           shuffle=True)
validation_loader = torch.utils.data.DataLoader(dataset=py_validation,
                                                batch_size=batch_size,
  
 ↪collate_fn=text_classifier_collate_func,
                                                shuffle=False)
test_loader = torch.utils.data.DataLoader(dataset=py_test,
                                          batch_size=batch_size,
  
 ↪collate_fn=text_classifier_collate_func,
                                          shuffle=False)
```

```python
print("This is an training sample: {0}".format(py_train[0][0]))
print("This is a label: {0}".format(py_train[0][1]))
```

```
This is an training sample: ([80, 68, 33, 147, 2], 5)
This is a label: 21
```

4.5   Part IV: Define Model

```python
from torch.nn import functional as F

class LogisticRegression(torch.nn.Module):
  def __init__(self, vocab_size, num_class):
    super().__init__()
    # TODO: Your code
    # Hint: Use nn.Embedding to store the feature weights, and set 
 ↪embedding_dim = num_class
    # Note that the # of inputs dimension for embedding shall be vocab_size+1, 
 ↪why?
    # In the embedding, you need to set the padding_idx argument.
    # Please see http://pytorch.org/docs/master/nn.html
    """
      embedding    feature ngram    class
    embedding_dim    num_class    embedding(index)
       j       ngram    class j
    num_embeddings = vocab_size + 1    index 0    padding
    padding_idx=0    padding    embedding    0
    vocab size ,   len(ngram_indexer), UNK index  1  len(ngram_indexer)+1
    """
    self.embedding = nn.Embedding(vocab_size + 2, num_class, padding_idx=0)
```

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```python
 def forward(self, data, length):
     """
         @param data: matrix of size (batch_size, max_length). Each row in data
 ↪represents a
             review that is represented using a list of n-gram indices.
             In a batch, all samples are padded to have the same length.
     """
     # TODO: Your code
     # You need to calculate the sum of the activated feature weights
     # The output of this function should be a Tensor of shape = (batch_size,
 ↪num_class), i.e
     # a batch of logits per class (No need to pass logits into Softmax here, as
 ↪torch.nn.CrossEntropyLoss() takes in logits)
     embedded = self.embedding(data)
     logits = torch.sum(embedded, dim=1)
     return logits

# instantiate a LR model
model = LogisticRegression(vocab_size, num_class)
# send the model to device (cpu/gpu)
model.to(device)
```

```
[ ]: LogisticRegression(
       (embedding): Embedding(64002, 77, padding_idx=0)
     )
```

4.6 Part V: Define Loss Function and Optimizer

```python
[ ]: # Loss and Optimizer
     criterion = torch.nn.CrossEntropyLoss()
     optimizer = torch.optim.SGD(model.parameters(), lr=learning_rate)
     print(learning_rate)
```

```
0.1
```

4.7 Part VI: Train and Test the Model

```python
[ ]: import torch
     from torch.utils.tensorboard import SummaryWriter
     import os

     logs_base_dir = "runs"
     os.makedirs(logs_base_dir, exist_ok=True)

     writer = SummaryWriter()
```

```
%reload_ext tensorboard
%tensorboard --logdir "runs"
```

<IPython.core.display.Javascript object>

```python
import sklearn
import sklearn.metrics

# Define the test model function
def test_model(loader, model):
    """
    Help function that tests the model's performance on a dataset
    @param: loader - data loader for the dataset to test against
    """
    model.eval()
    all_preds = []
    all_labels = []
    for data, lengths, labels in loader:
        with torch.no_grad():
            logits = model(data, lengths)

            all_preds.append(logits.detach().cpu())
            all_labels.append(labels.detach().cpu())

    all_labels = torch.cat(all_labels, dim=0)
    all_logits = torch.cat(all_preds, dim=0)
    all_pred_ids = torch.argmax(all_logits, dim=-1)

    #print("logits shape:", all_logits.shape)
    #print("labels shape:", all_labels.shape)
    #print("labels unique:", all_labels.unique())

    #       numpy
    all_labels_np = all_labels.numpy()
    all_pred_ids_np = all_pred_ids.numpy()

    accuracy = np.sum(all_pred_ids_np == all_labels_np) / len(all_labels_np)
    precision = sklearn.metrics.precision_score(all_labels_np, all_pred_ids_np,
  ↪average="macro")
    recall = sklearn.metrics.recall_score(all_labels_np, all_pred_ids_np,
  ↪average="macro")
    f1 = 2.0 * precision * recall / (precision + recall)

    model.train()
    return accuracy, precision, recall, f1
```

```python
# print the timestamp (Please do not remove)
!date

# Training the Model
model.train()
global_step = 0
for epoch in range(num_epochs):
    for i, (data, lengths, labels) in enumerate(train_loader):
        global_step += 1

        data_batch, length_batch, label_batch = Variable(data),␣
 ↪Variable(lengths), Variable(labels)

        outputs = model(data_batch, length_batch)
        if i == 0:
            print(list(model.parameters()))
        loss = criterion(outputs, label_batch)
        optimizer.zero_grad()
        loss.backward()
        optimizer.step()

        # report performance in tensorboard
        if (i+1) % (batch_size*4) == 0:
            val_acc, val_precision, val_recall, val_f1 =␣
 ↪test_model(validation_loader, model)
            print('Epoch: [{0}/{1}], Step: [{2}/{3}], Loss: {4}, Validation Acc:
 ↪{5}'.format(
                    epoch+1, num_epochs, i+1, len(py_train)//batch_size, loss.
 ↪data, val_acc))
            writer.add_scalar("Loss/train", loss.item(), global_step)
            writer.add_scalar("Acc/dev", val_acc, global_step)
            writer.add_scalar("Precision/dev", val_precision, global_step)
            writer.add_scalar("Recall/dev", val_recall, global_step)
            writer.add_scalar("F1/dev", val_f1, global_step)
```

```
Wed Oct  1 09:52:12 PM UTC 2025
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [ 0.2810, -0.6950, -0.2004,  …,  0.0872, -1.1618, -1.5943],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [64/562], Loss: 5.572443962097168, Validation
Acc:0.01098901098901099

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [128/562], Loss: 6.669904708862305, Validation
Acc:0.012987012987012988
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [192/562], Loss: 6.288942337036133, Validation
Acc:0.014985014985014986

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
```

behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [256/562], Loss: 7.931532859802246, Validation
Acc:0.015984015984015984
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [320/562], Loss: 6.042972564697266, Validation
Acc:0.01898101898101898

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [384/562], Loss: 6.050621032714844, Validation
Acc:0.02097902097902098
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [448/562], Loss: 5.992344379425049, Validation

```
Acc:0.023976023976023976
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [1/100], Step: [512/562], Loss: 5.890442371368408, Validation
Acc:0.026973026973026972
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [ 0.3709, -0.4962, -0.2371,  …,  0.2774, -0.9279, -1.5897],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [64/562], Loss: 5.127223968505859, Validation
Acc:0.03496503496503497
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [128/562], Loss: 5.08686637878418, Validation
Acc:0.03396603396603397
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [2/100], Step: [192/562], Loss: 5.564055442810059, Validation
Acc:0.03796203796203796
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [256/562], Loss: 5.232491493225098, Validation
Acc:0.04395604395604396
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [320/562], Loss: 4.9398088455200195, Validation
Acc:0.04895104895104895
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [384/562], Loss: 5.495912075042725, Validation
Acc:0.052947052947052944
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [448/562], Loss: 5.111919403076172, Validation
Acc:0.059940059940059943
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
```

```
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [2/100], Step: [512/562], Loss: 4.1501383781433105, Validation
Acc:0.061938061938061936
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [ 0.3146, -0.2549, -0.1045,  …,  0.3792, -0.7897, -1.5514],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [3/100], Step: [64/562], Loss: 4.290737628936768, Validation
Acc:0.06893106893106893
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [3/100], Step: [128/562], Loss: 4.692314624786377, Validation
Acc:0.075924075924075924
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [3/100], Step: [192/562], Loss: 5.54392147064209, Validation
Acc:0.08791208791208792
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
```

```
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [3/100], Step: [256/562], Loss: 4.947429656982422, Validation
Acc:0.0939060939060939
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [3/100], Step: [320/562], Loss: 3.753892660140991, Validation
Acc:0.0989010989010989
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [3/100], Step: [384/562], Loss: 4.555296897888184, Validation
Acc:0.1048951048951049
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [3/100], Step: [448/562], Loss: 5.081062316894531, Validation
Acc:0.11788211788211789
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [3/100], Step: [512/562], Loss: 4.448763847351074, Validation
Acc:0.12287712287712288
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
```

```
        [ 0.2192, -0.0281,  0.0366,  …,  0.4491, -0.7510, -1.5058],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [64/562], Loss: 4.252955913543701, Validation
Acc:0.13386613386613386
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [128/562], Loss: 3.9820261001586914, Validation
Acc:0.14585414585414586
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [192/562], Loss: 4.250160217285156, Validation
Acc:0.15184815184815184
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [256/562], Loss: 4.585037708282471, Validation
Acc:0.16083916083916083
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [320/562], Loss: 3.970165252685547, Validation
Acc:0.16383616383616384
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [384/562], Loss: 3.719221591949463, Validation
Acc:0.16783216783216784
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [448/562], Loss: 3.6277413368225098, Validation
Acc:0.17682317682317683
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [4/100], Step: [512/562], Loss: 3.5760841369628906, Validation
Acc:0.1918081918081918
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [ 0.0777,  0.1746,  0.1472,  …,  0.5085, -0.7554, -1.4657],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [64/562], Loss: 4.295453071594238, Validation
Acc:0.1978021978021978
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [128/562], Loss: 5.460681915283203, Validation
Acc:0.2077922077922078
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [192/562], Loss: 3.1497225761413574, Validation
Acc:0.21478521478521478
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [256/562], Loss: 2.6605029106140137, Validation
Acc:0.22077922077922077
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [320/562], Loss: 3.203829288482666, Validation
```

```
Acc:0.22577422577422576
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [384/562], Loss: 3.3673744201660156, Validation
Acc:0.23776223776223776
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [448/562], Loss: 2.9327573776245117, Validation
Acc:0.24075924075924077
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [5/100], Step: [512/562], Loss: 3.338696241378784, Validation
Acc:0.24875124875124874
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.0289,  0.3570,  0.2200,  …,  0.5505, -0.7834, -1.4319],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [6/100], Step: [64/562], Loss: 3.089398145675659, Validation
Acc:0.2627372627372627
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [6/100], Step: [128/562], Loss: 2.1346540451049805, Validation
Acc:0.26873126873126874
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [6/100], Step: [192/562], Loss: 3.4482946395874023, Validation
Acc:0.27472527472527475
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [6/100], Step: [256/562], Loss: 2.5318775177001953, Validation
Acc:0.2827172827172827
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [6/100], Step: [320/562], Loss: 3.135131597518921, Validation
Acc:0.2947052947052947
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [6/100], Step: [384/562], Loss: 2.9359962940216064, Validation
Acc:0.2997002997002997
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [6/100], Step: [448/562], Loss: 2.4633336067199707, Validation
Acc:0.3086913086913087
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [6/100], Step: [512/562], Loss: 2.2026047706604004, Validation
Acc:0.3146853146853147
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.1090,  0.5040,  0.2650,  …,  0.5911, -0.8105, -1.3924],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [7/100], Step: [64/562], Loss: 2.9822418689727783, Validation
Acc:0.33166833166833165
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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```

```
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```
Epoch: [7/100], Step: [128/562], Loss: 3.3546955585479736, Validation
Acc:0.3356643356643357
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
```
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```
Epoch: [7/100], Step: [192/562], Loss: 2.177194118499756, Validation
Acc:0.3386613386613387
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
```
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```
Epoch: [7/100], Step: [256/562], Loss: 2.227919578552246, Validation
Acc:0.34765234765234765
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
```
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```
Epoch: [7/100], Step: [320/562], Loss: 2.3762335777282715, Validation
Acc:0.35264735264735264
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
```
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```
Epoch: [7/100], Step: [384/562], Loss: 2.172266960144043, Validation
Acc:0.3546453546453546
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [7/100], Step: [448/562], Loss: 2.444002628326416, Validation
Acc:0.36163836163836166
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [7/100], Step: [512/562], Loss: 1.935712218284607, Validation
Acc:0.36563436563436563
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.1946,  0.6209,  0.2895,  …,  0.6241, -0.8167, -1.3683],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [64/562], Loss: 2.379795551300049, Validation
Acc:0.3706293706293706
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [128/562], Loss: 2.4432549476623535, Validation
Acc:0.37962037962037964

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
```

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [192/562], Loss: 2.1208553314208984, Validation
Acc:0.37962037962037964
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [256/562], Loss: 1.7819600105285645, Validation
Acc:0.38461538461538464

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,

```
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [320/562], Loss: 2.4746270179748535, Validation
Acc:0.3936063936063936
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [384/562], Loss: 2.0642757415771484, Validation
Acc:0.3956043956043956

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [448/562], Loss: 2.251962184906006, Validation
Acc:0.4015984015984016
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [8/100], Step: [512/562], Loss: 2.449441432952881, Validation
Acc:0.4095904095904096
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.2421,  0.7109,  0.2977,  …,  0.6302, -0.8202, -1.3300],
```

```
          …,
          [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
          [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
          [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
        device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [64/562], Loss: 3.300069808959961, Validation
Acc:0.4125874125874126

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [128/562], Loss: 2.287144184112549, Validation
Acc:0.4205794205794206
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [192/562], Loss: 2.190784454345703, Validation
Acc:0.42357642357642356

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
```

```
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [256/562], Loss: 2.4325098991394043, Validation
Acc:0.4245754245754246
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [320/562], Loss: 1.8162997961044312, Validation
Acc:0.4245754245754246

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
            72, 73, 74, 75, 76])
Epoch: [9/100], Step: [384/562], Loss: 2.0708982944488525, Validation
Acc:0.42857142857142855
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [448/562], Loss: 2.0099992752075195, Validation
Acc:0.4355644355644356

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [9/100], Step: [512/562], Loss: 2.661712884902954, Validation
Acc:0.43756243756243757
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.2804,  0.7940,  0.2912,  …,  0.6612, -0.8391, -1.3136],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
```

```
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [10/100], Step: [64/562], Loss: 2.330639123916626, Validation
Acc:0.4435564435564436
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [10/100], Step: [128/562], Loss: 2.070521831512451, Validation
Acc:0.44955044955044954

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [10/100], Step: [192/562], Loss: 2.2262306213378906, Validation
Acc:0.45254745254745254
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [10/100], Step: [256/562], Loss: 1.8330405950546265, Validation
Acc:0.45454545454545453

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
```

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [10/100], Step: [320/562], Loss: 2.1225576400756836, Validation
Acc:0.45254745254745254
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [10/100], Step: [384/562], Loss: 2.1295061111450195, Validation
Acc:0.45754245754245754

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,

```
          72, 73, 74, 75, 76])
Epoch: [10/100], Step: [448/562], Loss: 2.6734609603881836, Validation
Acc:0.46053946053946054
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [10/100], Step: [512/562], Loss: 2.749788284301758, Validation
Acc:0.4595404595404595

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.3164,  0.8601,  0.2790,  …,  0.6565, -0.8298, -1.3004],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [11/100], Step: [64/562], Loss: 1.3493850231170654, Validation
Acc:0.46653346653346656

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```

```
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [128/562], Loss: 2.1615662574768066, Validation
Acc:0.47052947052947053
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [192/562], Loss: 2.2999119758605957, Validation
Acc:0.4755244755244755

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [256/562], Loss: 1.9703725576400757, Validation
Acc:0.4785214785214785
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [320/562], Loss: 2.0273892879486084, Validation
Acc:0.47952047952047955
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [384/562], Loss: 2.104094982147217, Validation
Acc:0.4825174825174825
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [448/562], Loss: 1.947309970855713, Validation
Acc:0.4865134865134865
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [11/100], Step: [512/562], Loss: 1.2828537225723267, Validation
Acc:0.4865134865134865
[Parameter containing:
tensor([[0.0000, 0.0000, 0.0000, …, 0.0000, 0.0000, 0.0000],
        [0.2880, -0.5765, 0.1340, …, -0.0300, 0.3268, -0.7425],
        [-0.3355, 0.9229, 0.2663, …, 0.6664, -0.8308, -1.2900],
        …,
        [1.4538, -1.1602, -0.1184, …, 1.0373, 2.3059, -0.4485],
        [0.6495, -0.6303, 0.1053, …, 0.2994, 0.5924, -0.4854],
        [0.2241, 1.7852, -0.0807, …, -2.4700, 1.1103, 0.2524]],
        device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

Epoch: [12/100], Step: [64/562], Loss: 1.8072669506072998, Validation
Acc:0.4955044955044955
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [128/562], Loss: 1.983638882637024, Validation
Acc:0.4975024975024975
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [192/562], Loss: 1.9129564762115479, Validation
Acc:0.4985014985014985
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [256/562], Loss: 1.8118295669555664, Validation
Acc:0.5014985014985015

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [320/562], Loss: 1.6332244873046875, Validation
Acc:0.5024975024975025
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [384/562], Loss: 1.670886754989624, Validation
Acc:0.5074925074925075
```

```
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [448/562], Loss: 2.2406697273254395, Validation
Acc:0.5064935064935064
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [12/100], Step: [512/562], Loss: 2.0910496711730957, Validation
Acc:0.5124875124875125
```

```
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
```

```
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.3573,  0.9825,  0.2531,  …,  0.6518, -0.8255, -1.2838],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [64/562], Loss: 1.5453681945800781, Validation
Acc:0.5184815184815185

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [128/562], Loss: 1.7724648714065552, Validation
Acc:0.5184815184815185
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
```

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [192/562], Loss: 1.7840144634246826, Validation
Acc:0.5194805194805194

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [256/562], Loss: 2.0634076595306396, Validation
Acc:0.5214785214785215
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [320/562], Loss: 1.8559128046035767, Validation
Acc:0.5234765234765235

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```

```
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [384/562], Loss: 1.5145723819732666, Validation
Acc:0.5234765234765235
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [448/562], Loss: 1.5512280464172363, Validation
Acc:0.5264735264735265

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [13/100], Step: [512/562], Loss: 2.244940757751465, Validation
Acc:0.5274725274725275
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.3669,  1.0230,  0.2386,  …,  0.6628, -0.8220, -1.2852],
        …,
```

```
           [ 1.4538, -1.1602, -0.1184,  …,   1.0373,  2.3059, -0.4485],
           [ 0.6495, -0.6303,  0.1053,  …,   0.2994,  0.5924, -0.4854],
           [ 0.2241,  1.7852, -0.0807,  …,  -2.4700,  1.1103,  0.2524]],
         device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [64/562], Loss: 1.0246670246124268, Validation
Acc:0.5354645354645354
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [128/562], Loss: 1.5323845148086548, Validation
Acc:0.5404595404595405

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [192/562], Loss: 1.0327138900756836, Validation
Acc:0.5404595404595405
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
```

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [256/562], Loss: 1.9730725288391113, Validation
Acc:0.5444555444555444

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [320/562], Loss: 1.3823113441467285, Validation
Acc:0.5424575424575424
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [384/562], Loss: 1.7428724765777588, Validation
Acc:0.5494505494505495

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```

```
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [448/562], Loss: 1.3486565351486206, Validation
Acc:0.5464535464535465
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [14/100], Step: [512/562], Loss: 1.5177183151245117, Validation
Acc:0.5524475524475524

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.3939,  1.0605,  0.2266,  …,  0.6546, -0.8246, -1.2999],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
```

```
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [64/562], Loss: 2.1328413486480713, Validation
Acc:0.5514485514485514

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [128/562], Loss: 1.5300285816192627, Validation
Acc:0.5524475524475524
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [192/562], Loss: 1.7091103792190552, Validation
Acc:0.5554445554445554

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [256/562], Loss: 2.1079940795898438, Validation
Acc:0.5594405594405595
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [320/562], Loss: 1.9114010334014893, Validation
Acc:0.5634365634365635

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [384/562], Loss: 1.1013226509094238, Validation
Acc:0.5654345654345654
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [448/562], Loss: 1.07569420337677, Validation
```

```
Acc:0.5674325674325674

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [15/100], Step: [512/562], Loss: 2.0139050483703613, Validation
Acc:0.5704295704295704
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.3991,  1.0940,  0.2120,  …,  0.6432, -0.8259, -1.3067],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [64/562], Loss: 1.4974786043167114, Validation
Acc:0.5704295704295704
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
           72, 73, 74, 75, 76])
Epoch: [16/100], Step: [128/562], Loss: 1.208569049835205, Validation
Acc:0.5744255744255744

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [192/562], Loss: 2.0442001819610596, Validation
Acc:0.5754245754245755
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [256/562], Loss: 2.869320869445801, Validation
Acc:0.5764235764235764

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
```

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [320/562], Loss: 1.6801356077194214, Validation
Acc:0.5754245754245755
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [384/562], Loss: 1.449939489364624, Validation
Acc:0.5774225774225774

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [448/562], Loss: 1.8021334409713745, Validation
Acc:0.5794205794205795
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [16/100], Step: [512/562], Loss: 2.365391492843628, Validation
Acc:0.5804195804195804
```

```
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4107,  1.1310,  0.1945,  …,  0.6429, -0.8229, -1.3086],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [17/100], Step: [64/562], Loss: 1.5493626594543457, Validation
Acc:0.5814185814185814

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
          72, 73, 74, 75, 76])
Epoch: [17/100], Step: [128/562], Loss: 0.7540189027786255, Validation
Acc:0.5824175824175825
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [17/100], Step: [192/562], Loss: 0.7926272749900818, Validation
Acc:0.5854145854145855

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [17/100], Step: [256/562], Loss: 1.425744652748108, Validation
Acc:0.5884115884115884
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [17/100], Step: [320/562], Loss: 1.3666560649871826, Validation
Acc:0.5894105894105894

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
```

behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [17/100], Step: [384/562], Loss: 2.0744709968566895, Validation
Acc:0.5894105894105894
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [17/100], Step: [448/562], Loss: 2.0392990112304688, Validation
Acc:0.5924075924075924

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [17/100], Step: [512/562], Loss: 0.640215277671814, Validation

```
Acc:0.5924075924075924
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4143,  1.1618,  0.1851,  …,  0.6534, -0.8288, -1.3166],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [64/562], Loss: 1.6219979524612427, Validation
Acc:0.5934065934065934
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [128/562], Loss: 0.8851408362388611, Validation
Acc:0.5974025974025974

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
             72, 73, 74, 75, 76])
Epoch: [18/100], Step: [192/562], Loss: 1.0911972522735596, Validation
Acc:0.6023976023976024
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [256/562], Loss: 1.0725281238555908, Validation
Acc:0.6053946053946054
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [320/562], Loss: 1.595459222793579, Validation
Acc:0.6023976023976024
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [384/562], Loss: 0.7398297786712646, Validation
Acc:0.6013986013986014
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this

```
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [448/562], Loss: 1.7902934551239014, Validation
Acc:0.6063936063936064
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [18/100], Step: [512/562], Loss: 1.3339921236038208, Validation
Acc:0.6083916083916084

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4171,  1.1860,  0.1760,  …,  0.6627, -0.8296, -1.3227],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [64/562], Loss: 1.4654268026351929, Validation
Acc:0.6113886113886113
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [128/562], Loss: 2.1716580390930176, Validation
Acc:0.6113886113886113
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [192/562], Loss: 1.8944473266601562, Validation
Acc:0.6143856143856143
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [256/562], Loss: 0.8428587913513184, Validation
Acc:0.6133866133866134
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [320/562], Loss: 1.134782314300537, Validation
Acc:0.6133866133866134

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [384/562], Loss: 0.6815828084945679, Validation
Acc:0.6153846153846154
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [448/562], Loss: 0.9116142988204956, Validation
Acc:0.6163836163836164
```

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [19/100], Step: [512/562], Loss: 0.8283405900001526, Validation
Acc:0.6193806193806194
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4219,  1.2081,  0.1674,  …,  0.6516, -0.8334, -1.3225],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [64/562], Loss: 1.0644891262054443, Validation
Acc:0.6173826173826173
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [128/562], Loss: 1.5412359237670898, Validation
Acc:0.6233766233766234

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [192/562], Loss: 1.355147123336792, Validation
Acc:0.6203796203796204
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [256/562], Loss: 1.594036340713501, Validation
Acc:0.6223776223776224

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
```

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [320/562], Loss: 1.238459825515747, Validation
Acc:0.6253746253746254
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [384/562], Loss: 0.9743531942367554, Validation
Acc:0.6273726273726273

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [448/562], Loss: 0.9273552298545837, Validation
Acc:0.6253746253746254
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [20/100], Step: [512/562], Loss: 1.6116317510604858, Validation
Acc:0.6273726273726273

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4368,  1.2292,  0.1581,  …,  0.6542, -0.8430, -1.3217],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [21/100], Step: [64/562], Loss: 1.660295009613037, Validation
Acc:0.6273726273726273

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```

```
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [21/100], Step: [128/562], Loss: 0.8014283180236816, Validation
Acc:0.6273726273726273
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [21/100], Step: [192/562], Loss: 0.9783584475517273, Validation
Acc:0.6263736263736264

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
```
    _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [21/100], Step: [256/562], Loss: 0.8045714497566223, Validation
Acc:0.6273726273726273
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,

```
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [21/100], Step: [320/562], Loss: 1.0479201078414917, Validation
Acc:0.6323676323676324

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```

Streaming output truncated to the last 5000 lines.

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [32/100], Step: [320/562], Loss: 1.1547619104385376, Validation
Acc:0.7162837162837162
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [32/100], Step: [384/562], Loss: 0.444607675075531, Validation
Acc:0.7162837162837162
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [32/100], Step: [448/562], Loss: 0.8993282914161682, Validation
Acc:0.7162837162837162
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [32/100], Step: [512/562], Loss: 0.7515904307365417, Validation
Acc:0.7172827172827173
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4859,  1.3843,  0.0796,  …,  0.6876, -0.9125, -1.3020],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [64/562], Loss: 0.7251447439193726, Validation
Acc:0.7172827172827173
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [128/562], Loss: 1.1084328889846802, Validation
Acc:0.7172827172827173
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [192/562], Loss: 1.5362584590911865, Validation
Acc:0.7152847152847153
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [256/562], Loss: 0.7546501755714417, Validation
Acc:0.7192807192807192
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [320/562], Loss: 1.0405343770980835, Validation
Acc:0.7202797202797203
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [384/562], Loss: 0.7321517467498779, Validation
Acc:0.7212787212787213
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [448/562], Loss: 0.9281662702560425, Validation
Acc:0.7182817182817183
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [33/100], Step: [512/562], Loss: 0.573840320110321, Validation
```

```
Acc:0.7182817182817183
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4978,  1.3924,  0.0746,  …,  0.7031, -0.9187, -1.3012],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [64/562], Loss: 1.022355556488037, Validation
Acc:0.7202797202797203
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [128/562], Loss: 1.1246757507324219, Validation
Acc:0.7222777222777222
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [192/562], Loss: 0.708649754524231, Validation
Acc:0.7232767232767233
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [34/100], Step: [256/562], Loss: 0.7962393760681152, Validation
Acc:0.7222777222777222
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [320/562], Loss: 0.6133764982223511, Validation
Acc:0.7202797202797203
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [384/562], Loss: 0.48191383481025696, Validation
Acc:0.7232767232767233
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [448/562], Loss: 0.8956863880157471, Validation
Acc:0.7212787212787213
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [34/100], Step: [512/562], Loss: 0.8871107697486877, Validation
Acc:0.7252747252747253
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4976,  1.4006,  0.0698,  …,  0.7041, -0.9249, -1.2977],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
```

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           [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
           [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
         device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [35/100], Step: [64/562], Loss: 0.815310001373291, Validation
Acc:0.7242757242757243
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [35/100], Step: [128/562], Loss: 0.4277551472187042, Validation
Acc:0.7232767232767233
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [35/100], Step: [192/562], Loss: 0.9801857471466064, Validation
Acc:0.7252747252747253
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [35/100], Step: [256/562], Loss: 0.5161278247833252, Validation
Acc:0.7242757242757243
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [35/100], Step: [320/562], Loss: 0.9171403050422668, Validation
Acc:0.7272727272727273
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [35/100], Step: [384/562], Loss: 0.9910497069358826, Validation
Acc:0.7252747252747253
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [35/100], Step: [448/562], Loss: 1.2792731523513794, Validation
Acc:0.7282717282717283
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
          18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [35/100], Step: [512/562], Loss: 0.7750214338302612, Validation
Acc:0.7282717282717283
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.4955,  1.4104,  0.0636,  …,  0.7122, -0.9309, -1.2963],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [64/562], Loss: 1.1048974990844727, Validation
Acc:0.7272727272727273
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [128/562], Loss: 0.46478673815727234, Validation
Acc:0.7252747252747253
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [192/562], Loss: 1.0380362272262573, Validation
Acc:0.7262737262737263
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [256/562], Loss: 0.7923328876495361, Validation
Acc:0.7272727272727273
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [320/562], Loss: 2.3792452812194824, Validation
Acc:0.7282717282717283
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [384/562], Loss: 0.9947962760925293, Validation
Acc:0.7332667332667333
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [448/562], Loss: 0.885619044303894, Validation
Acc:0.7292707292707292
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [36/100], Step: [512/562], Loss: 0.39645153284072876, Validation
Acc:0.7322677322677322
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5026,  1.4173,  0.0577,  …,  0.7193, -0.9342, -1.2980],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [64/562], Loss: 0.9940694570541382, Validation
Acc:0.7302697302697303
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [128/562], Loss: 0.7340731024742126, Validation
Acc:0.7322677322677322
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [192/562], Loss: 0.7471722364425659, Validation
Acc:0.7322677322677322
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [256/562], Loss: 0.973035454750061, Validation
Acc:0.7322677322677322
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [320/562], Loss: 0.9162933826446533, Validation
Acc:0.7332667332667333
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [384/562], Loss: 0.38864171504974365, Validation
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Acc:0.7342657342657343
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [448/562], Loss: 1.5906639099121094, Validation
Acc:0.7332667332667333
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [37/100], Step: [512/562], Loss: 0.3091179132461548, Validation
Acc:0.7342657342657343
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5007,  1.4269,  0.0529,  …,  0.7136, -0.9407, -1.2883],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [64/562], Loss: 0.6519990563392639, Validation
Acc:0.7352647352647352
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
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Epoch: [38/100], Step: [128/562], Loss: 0.5730100870132446, Validation
Acc:0.7352647352647352
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [192/562], Loss: 0.8224003911018372, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [256/562], Loss: 0.8108839988708496, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [320/562], Loss: 0.9275825619697571, Validation
Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [384/562], Loss: 1.1941906213760376, Validation
Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [448/562], Loss: 0.5266308784484863, Validation
Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [38/100], Step: [512/562], Loss: 1.0575312376022339, Validation
Acc:0.7372627372627373
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5002,  1.4329,  0.0480,  …,  0.7227, -0.9477, -1.2837],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [39/100], Step: [64/562], Loss: 1.3920111656188965, Validation
Acc:0.7352647352647352
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [39/100], Step: [128/562], Loss: 0.9012475609779358, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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       54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
       72, 73, 74, 75, 76])
Epoch: [39/100], Step: [192/562], Loss: 1.0111912488937378, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
       18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
       36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
       54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
       72, 73, 74, 75, 76])
Epoch: [39/100], Step: [256/562], Loss: 0.9655733108520508, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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       36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
       54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
       72, 73, 74, 75, 76])
Epoch: [39/100], Step: [320/562], Loss: 1.2380062341690063, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
       18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
       36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
       54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
       72, 73, 74, 75, 76])
Epoch: [39/100], Step: [384/562], Loss: 0.6236822605133057, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
       18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
       36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
       54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
       72, 73, 74, 75, 76])
Epoch: [39/100], Step: [448/562], Loss: 0.9817376136779785, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [39/100], Step: [512/562], Loss: 0.5052779912948608, Validation
Acc:0.7362637362637363
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5016,  1.4369,  0.0421,  …,  0.7414, -0.9528, -1.2806],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [64/562], Loss: 0.4644640386104584, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [128/562], Loss: 0.7494746446609497, Validation
Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [192/562], Loss: 0.5230339765548706, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [256/562], Loss: 0.19020965695381165, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [320/562], Loss: 0.8665438294410706, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [384/562], Loss: 0.4964761435985565, Validation
Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [448/562], Loss: 0.7244981527328491, Validation
Acc:0.7392607392607392
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [40/100], Step: [512/562], Loss: 0.6786466240882874, Validation
Acc:0.7372627372627373
```

```
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5053,  1.4443,  0.0378,  …,  0.7362, -0.9577, -1.2781],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [64/562], Loss: 0.3535136878490448, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [128/562], Loss: 0.7049779891967773, Validation
Acc:0.7362637362637363
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [192/562], Loss: 0.9652986526489258, Validation
Acc:0.7372627372627373
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [256/562], Loss: 0.4648015797138214, Validation
```

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Acc:0.7382617382617382
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [320/562], Loss: 0.8575276136398315, Validation
Acc:0.7422577422577422
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [384/562], Loss: 0.549685537815094, Validation
Acc:0.7392607392607392
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [448/562], Loss: 0.3708423972129822, Validation
Acc:0.7392607392607392
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [41/100], Step: [512/562], Loss: 1.128269076347351, Validation
Acc:0.7402597402597403
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5076,  1.4482,  0.0330,  …,  0.7478, -0.9635, -1.2774],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
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        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [64/562], Loss: 0.8760151863098145, Validation
Acc:0.7412587412587412
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [128/562], Loss: 0.8304972648620605, Validation
Acc:0.7442557442557443
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [192/562], Loss: 0.5596838593482971, Validation
Acc:0.7422577422577422
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [256/562], Loss: 0.606895923614502, Validation
Acc:0.7442557442557443
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [320/562], Loss: 0.4434449374675751, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [384/562], Loss: 0.7846013903617859, Validation
Acc:0.7422577422577422
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [448/562], Loss: 0.99430912733078, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [42/100], Step: [512/562], Loss: 1.9722330570220947, Validation
Acc:0.7432567432567433
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5145,  1.4558,  0.0291,  …,  0.7501, -0.9681, -1.2729],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [43/100], Step: [64/562], Loss: 0.5637034177780151, Validation
Acc:0.7422577422577422
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [43/100], Step: [128/562], Loss: 0.9575678110122681, Validation
Acc:0.7442557442557443
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [43/100], Step: [192/562], Loss: 0.5550990104675293, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [43/100], Step: [256/562], Loss: 0.7527445554733276, Validation
Acc:0.7442557442557443
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [43/100], Step: [320/562], Loss: 0.911194384098053, Validation
Acc:0.7432567432567433
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [43/100], Step: [384/562], Loss: 1.5802747011184692, Validation
Acc:0.7422577422577422
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [43/100], Step: [448/562], Loss: 0.41228801012039185, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [43/100], Step: [512/562], Loss: 0.5067885518074036, Validation
Acc:0.7462537462537463
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5185,  1.4622,  0.0252,  …,  0.7522, -0.9748, -1.2722],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [64/562], Loss: 0.6011244058609009, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [128/562], Loss: 0.5023676753044128, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [192/562], Loss: 1.139397144317627, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [256/562], Loss: 0.6438024640083313, Validation
Acc:0.7482517482517482
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [320/562], Loss: 1.3422857522964478, Validation
Acc:0.7432567432567433
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [384/562], Loss: 0.8789476752281189, Validation
Acc:0.7452547452547452
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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [448/562], Loss: 0.5135245323181152, Validation
Acc:0.7432567432567433
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [44/100], Step: [512/562], Loss: 1.0386282205581665, Validation
Acc:0.7462537462537463
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5177,  1.4649,  0.0210,  …,  0.7583, -0.9795, -1.2711],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [64/562], Loss: 0.3425944447517395, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [128/562], Loss: 1.2811959981918335, Validation
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Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [192/562], Loss: 1.1122996807098389, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [256/562], Loss: 1.0730092525482178, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [320/562], Loss: 1.06721031665802, Validation
Acc:0.7452547452547452
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [384/562], Loss: 0.5833667516708374, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

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        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [448/562], Loss: 0.594692051410675, Validation
Acc:0.7462537462537463
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [45/100], Step: [512/562], Loss: 0.4892778992652893, Validation
Acc:0.7472527472527473
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5189,  1.4706,  0.0161,  …,  0.7589, -0.9848, -1.2643],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [64/562], Loss: 0.31250834465026855, Validation
Acc:0.7482517482517482
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [128/562], Loss: 0.32371336221694946, Validation
Acc:0.7502497502497503
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [192/562], Loss: 0.5322399139404297, Validation
Acc:0.7532467532467533
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [256/562], Loss: 0.4105716645717621, Validation
Acc:0.7522477522477522
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [320/562], Loss: 0.5519269704818726, Validation
Acc:0.7492507492507493
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [384/562], Loss: 0.8696481585502625, Validation
Acc:0.7492507492507493
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [448/562], Loss: 0.7341917753219604, Validation
Acc:0.7492507492507493
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [46/100], Step: [512/562], Loss: 0.7103564739227295, Validation
Acc:0.7502497502497503
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5162,  1.4765,  0.0117,  …,  0.7614, -0.9895, -1.2627],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [64/562], Loss: 0.2991718351840973, Validation
Acc:0.7512487512487512
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [128/562], Loss: 0.23225551843643188, Validation
Acc:0.7512487512487512
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [192/562], Loss: 0.5751906633377075, Validation
Acc:0.7492507492507493
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [256/562], Loss: 0.5109018087387085, Validation
Acc:0.7512487512487512
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [320/562], Loss: 0.5817709565162659, Validation
Acc:0.7502497502497503
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [384/562], Loss: 0.5354887843132019, Validation
Acc:0.7522477522477522
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [448/562], Loss: 0.3809937536716461, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [47/100], Step: [512/562], Loss: 0.9996989965438843, Validation
Acc:0.7522477522477522
[Parameter containing:
```

```
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5161,  1.4811,  0.0077,  …,  0.7712, -0.9936, -1.2539],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [64/562], Loss: 1.046114444732666, Validation
Acc:0.7532467532467533
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [128/562], Loss: 0.36587804555892944, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [192/562], Loss: 0.4153995215892792, Validation
Acc:0.7532467532467533
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [256/562], Loss: 0.6688780784606934, Validation
Acc:0.7552447552447552
```

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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [320/562], Loss: 0.40494105219841003, Validation
Acc:0.7532467532467533
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [384/562], Loss: 0.7025254964828491, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [448/562], Loss: 0.756414532661438, Validation
Acc:0.7532467532467533
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [48/100], Step: [512/562], Loss: 0.7427074909210205, Validation
Acc:0.7572427572427572
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5188,  1.4835,  0.0029,  …,  0.7717, -0.9988, -1.2529],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
```

```
        device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [64/562], Loss: 0.4822079539299011, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [128/562], Loss: 0.3243925869464874, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [192/562], Loss: 0.26809147000312805, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [256/562], Loss: 0.8161225914955139, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
            72, 73, 74, 75, 76])
Epoch: [49/100], Step: [320/562], Loss: 0.5970287322998047, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [384/562], Loss: 0.6632533669471741, Validation
Acc:0.7562437562437563
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [448/562], Loss: 0.16703933477401733, Validation
Acc:0.7542457542457542
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [49/100], Step: [512/562], Loss: 0.7978601455688477, Validation
Acc:0.7542457542457542
[Parameter containing:
tensor([[ 0.0000e+00,  0.0000e+00,  0.0000e+00,  …,  0.0000e+00,
          0.0000e+00,  0.0000e+00],
        [ 2.8802e-01, -5.7647e-01,  1.3401e-01,  …, -2.9968e-02,
          3.2677e-01, -7.4247e-01],
        [-5.1853e-01,  1.4900e+00, -1.8905e-03,  …,  7.7395e-01,
         -1.0039e+00, -1.2514e+00],
        …,
        [ 1.4538e+00, -1.1602e+00, -1.1839e-01,  …,  1.0373e+00,
          2.3059e+00, -4.4850e-01],
        [ 6.4946e-01, -6.3035e-01,  1.0531e-01,  …,  2.9940e-01,
          5.9243e-01, -4.8544e-01],
        [ 2.2408e-01,  1.7852e+00, -8.0650e-02,  …, -2.4700e+00,
          1.1103e+00,  2.5242e-01]], device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [64/562], Loss: 0.8706645965576172, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [128/562], Loss: 0.9135700464248657, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [192/562], Loss: 0.6151453852653503, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [256/562], Loss: 1.2521347999572754, Validation
Acc:0.7612387612387612
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [320/562], Loss: 0.2738904654979706, Validation
```

```
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [384/562], Loss: 0.7012485861778259, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [448/562], Loss: 0.6495892405509949, Validation
Acc:0.7592407592407593
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [50/100], Step: [512/562], Loss: 0.9007185697555542, Validation
Acc:0.7602397602397603
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5210,  1.4945, -0.0056,  …,  0.7870, -1.0082, -1.2508],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [51/100], Step: [64/562], Loss: 0.3030291795730591, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [128/562], Loss: 0.32211118936538696, Validation
Acc:0.7622377622377622
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [192/562], Loss: 0.7098621129989624, Validation
Acc:0.7632367632367633
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [256/562], Loss: 0.5987460017204285, Validation
Acc:0.7642357642357642
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [320/562], Loss: 0.6424199342727661, Validation
Acc:0.7632367632367633
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [384/562], Loss: 0.6742544770240784, Validation
Acc:0.7632367632367633
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [448/562], Loss: 0.5014501214027405, Validation
Acc:0.7612387612387612
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [51/100], Step: [512/562], Loss: 0.5641608834266663, Validation
Acc:0.7602397602397603
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5236,  1.4988, -0.0093,  …,  0.7875, -1.0147, -1.2487],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [64/562], Loss: 0.38243842124938965, Validation
Acc:0.7612387612387612
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
```

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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [128/562], Loss: 0.3656451106071472, Validation
Acc:0.7612387612387612
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [192/562], Loss: 0.3243638575077057, Validation
Acc:0.7592407592407593
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [256/562], Loss: 1.054735541343689, Validation
Acc:0.7592407592407593
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [320/562], Loss: 0.5194665193557739, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [384/562], Loss: 0.45183470845222473, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [448/562], Loss: 0.27878350019454956, Validation
Acc:0.7602397602397603
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [52/100], Step: [512/562], Loss: 1.169094204902649, Validation
Acc:0.7612387612387612
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5255,  1.5043, -0.0130,  …,  0.7886, -1.0195, -1.2476],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [64/562], Loss: 0.8587568402290344, Validation
Acc:0.7592407592407593
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [128/562], Loss: 0.7187284231185913, Validation
Acc:0.7592407592407593
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [192/562], Loss: 0.63643479347229, Validation
Acc:0.7612387612387612
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [256/562], Loss: 1.0399388074874878, Validation
Acc:0.7622377622377622
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [320/562], Loss: 0.9065602421760559, Validation
Acc:0.7632367632367633
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [384/562], Loss: 0.41382932662963867, Validation
Acc:0.7622377622377622
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [448/562], Loss: 1.109570860862732, Validation
Acc:0.7632367632367633
```

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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [53/100], Step: [512/562], Loss: 0.7542966604232788, Validation
Acc:0.7632367632367633
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5260,  1.5075, -0.0170,  …,  0.7929, -1.0242, -1.2450],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [64/562], Loss: 1.0729355812072754, Validation
Acc:0.7642357642357642
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [128/562], Loss: 0.588984489440918, Validation
Acc:0.7662337662337663
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [192/562], Loss: 0.8383297324180603, Validation
```

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Acc:0.7652347652347652
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [256/562], Loss: 0.8207315802574158, Validation
Acc:0.7662337662337663
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [320/562], Loss: 0.8938599824905396, Validation
Acc:0.7662337662337663
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [384/562], Loss: 0.9718424081802368, Validation
Acc:0.7652347652347652
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [448/562], Loss: 0.49457764625549316, Validation
Acc:0.7662337662337663
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
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        72, 73, 74, 75, 76])
Epoch: [54/100], Step: [512/562], Loss: 0.4359394907951355, Validation
Acc:0.7662337662337663
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5301,  1.5101, -0.0211,  …,  0.7972, -1.0274, -1.2441],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [64/562], Loss: 0.5724811553955078, Validation
Acc:0.7662337662337663
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [128/562], Loss: 0.5000004768371582, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [192/562], Loss: 0.19621047377586365, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [256/562], Loss: 0.26921331882476807, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [320/562], Loss: 0.32478976249694824, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [384/562], Loss: 0.6068128347396851, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [448/562], Loss: 0.9599674940109253, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [55/100], Step: [512/562], Loss: 0.30328184366226196, Validation
Acc:0.7682317682317682
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5306,  1.5130, -0.0251,  …,  0.8018, -1.0318, -1.2438],
```

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        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [64/562], Loss: 1.0416818857192993, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [128/562], Loss: 0.9341030120849609, Validation
Acc:0.7672327672327672
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [192/562], Loss: 0.21033447980880737, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [256/562], Loss: 0.36696118116378784, Validation
Acc:0.7682317682317682
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [320/562], Loss: 0.8862051963806152, Validation
Acc:0.7682317682317682
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [384/562], Loss: 0.19477145373821259, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [448/562], Loss: 0.2709183692932129, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [56/100], Step: [512/562], Loss: 0.7566137313842773, Validation
Acc:0.7692307692307693
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5317,  1.5170, -0.0285,  …,  0.8129, -1.0355, -1.2412],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [64/562], Loss: 0.8489684462547302, Validation
Acc:0.7672327672327672
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [128/562], Loss: 0.5766937732696533, Validation
Acc:0.7672327672327672
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [192/562], Loss: 0.42946016788482666, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [256/562], Loss: 0.6235679984092712, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [320/562], Loss: 0.5413945913314819, Validation
Acc:0.7702297702297702
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [384/562], Loss: 0.8211206793785095, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [448/562], Loss: 0.6045078635215759, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [57/100], Step: [512/562], Loss: 0.4600694179534912, Validation
Acc:0.7702297702297702
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5332,  1.5186, -0.0325,  …,  0.8155, -1.0402, -1.2390],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [64/562], Loss: 0.4411070644855499, Validation
```

```
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [128/562], Loss: 0.30247193574905396, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [192/562], Loss: 0.9250353574752808, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [256/562], Loss: 0.2426186203956604, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [320/562], Loss: 0.46296054124832153, Validation
Acc:0.7692307692307693
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
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        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [384/562], Loss: 0.22243990004062653, Validation
Acc:0.7682317682317682
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [448/562], Loss: 0.6589150428771973, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [58/100], Step: [512/562], Loss: 0.657157301902771, Validation
Acc:0.7702297702297702
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5358,  1.5225, -0.0360,  …,  0.8163, -1.0440, -1.2364],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [64/562], Loss: 0.1444167196750641, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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```

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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [128/562], Loss: 0.35031235218048096, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [192/562], Loss: 0.9655033349990845, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [256/562], Loss: 0.7407478094100952, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [320/562], Loss: 0.5167065858840942, Validation
Acc:0.7702297702297702
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [384/562], Loss: 0.34296882152557373, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [448/562], Loss: 0.5400859117507935, Validation
Acc:0.7722277722277723
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [59/100], Step: [512/562], Loss: 1.0007953643798828, Validation
Acc:0.7712287712287712
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5325,  1.5246, -0.0400,  …,  0.8132, -1.0466, -1.2336],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [64/562], Loss: 0.7520911693572998, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [128/562], Loss: 0.1905006985092163, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [192/562], Loss: 0.45093345642089844, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [256/562], Loss: 0.30726003646850586, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [320/562], Loss: 0.812997579574585, Validation
Acc:0.7712287712287712
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [384/562], Loss: 0.5776722431182861, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [448/562], Loss: 0.22713178396224976, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
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labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [60/100], Step: [512/562], Loss: 0.5457553863525391, Validation
Acc:0.7732267732267732
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5307,  1.5242, -0.0438,  …,  0.8276, -1.0506, -1.2328],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [64/562], Loss: 0.5702952742576599, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [128/562], Loss: 0.9167374968528748, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [192/562], Loss: 0.7365036010742188, Validation
Acc:0.7752247752247752
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [256/562], Loss: 0.629150390625, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [320/562], Loss: 0.4068983495235443, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [384/562], Loss: 0.17548468708992004, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [61/100], Step: [448/562], Loss: 0.49803948402404785, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
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Epoch: [61/100], Step: [512/562], Loss: 0.785982608795166, Validation
Acc:0.7742257742257742
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
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        [-0.5321,  1.5291, -0.0481,  …,  0.8276, -1.0539, -1.2314],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [64/562], Loss: 1.5262004137039185, Validation
Acc:0.7762237762237763
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [128/562], Loss: 0.6358172297477722, Validation
Acc:0.7762237762237763
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [192/562], Loss: 0.49892130494117737, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

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        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [256/562], Loss: 0.6516662240028381, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [320/562], Loss: 0.6894094347953796, Validation
Acc:0.7772227772227772
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [384/562], Loss: 0.4074605703353882, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [448/562], Loss: 0.2612490952014923, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [62/100], Step: [512/562], Loss: 0.3852831721305847, Validation
Acc:0.7742257742257742
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5301,  1.5317, -0.0517,  …,  0.8421, -1.0568, -1.2314],
        …,
```

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         [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
         [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
         [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [64/562], Loss: 0.7063731551170349, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [128/562], Loss: 0.19428971409797668, Validation
Acc:0.7732267732267732
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [192/562], Loss: 0.08623959869146347, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [256/562], Loss: 0.4714099168777466, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [320/562], Loss: 0.4497600197792053, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [384/562], Loss: 0.6736221313476562, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [448/562], Loss: 0.9975959062576294, Validation
Acc:0.7742257742257742
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [63/100], Step: [512/562], Loss: 0.8620049953460693, Validation
Acc:0.7742257742257742
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5305,  1.5375, -0.0555,  …,  0.8340, -1.0605, -1.2318],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [64/562], Loss: 1.019935965538025, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [128/562], Loss: 0.34856116771698, Validation
Acc:0.7792207792207793
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [192/562], Loss: 0.4818662405014038, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [256/562], Loss: 0.7928770780563354, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [320/562], Loss: 0.40930449962615967, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
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```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [384/562], Loss: 0.6787058115005493, Validation
Acc:0.7772227772227772
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [448/562], Loss: 0.4072999358177185, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [64/100], Step: [512/562], Loss: 0.597213864326477, Validation
Acc:0.7782217782217782
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5345,  1.5412, -0.0597,  …,  0.8379, -1.0629, -1.2310],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [64/562], Loss: 0.5835244059562683, Validation
Acc:0.7782217782217782
```

```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [128/562], Loss: 0.6614144444465637, Validation
Acc:0.7772227772227772
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [192/562], Loss: 0.3090479075908661, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [256/562], Loss: 0.8691374063491821, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [320/562], Loss: 0.6393618583679199, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

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Epoch: [65/100], Step: [384/562], Loss: 0.6233773231506348, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [448/562], Loss: 0.3343558609485626, Validation
Acc:0.7752247752247752
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [65/100], Step: [512/562], Loss: 1.3131425380706787, Validation
Acc:0.7772227772227772
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5368,  1.5447, -0.0634,  …,  0.8391, -1.0670, -1.2305],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [64/562], Loss: 0.5780597925186157, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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```

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          72, 73, 74, 75, 76])
Epoch: [66/100], Step: [128/562], Loss: 0.9098154306411743, Validation
Acc:0.7792207792207793
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [192/562], Loss: 0.7224974036216736, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [256/562], Loss: 0.824790358543396, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [320/562], Loss: 0.2619403302669525, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [384/562], Loss: 0.15115076303482056, Validation
Acc:0.7772227772227772
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [448/562], Loss: 0.14693883061408997, Validation
Acc:0.7772227772227772
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [66/100], Step: [512/562], Loss: 1.0165406465530396, Validation
Acc:0.7772227772227772
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5384,  1.5481, -0.0665,  …,  0.8417, -1.0719, -1.2308],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [64/562], Loss: 0.4673991799354553, Validation
Acc:0.7792207792207793
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [128/562], Loss: 0.3150610327720642, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [192/562], Loss: 0.3404141664505005, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [256/562], Loss: 0.38800495862960815, Validation
Acc:0.7792207792207793
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [320/562], Loss: 0.4444797933101654, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [384/562], Loss: 0.2259199619293213, Validation
Acc:0.7812187812187812
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [448/562], Loss: 0.7724116444587708, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [67/100], Step: [512/562], Loss: 0.561889111995697, Validation
Acc:0.7802197802197802
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5398,  1.5513, -0.0707,  …,  0.8380, -1.0739, -1.2281],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [64/562], Loss: 0.6139367818832397, Validation
Acc:0.7802197802197802
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [128/562], Loss: 0.3865281343460083, Validation
Acc:0.7782217782217782
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [192/562], Loss: 0.30677977204322815, Validation
Acc:0.7792207792207793
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [256/562], Loss: 0.3397198021411896, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [320/562], Loss: 0.3498260974884033, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [384/562], Loss: 0.5019817352294922, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [448/562], Loss: 0.40787601470947266, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [68/100], Step: [512/562], Loss: 0.48309916257858276, Validation
```

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Acc:0.7812187812187812
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5347,  1.5533, -0.0750,  …,  0.8381, -1.0760, -1.2258],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [64/562], Loss: 0.2540886700153351, Validation
Acc:0.7812187812187812
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [128/562], Loss: 0.402376651763916, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [192/562], Loss: 0.38437676429748535, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [69/100], Step: [256/562], Loss: 0.8101493120193481, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [320/562], Loss: 1.0442755222320557, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [384/562], Loss: 0.6618082523345947, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [448/562], Loss: 0.4424983859062195, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [69/100], Step: [512/562], Loss: 0.5479813814163208, Validation
Acc:0.7822177822177823
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5390,  1.5583, -0.0789,  …,  0.8442, -1.0784, -1.2254],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
```

```
              [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
              [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
           device='cuda:0', requires_grad=True)]
```
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [70/100], Step: [64/562], Loss: 0.4956422448158264, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [70/100], Step: [128/562], Loss: 0.45955032110214233, Validation
Acc:0.7822177822177823
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [70/100], Step: [192/562], Loss: 0.8573855757713318, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [70/100], Step: [256/562], Loss: 0.5062452554702759, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,

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              36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
              54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
              72, 73, 74, 75, 76])
Epoch: [70/100], Step: [320/562], Loss: 0.6986110806465149, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
              18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
              36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
              54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
              72, 73, 74, 75, 76])
Epoch: [70/100], Step: [384/562], Loss: 0.2740139067173004, Validation
Acc:0.7812187812187812
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
              18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
              36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
              54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
              72, 73, 74, 75, 76])
Epoch: [70/100], Step: [448/562], Loss: 0.32050713896751404, Validation
Acc:0.7832167832167832
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
              18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
              36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
              54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
              72, 73, 74, 75, 76])
Epoch: [70/100], Step: [512/562], Loss: 0.19307535886764526, Validation
Acc:0.7822177822177823
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5369,  1.5601, -0.0827,  …,  0.8397, -1.0822, -1.2264],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
```

```
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [64/562], Loss: 0.8808071613311768, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [128/562], Loss: 1.0493817329406738, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [192/562], Loss: 0.42840224504470825, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [256/562], Loss: 0.6788073778152466, Validation
Acc:0.7882117882117882
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [320/562], Loss: 0.4875631034374237, Validation
Acc:0.7882117882117882
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

```
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [384/562], Loss: 0.24870313704013824, Validation
Acc:0.7892107892107892
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [448/562], Loss: 0.9874433279037476, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [71/100], Step: [512/562], Loss: 0.15706154704093933, Validation
Acc:0.7842157842157842
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5405,  1.5606, -0.0866,  …,  0.8510, -1.0846, -1.2257],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [64/562], Loss: 0.8180588483810425, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [128/562], Loss: 0.5958124995231628, Validation
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [192/562], Loss: 0.16752877831459045, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [256/562], Loss: 0.19005075097084045, Validation
Acc:0.7872127872127872
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [320/562], Loss: 0.21135258674621582, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [384/562], Loss: 0.3747352957725525, Validation
```

```
Acc:0.7842157842157842
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [448/562], Loss: 0.7297052145004272, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [72/100], Step: [512/562], Loss: 0.5920732021331787, Validation
Acc:0.7872127872127872
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5430,  1.5625, -0.0904,  …,  0.8528, -1.0882, -1.2239],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [73/100], Step: [64/562], Loss: 0.8639624118804932, Validation
Acc:0.7852147852147852
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [73/100], Step: [128/562], Loss: 0.265501840353012085, Validation
Acc:0.7872127872127872
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [73/100], Step: [192/562], Loss: 0.34465834498405457, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [73/100], Step: [256/562], Loss: 0.43197929859161377, Validation
Acc:0.7872127872127872
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [73/100], Step: [320/562], Loss: 0.5489984750747681, Validation
Acc:0.7872127872127872
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [73/100], Step: [384/562], Loss: 0.4924902319908142, Validation
Acc:0.7862137862137862
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
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                  54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                  72, 73, 74, 75, 76])
Epoch: [73/100], Step: [448/562], Loss: 0.4179529845714569, Validation
Acc:0.7882117882117882
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                  18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                  36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                  54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                  72, 73, 74, 75, 76])
Epoch: [73/100], Step: [512/562], Loss: 0.8808807134628296, Validation
Acc:0.7872127872127872
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5411,  1.5662, -0.0938,  …,  0.8568, -1.0913, -1.2210],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                  18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                  36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                  54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                  72, 73, 74, 75, 76])
Epoch: [74/100], Step: [64/562], Loss: 0.41579440236091614, Validation
Acc:0.7912087912087912
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                  18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                  36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                  54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                  72, 73, 74, 75, 76])
Epoch: [74/100], Step: [128/562], Loss: 0.0980512723326683, Validation
Acc:0.7892107892107892
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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                  18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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                54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                72, 73, 74, 75, 76])
Epoch: [74/100], Step: [192/562], Loss: 0.297839492559433, Validation
Acc:0.7892107892107892
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                72, 73, 74, 75, 76])
Epoch: [74/100], Step: [256/562], Loss: 0.16236776113510132, Validation
Acc:0.7892107892107892
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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                36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                72, 73, 74, 75, 76])
Epoch: [74/100], Step: [320/562], Loss: 0.32813894748687744, Validation
Acc:0.7912087912087912
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                72, 73, 74, 75, 76])
Epoch: [74/100], Step: [384/562], Loss: 1.183543086051941, Validation
Acc:0.7922077922077922
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
                18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
                36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
                54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
                72, 73, 74, 75, 76])
Epoch: [74/100], Step: [448/562], Loss: 0.1587124913930893, Validation
Acc:0.7902097902097902
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [74/100], Step: [512/562], Loss: 0.5796997547149658, Validation
Acc:0.7902097902097902
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5421,  1.5676, -0.0974,  …,  0.8653, -1.0946, -1.2203],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [64/562], Loss: 0.7230700254440308, Validation
Acc:0.7892107892107892
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [128/562], Loss: 0.3890749216079712, Validation
Acc:0.7932067932067932
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [192/562], Loss: 0.5899515748023987, Validation
Acc:0.7932067932067932
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [256/562], Loss: 0.4334566295146942, Validation
Acc:0.7922077922077922
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [320/562], Loss: 0.9028316140174866, Validation
Acc:0.7922077922077922
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [384/562], Loss: 0.2545674741268158, Validation
Acc:0.7942057942057942
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [448/562], Loss: 0.37452924251556396, Validation
Acc:0.7932067932067932
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [75/100], Step: [512/562], Loss: 0.5563933849334717, Validation
Acc:0.7942057942057942
```

```
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5404,  1.5687, -0.1008,  …,  0.8643, -1.0988, -1.2182],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [64/562], Loss: 0.80511873960495, Validation
Acc:0.7952047952047953
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [128/562], Loss: 0.4728681445121765, Validation
Acc:0.7942057942057942
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [192/562], Loss: 0.2722685635089874, Validation
Acc:0.7952047952047953
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [256/562], Loss: 0.5708881616592407, Validation
```

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Acc:0.7952047952047953
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [320/562], Loss: 0.4821937084197998, Validation
Acc:0.7952047952047953
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [384/562], Loss: 0.8081742525100708, Validation
Acc:0.7952047952047953
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [448/562], Loss: 0.8064953684806824, Validation
Acc:0.7962037962037962
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [76/100], Step: [512/562], Loss: 0.2890163064002991, Validation
Acc:0.7962037962037962
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5402,  1.5715, -0.1047,  …,  0.8684, -1.1022, -1.2149],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
```

```
             [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
         device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [77/100], Step: [64/562], Loss: 0.5119810104370117, Validation
Acc:0.7932067932067932
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [77/100], Step: [128/562], Loss: 0.5245842933654785, Validation
Acc:0.7942057942057942
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [77/100], Step: [192/562], Loss: 0.5517163276672363, Validation
Acc:0.7972027972027972
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [77/100], Step: [256/562], Loss: 0.48286932706832886, Validation
Acc:0.7932067932067932
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [77/100], Step: [320/562], Loss: 0.22788776457309723, Validation
Acc:0.7942057942057942
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [77/100], Step: [384/562], Loss: 0.734390139579773, Validation
Acc:0.7962037962037962
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [77/100], Step: [448/562], Loss: 0.4198684096336365, Validation
Acc:0.7982017982017982
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [77/100], Step: [512/562], Loss: 0.6884692907333374, Validation
Acc:0.7992007992007992
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5377,  1.5728, -0.1081,  …,  0.8771, -1.1048, -1.2134],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [64/562], Loss: 0.3435435891151428, Validation
Acc:0.7982017982017982
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [128/562], Loss: 0.34742146730422974, Validation
Acc:0.7972027972027972
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [192/562], Loss: 0.8845174312591553, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [256/562], Loss: 0.7355457544326782, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [320/562], Loss: 0.5153465867042542, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [384/562], Loss: 0.09100997447967529, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [448/562], Loss: 0.5418404936790466, Validation
Acc:0.7982017982017982
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [78/100], Step: [512/562], Loss: 0.5157611966133118, Validation
Acc:0.7992007992007992
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5390,  1.5745, -0.1120,  …,  0.8715, -1.1077, -1.2111],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [64/562], Loss: 0.3926944136619568, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [128/562], Loss: 0.46918779611587524, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [192/562], Loss: 0.5879793763160706, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [256/562], Loss: 0.3043176233768463, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [320/562], Loss: 0.9500485062599182, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [384/562], Loss: 0.44360941648483276, Validation
Acc:0.7992007992007992
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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [448/562], Loss: 0.5091487169265747, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [79/100], Step: [512/562], Loss: 0.5116180181503296, Validation
Acc:0.8011988011988012
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5354,  1.5784, -0.1154,  …,  0.8705, -1.1109, -1.2096],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [64/562], Loss: 0.3345080316066742, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [128/562], Loss: 0.8210580945014954, Validation
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Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [192/562], Loss: 0.6351518034934998, Validation
Acc:0.7992007992007992
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [256/562], Loss: 0.12009476125240326, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [320/562], Loss: 0.6406841278076172, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [384/562], Loss: 0.24893002212047577, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
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            72, 73, 74, 75, 76])
Epoch: [80/100], Step: [448/562], Loss: 0.3779817521572113, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [80/100], Step: [512/562], Loss: 0.591335654258728, Validation
Acc:0.8021978021978022
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5338,  1.5795, -0.1188,  …,  0.8764, -1.1137, -1.2082],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [64/562], Loss: 0.4129297733306885, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [128/562], Loss: 0.7550361156463623, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [192/562], Loss: 0.30452853441238403, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [256/562], Loss: 0.38527756929397583, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [320/562], Loss: 0.5863127708435059, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [384/562], Loss: 0.5270557403564453, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [448/562], Loss: 0.5467249751091003, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [81/100], Step: [512/562], Loss: 0.22431497275829315, Validation
Acc:0.8031968031968032
[Parameter containing:
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        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5346,  1.5828, -0.1222,  …,  0.8698, -1.1152, -1.2072],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [64/562], Loss: 0.5244151949882507, Validation
Acc:0.8021978021978022
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [128/562], Loss: 0.16283491253852844, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [192/562], Loss: 0.3889019787311554, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [256/562], Loss: 0.8481464982032776, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [320/562], Loss: 0.08378536999225616, Validation
Acc:0.8001998001998002
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [384/562], Loss: 0.3649807572364807, Validation
Acc:0.8021978021978022
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [448/562], Loss: 0.09656129777431488, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [82/100], Step: [512/562], Loss: 0.253500372171402, Validation
Acc:0.8041958041958042
[Parameter containing:
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        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5364,  1.5855, -0.1259,  …,  0.8755, -1.1186, -1.2063],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [64/562], Loss: 0.3814803659915924, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [128/562], Loss: 0.13050049543380737, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [192/562], Loss: 0.26421356201171875, Validation
Acc:0.8011988011988012
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [256/562], Loss: 0.5426374077796936, Validation
Acc:0.8021978021978022
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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [320/562], Loss: 0.5349968075752258, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [384/562], Loss: 0.34194278717041016, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [448/562], Loss: 0.525388240814209, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [83/100], Step: [512/562], Loss: 0.9658605456352234, Validation
Acc:0.8041958041958042
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
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        [-0.5384,  1.5879, -0.1289,  …,  0.8805, -1.1215, -1.2062],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [64/562], Loss: 0.7139718532562256, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [128/562], Loss: 0.25147491693496704, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [192/562], Loss: 0.23327507078647614, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [256/562], Loss: 0.19527532160282135, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [320/562], Loss: 0.7397477030754089, Validation
Acc:0.8021978021978022
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [384/562], Loss: 0.19093701243400574, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [448/562], Loss: 0.2530766725540161, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [84/100], Step: [512/562], Loss: 0.3792087733745575, Validation
Acc:0.8041958041958042
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5400,  1.5887, -0.1323,  …,  0.8777, -1.1239, -1.2067],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [64/562], Loss: 0.30847519636154175, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [128/562], Loss: 0.6439802646636963, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [192/562], Loss: 0.39960795640945435, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [256/562], Loss: 0.6622517704963684, Validation
Acc:0.8021978021978022
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [320/562], Loss: 0.619281530380249, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [384/562], Loss: 0.4185074269771576, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [448/562], Loss: 0.2435944378376007, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [85/100], Step: [512/562], Loss: 0.0801084041595459, Validation
Acc:0.8041958041958042
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5409,  1.5919, -0.1355,  …,  0.8769, -1.1258, -1.2056],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [64/562], Loss: 0.2718309760093689, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [128/562], Loss: 0.6004636287689209, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [192/562], Loss: 0.5729051828384399, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [256/562], Loss: 0.3690280020236969, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [320/562], Loss: 0.5057011842727661, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [384/562], Loss: 0.973255455493927, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
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labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [448/562], Loss: 0.19981218874454498, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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        72, 73, 74, 75, 76])
Epoch: [86/100], Step: [512/562], Loss: 0.35869595408439636, Validation
Acc:0.8041958041958042
[Parameter containing:
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        [-0.5398,  1.5933, -0.1383,  …,  0.8801, -1.1279, -1.2050],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [64/562], Loss: 0.21287377178668976, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [128/562], Loss: 0.9021952152252197, Validation
Acc:0.8041958041958042
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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [192/562], Loss: 0.4624493718147278, Validation
Acc:0.8021978021978022
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [256/562], Loss: 0.6164951920509338, Validation
Acc:0.8031968031968032
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [320/562], Loss: 0.16520074009895325, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [384/562], Loss: 0.5087747573852539, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [87/100], Step: [448/562], Loss: 0.991589367389679, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [87/100], Step: [512/562], Loss: 0.17335233092308044, Validation
Acc:0.8051948051948052
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5396,  1.5955, -0.1416,  …,  0.8827, -1.1303, -1.2034],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [64/562], Loss: 0.2537202835083008, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [128/562], Loss: 0.6009835600852966, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

```
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [192/562], Loss: 0.3465523421764374, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [256/562], Loss: 0.23584826290607452, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [320/562], Loss: 0.18012601137161255, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [384/562], Loss: 0.91703200340271, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [88/100], Step: [448/562], Loss: 0.5424235463142395, Validation
Acc:0.8071928071928072
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [88/100], Step: [512/562], Loss: 0.2433912307024002, Validation
Acc:0.8071928071928072
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
         [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
         [-0.5376,  1.5958, -0.1444,  …,  0.8887, -1.1323, -1.2027],
         …,
         [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
         [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
         [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [89/100], Step: [64/562], Loss: 0.10523627698421478, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [89/100], Step: [128/562], Loss: 0.29870134592056274, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
         18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
         36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
         54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
         72, 73, 74, 75, 76])
Epoch: [89/100], Step: [192/562], Loss: 0.24543479084968567, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
```

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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [89/100], Step: [256/562], Loss: 0.492646723985672, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [89/100], Step: [320/562], Loss: 0.6063236594200134, Validation
Acc:0.8041958041958042
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [89/100], Step: [384/562], Loss: 0.28405052423477173, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [89/100], Step: [448/562], Loss: 0.818490207195282, Validation
Acc:0.8071928071928072
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [89/100], Step: [512/562], Loss: 0.2695738673210144, Validation
Acc:0.8071928071928072
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
```

```
            [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
            [-0.5353,  1.5965, -0.1474,  …,  0.8812, -1.1352, -1.2016],
             …,
            [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
            [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
            [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
          device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [64/562], Loss: 0.39570072293281555, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [128/562], Loss: 0.12137220799922943, Validation
Acc:0.8061938061938062
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [192/562], Loss: 0.6725817918777466, Validation
Acc:0.8071928071928072
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [256/562], Loss: 0.5275127291679382, Validation
Acc:0.8071928071928072
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [320/562], Loss: 0.47835618257522583, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [384/562], Loss: 0.3459169268608093, Validation
Acc:0.8051948051948052
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [448/562], Loss: 0.7966108322143555, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [90/100], Step: [512/562], Loss: 0.6961559057235718, Validation
Acc:0.8061938061938062
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5344,  1.5983, -0.1506,  …,  0.8764, -1.1369, -1.2002],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
```

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logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [64/562], Loss: 1.0419363975524902, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [128/562], Loss: 0.5732307434082031, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [192/562], Loss: 0.4468754529953003, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [256/562], Loss: 0.5838651657104492, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

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Epoch: [91/100], Step: [320/562], Loss: 0.30987250804901123, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [384/562], Loss: 0.21802759170532227, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [448/562], Loss: 0.42618563771247864, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [91/100], Step: [512/562], Loss: 0.2219078093767166, Validation
Acc:0.8091908091908092
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5350,  1.6000, -0.1537,  …,  0.8901, -1.1393, -1.1976],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
```

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       72, 73, 74, 75, 76])
Epoch: [92/100], Step: [64/562], Loss: 0.05910073220729828, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [92/100], Step: [128/562], Loss: 0.2634398341178894, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [92/100], Step: [192/562], Loss: 0.17186087369918823, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [92/100], Step: [256/562], Loss: 0.8421146869659424, Validation
Acc:0.8081918081918081
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [92/100], Step: [320/562], Loss: 0.41168028116226196, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            72, 73, 74, 75, 76])
Epoch: [92/100], Step: [384/562], Loss: 0.2072896957397461, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [92/100], Step: [448/562], Loss: 0.5078755021095276, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
            18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [92/100], Step: [512/562], Loss: 0.6202412843704224, Validation
Acc:0.8091908091908092
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5355,  1.6009, -0.1564,  …,  0.8965, -1.1429, -1.1974],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [93/100], Step: [64/562], Loss: 0.7035607695579529, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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          72, 73, 74, 75, 76])
Epoch: [93/100], Step: [128/562], Loss: 0.19804677367210388, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [93/100], Step: [192/562], Loss: 0.35052812099456787, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [93/100], Step: [256/562], Loss: 0.5795836448669434, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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          36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [93/100], Step: [320/562], Loss: 0.4627375602722168, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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          54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
          72, 73, 74, 75, 76])
Epoch: [93/100], Step: [384/562], Loss: 0.5578505992889404, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [93/100], Step: [448/562], Loss: 0.3610462546348572, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [93/100], Step: [512/562], Loss: 0.4691079258918762, Validation
Acc:0.8101898101898102
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5327,  1.6032, -0.1601,  …,  0.8965, -1.1440, -1.1965],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [64/562], Loss: 0.1263221651315689, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [128/562], Loss: 0.3364061713218689, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
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labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [192/562], Loss: 0.4336410462856293, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [256/562], Loss: 0.11001500487327576, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [320/562], Loss: 0.19444994628429413, Validation
Acc:0.8091908091908092
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [384/562], Loss: 0.4484764337539673, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [448/562], Loss: 0.5137994885444641, Validation
```

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Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [94/100], Step: [512/562], Loss: 0.41534093022346497, Validation
Acc:0.8111888111888111
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5348,  1.6053, -0.1632,  …,  0.8948, -1.1458, -1.1960],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [64/562], Loss: 0.2865206301212311, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [128/562], Loss: 0.42764872312545776, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

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Epoch: [95/100], Step: [192/562], Loss: 0.3305908441543579, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [256/562], Loss: 0.175016850233078, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [320/562], Loss: 0.11854161322116852, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [384/562], Loss: 0.31095975637435913, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [448/562], Loss: 0.3187490701675415, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [95/100], Step: [512/562], Loss: 0.34632420539855957, Validation
Acc:0.8111888111888111
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5350,  1.6072, -0.1663,  …,  0.8987, -1.1482, -1.1966],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [64/562], Loss: 0.18368013203144073, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [128/562], Loss: 0.4088864326477051, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [192/562], Loss: 0.4686632454395294, Validation
Acc:0.8101898101898102
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [256/562], Loss: 0.663076639175415, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [320/562], Loss: 0.4814909100532532, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [384/562], Loss: 0.11685783416032791, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [448/562], Loss: 0.5026751756668091, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [96/100], Step: [512/562], Loss: 0.5552465915679932, Validation
Acc:0.8121878121878122
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
```

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        [-0.5368,  1.6088, -0.1695,  …,  0.8992, -1.1508, -1.1946],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [64/562], Loss: 0.44682952761650085, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [128/562], Loss: 0.5226625204086304, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [192/562], Loss: 0.20587347447872162, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [256/562], Loss: 0.1932605803012848, Validation
Acc:0.8111888111888111
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
```

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labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [320/562], Loss: 0.15940697491168976, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [384/562], Loss: 0.2114351987838745, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [448/562], Loss: 0.40007027983665466, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [97/100], Step: [512/562], Loss: 0.21993526816368103, Validation
Acc:0.8141858141858141
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5386,  1.6102, -0.1725,  …,  0.9030, -1.1534, -1.1928],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
```

```
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [64/562], Loss: 0.7054288387298584, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [128/562], Loss: 0.26773935556411743, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [192/562], Loss: 0.218455508351326, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [256/562], Loss: 0.42038440704345703, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [320/562], Loss: 0.4729766845703125, Validation
```

```
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [384/562], Loss: 0.6156102418899536, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [448/562], Loss: 0.21797430515289307, Validation
Acc:0.8151848151848152
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [98/100], Step: [512/562], Loss: 0.25973576307296753, Validation
Acc:0.8161838161838162
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5363,  1.6125, -0.1753,  …,  0.8971, -1.1564, -1.1929],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
```

```
Epoch: [99/100], Step: [64/562], Loss: 0.39588814973831177, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [99/100], Step: [128/562], Loss: 0.06371304392814636, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [99/100], Step: [192/562], Loss: 0.25137773156166077, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [99/100], Step: [256/562], Loss: 0.6469699740409851, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [99/100], Step: [320/562], Loss: 0.8226374387741089, Validation
Acc:0.8121878121878122
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
```

```
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [99/100], Step: [384/562], Loss: 0.2631762623786926, Validation
Acc:0.8131868131868132
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [99/100], Step: [448/562], Loss: 0.3620991110801697, Validation
Acc:0.8151848151848152
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [99/100], Step: [512/562], Loss: 0.17865335941314697, Validation
Acc:0.8141858141858141
[Parameter containing:
tensor([[ 0.0000,  0.0000,  0.0000,  …,  0.0000,  0.0000,  0.0000],
        [ 0.2880, -0.5765,  0.1340,  …, -0.0300,  0.3268, -0.7425],
        [-0.5343,  1.6136, -0.1785,  …,  0.9029, -1.1575, -1.1909],
        …,
        [ 1.4538, -1.1602, -0.1184,  …,  1.0373,  2.3059, -0.4485],
        [ 0.6495, -0.6303,  0.1053,  …,  0.2994,  0.5924, -0.4854],
        [ 0.2241,  1.7852, -0.0807,  …, -2.4700,  1.1103,  0.2524]],
       device='cuda:0', requires_grad=True)]
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
            18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [64/562], Loss: 0.2903757393360138, Validation
Acc:0.8161838161838162
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
            18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
```

```
            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [128/562], Loss: 0.4676364064216614, Validation
Acc:0.8171828171828172
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
            18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [192/562], Loss: 0.5451000332832336, Validation
Acc:0.8171828171828172
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [256/562], Loss: 0.2196047604084015, Validation
Acc:0.8161838161838162
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [320/562], Loss: 0.5019338130950928, Validation
Acc:0.8141858141858141
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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            36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
            54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
            72, 73, 74, 75, 76])
Epoch: [100/100], Step: [384/562], Loss: 0.12104188650846481, Validation
Acc:0.8151848151848152
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
```

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        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [100/100], Step: [448/562], Loss: 0.17179134488105774, Validation
Acc:0.8151848151848152
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
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        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
Epoch: [100/100], Step: [512/562], Loss: 0.3373897075653076, Validation
Acc:0.8161838161838162
```

```python
# print the timestamp (Please do not remove)
!date

# Test the Model
print(test_model(test_loader, model))
```

```
Wed Oct  1 09:55:20 PM UTC 2025
logits shape: torch.Size([3080, 77])
labels shape: torch.Size([3080])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
(np.float64(0.7977272727272727), 0.8069541274775972, 0.7977272727272727,
0.8023141730770165)
```

```python
# print the timestamp (Please do not remove)
!date

state_dict = model.state_dict()
print(state_dict.keys())
torch.save(state_dict, "pytorch_model.bin")
```

```
Wed Oct  1 09:55:28 PM UTC 2025
odict_keys(['embedding.weight'])
```

```python
# print the timestamp (Please do not remove)
!date
```

```
# read state dict (each parameter has a name that maps to a tensor)
state_dict = torch.load("pytorch_model.bin", map_location="cpu")

# load weights into model
model.load_state_dict(state_dict)
```

Wed Oct 1 09:55:35 PM UTC 2025

[ ]: <All keys matched successfully>

[ ]:
```
# print the timestamp (Please do not remove)
!date

# Test the loaded model from Google Drive
print(test_model(test_loader, model))
```

Wed Oct 1 10:14:05 PM UTC 2025
logits shape: torch.Size([3080, 77])
labels shape: torch.Size([3080])
labels unique: tensor([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
(np.float64(0.7977272727272727), 0.8069541274775972, 0.7977272727272727,
0.8023141730770165)
```

## 4.8   Part VII: Parameter Tuning

### 4.8.1   Try `ngram_n=2`

Try to optimize your model F1 performance based on the validation set. Then report your precision/recall/F1 on both validation and test sets. What do you discover?

### 4.8.2   Other hyper-parameter tuning

Pick one other hyper-parameter to tune on. Which one will you pick? Then report your precision/recall/F1 on both validation and test sets. What do you discover?

Your code & answer:

[ ]: 
```
print the timestamp (please do not remove)
!date
```

Wed Oct  1 10:31:56 PM UTC 2025

[ ]: 
```
ngram_n=2
```

```
train_data, train_ngram_indexer = process_text_dataset(trainset, ngram_n,␣
 ↪vocab_size)
validation_data, _ = process_text_dataset(valset, ngram_n,␣
 ↪ngram_indexer=train_ngram_indexer)
test_data, _ = process_text_dataset(testset, ngram_n,␣
 ↪ngram_indexer=train_ngram_indexer)
```

64000
19819
{('?',): 2, ('.',): 3, ('card',): 4, ("n't",): 5, (',',): 6, ('account',): 7,
('money',): 8, ('transfer',): 9, ('get',): 10, ('payment',): 11, ('need',): 12,
('card', '?'): 13, ('cash',): 14, ('top',): 15, ('exchange',): 16, ('charged',):
17, ('please',): 18, ("'s",): 19, ('atm',): 20, ('app',): 21, ('fee',): 22,
('use',): 23, ('pending',): 24, ('top-up',): 25, ('!',): 26, ('help',): 27,
('would',): 28, ('made',): 29, ('long',): 30, ('transaction',): 31, ('still',):
32, ('new',): 33, ('pin',): 34, ('rate',): 35, ('account', '?'): 36, ('take',):
37, ('make',): 38, ('wrong',): 39, ('know',): 40, ('charge',): 41, ('cards',):
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('refund',): 46, ('want',): 47, ("'m",): 48, ('account', '.'): 49, ('see',): 50,
('got',): 51, ('tell',): 52, ('go',): 53, ('yet',): 54, ('extra',): 55,
('like',): 56, ('tried',): 57, ('one',): 58, ('using',): 59, ('card', '.'): 60,
('virtual',): 61, ('new', 'card'): 62, ('work',): 63, ('something',): 64,
('identity',): 65, ('disposable',): 66, ('showing',): 67, ('ca',): 68, ('ca',
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('much',): 99, ('debit',): 100, ('money', '?'): 101, ('cancel',): 102,
('transfers',): 103, ('purchase',): 104, ('sent',): 105, ('receive',): 106,
(',', '?'): 107, ('card', ','): 108, ('withdraw',): 109, ('used',): 110,
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118, ('.', '?'): 119, ('please', 'help'): 120, ('transfer', 'money'): 121,
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('verification',): 126, ('bought',): 127, ('show',): 128, ('mastercard',): 129,
('reason',): 130, ('phone',): 131, ('direct',): 132, ('cheque',): 133,
('right',): 134, ('another',): 135, ('lost',): 136, ('app', '?'): 137,
('details',): 138, ('way',): 139, ('sure',): 140, ('activate',): 141, ('direct',
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('merchant', 'refuse'): 19819, ('refuse', 'payment'): 19820}
19819
```

```python
# consturct datasets
py_train = TextClassifierDataset(train_data)
py_validation = TextClassifierDataset(validation_data)
py_test = TextClassifierDataset(test_data)

batch_grid = [50, 100, 200]   # 100
best_bs = None
best_val_f1 = -1.0
best_model_state = None

for bs in batch_grid:
    print("="*40)
    print(f"Training with batch_size={bs}")
    print("="*40)

    # construct data loader
    train_loader = torch.utils.data.DataLoader(dataset=py_train,
                                               batch_size=bs,
                                               
 ↪collate_fn=text_classifier_collate_func,
                                               shuffle=True)
    validation_loader = torch.utils.data.DataLoader(dataset=py_validation,
                                               batch_size=bs,
                                               
 ↪collate_fn=text_classifier_collate_func,
                                               shuffle=False)

    # instantiate a new LR model
    model = LogisticRegression(vocab_size, num_class).to(device)

    # Loss and Optimizer
    criterion = torch.nn.CrossEntropyLoss()
    optimizer = torch.optim.SGD(model.parameters(), lr=learning_rate)

    # Training
    model.train()
    for epoch in range(num_epochs):
        for i, (data, lengths, labels) in enumerate(train_loader):
```

```
            data_batch, length_batch, label_batch = Variable(data),␣
␣Variable(lengths), Variable(labels)
            outputs = model(data_batch, length_batch)
            loss = criterion(outputs, label_batch)
            optimizer.zero_grad()
            loss.backward()
            optimizer.step()

    # evaluate on validation set
    val_acc, val_precision, val_recall, val_f1 = test_model(validation_loader,␣
␣model)
    print(f"[Batch={bs}] Validation -> Acc={val_acc:.4f}, "
          f"P={val_precision:.4f}, R={val_recall:.4f}, F1={val_f1:.4f}")

    # keep best model based on validation F1
    if val_f1 > best_val_f1:
        best_val_f1 = val_f1
        best_bs = bs
        best_model_state = model.state_dict()

print("\n=== Best Batch Size ===")
print(f"Best batch_size={best_bs}, Validation F1={best_val_f1:.4f}")
```

```
========================================
Training with batch_size=50
========================================
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[Batch=50] Validation -> Acc=0.6054, P=0.6539, R=0.6050, F1=0.6285
========================================
Training with batch_size=100
========================================
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[Batch=100] Validation -> Acc=0.4645, P=0.5060, R=0.4418, F1=0.4717
```

```
========================================
Training with batch_size=200
========================================

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[Batch=200] Validation -> Acc=0.3167, P=0.3307, R=0.3023, F1=0.3158

=== Best Batch Size ===
Best batch_size=50, Validation F1=0.6285

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
```

```python
# print the timestamp (Please do not remove)
!date

state_dict = best_model_state
print(state_dict.keys())
torch.save(state_dict, "pytorch_n2_model.bin")
# read state dict (each parameter has a name that maps to a tensor)
state_dict = torch.load("pytorch_n2_model.bin", map_location="cpu")
# load weights into model
model.load_state_dict(state_dict)
# Test the loaded model from Google Drive
print(test_model(test_loader, model))
```

```
Wed Oct  1 11:29:37 PM UTC 2025
odict_keys(['embedding.weight'])
logits shape: torch.Size([3080, 77])
labels shape: torch.Size([3080])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
```

```
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
(np.float64(0.6198051948051948), 0.668031330306386, 0.6198051948051948,
0.6430152907499636)
```

After setting ngram=2 and trying different batch sizes to optimize performance on the valid set, I found batch_size=50 works better (Valid: Acc=0.6054, P=0.6539, R=0.6050, F1=0.6285; Test: Acc=0.6198, P=0.6680, R=0.6198, F1=0.6430) than 100/200. However, the accuracy, precision and F1 score in both valid and test sets are all worse than ngram=1, maybe because the dataset is not large enough to provide sufficient coverage of bigrams, leading to data sparsity. This makes the model overfit or fail to generalize well, while unigram features are more robust and reliable in this setting. For the next hyperparameter, I decide to tune the learning rate.

```python
# Learning rate tuning experiment
lr_grid = [0.05, 0.1, 0.2]    # 0.1
best_lr = None
best_val_f1 = -1.0
best_model_state = None


for lr in lr_grid:
    print("="*40)
    print(f"Training with learning_rate={lr}")
    print("="*40)

    # construct data loader (  batch_size=100   )
    train_loader = torch.utils.data.DataLoader(dataset=py_train,
                                                batch_size=50,
                                                                  ⌴
  ↪collate_fn=text_classifier_collate_func,
                                                shuffle=True)
    validation_loader = torch.utils.data.DataLoader(dataset=py_validation,
                                                batch_size=50,
                                                                  ⌴
  ↪collate_fn=text_classifier_collate_func,
                                                shuffle=False)

    # instantiate a new LR model
    model = LogisticRegression(vocab_size, num_class).to(device)

    # Loss and Optimizer
    criterion = torch.nn.CrossEntropyLoss()
    optimizer = torch.optim.SGD(model.parameters(), lr=lr)

    # Training
    model.train()
    for epoch in range(num_epochs):
        for i, (data, lengths, labels) in enumerate(train_loader):
```

```
            data_batch, length_batch, label_batch = Variable(data),␣
  ↪Variable(lengths), Variable(labels)
            outputs = model(data_batch, length_batch)
            loss = criterion(outputs, label_batch)
            optimizer.zero_grad()
            loss.backward()
            optimizer.step()

    # evaluate on validation set
    val_acc, val_precision, val_recall, val_f1 = test_model(validation_loader,␣
  ↪model)
    print(f"[LR={lr}] Validation -> Acc={val_acc:.4f}, "
          f"P={val_precision:.4f}, R={val_recall:.4f}, F1={val_f1:.4f}")

    # keep best model based on validation F1
    if val_f1 > best_val_f1:
        best_val_f1 = val_f1
        best_lr = lr
        best_model_state = model.state_dict()

print("\n=== Best Learning Rate ===")
print(f"Best lr={best_lr}, Validation F1={best_val_f1:.4f}")
```

```
========================================
Training with learning_rate=0.05
========================================
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[LR=0.05] Validation -> Acc=0.5135, P=0.5902, R=0.5094, F1=0.5468
========================================
Training with learning_rate=0.1
========================================

/usr/local/lib/python3.12/dist-packages/sklearn/metrics/_classification.py:1565:
UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels
with no predicted samples. Use `zero_division` parameter to control this
behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
```

```
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[LR=0.1] Validation -> Acc=0.5924, P=0.7152, R=0.5958, F1=0.6501
=======================================
Training with learning_rate=0.2
=======================================
logits shape: torch.Size([1001, 77])
labels shape: torch.Size([1001])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
[LR=0.2] Validation -> Acc=0.6913, P=0.7401, R=0.6926, F1=0.7156

=== Best Learning Rate ===
Best lr=0.2, Validation F1=0.7156
```

For the second experiment, I chose to tune the learning rate (0.05, 0.1, 0.2). I found that lr=0.2 gave the best validation performance with Acc=0.6913, P=0.7401, R=0.6926, F1=0.7156. When applied to the test set, the model achieved Acc=0.6844, P=0.7440, R=0.6844, F1=0.7130, which was consistent with the validation trend. This shows that a slightly higher learning rate helped the model converge better and improved F1, though the overall performance was still constrained by the n-gram feature representation.

```python
# print the timestamp (Please do not remove)
!date

state_dict = best_model_state
print(state_dict.keys())
torch.save(state_dict, "pytorch_n2_model_with_lr.bin")
# read state dict (each parameter has a name that maps to a tensor)
state_dict = torch.load("pytorch_n2_model_with_lr.bin", map_location="cpu")
# load weights into model
model.load_state_dict(state_dict)
# Test the loaded model from Google Drive
print(test_model(test_loader, model))
```

```
Wed Oct  1 11:39:14 PM UTC 2025
odict_keys(['embedding.weight'])
logits shape: torch.Size([3080, 77])
labels shape: torch.Size([3080])
labels unique: tensor([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13,
14, 15, 16, 17,
        18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
```

```
        36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
        54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
        72, 73, 74, 75, 76])
(np.float64(0.6844155844155844), 0.7439715094787672, 0.6844155844155844,
0.7129519688675037)
```