BasicCNN_Pytorch

November 22, 2020

0.0.1 Clone Dataset & Supporting Files

[3]:
```
!git clone https://github.com/Aggarwal-Abhishek/BasicCNN_Pytorch
```

0.0.2 Importing Libraries

[4]:
```
import os
import numpy as np
import pandas as pd
from PIL import Image
from time import time
from matplotlib import pyplot as plt
from IPython.display import display
```

[5]:
```
import torch
import torch.nn as nn

import torchvision
import torchvision.transforms as transforms

from torchsummary import summary

device = torch.device('cuda' if torch.cuda.is_available() else 'cpu')
print('Using:', device)
```

```
Using: cuda
```

0.0.3 Define Datasets and Dataloaders

[7]:
```
dataset_path = 'BasicCNN_Pytorch/raw-img'

mean = torch.tensor([0.485, 0.456, 0.406], dtype=torch.float32)
std = torch.tensor([0.229, 0.224, 0.225], dtype=torch.float32)
```

```
# Transformation function to be applied on images
# 1. Horizontally Flip the image with a probability of 30%
# 2. Randomly Rotate the image at an angle between -40 to 40 degress.
# 3. Resize each images to a smallest size of 300 pixels maintaining aspect␣
 ↪ratio
# 4. Crop a square of size 256x256 from the center of image
# 5. Convert Image to a Pytorch Tensor
# 6. Normalize the pytorch's tensor using mean & std of imagenet
transform = transforms.Compose([
    transforms.RandomHorizontalFlip(p=0.3),
    transforms.RandomRotation(degrees=40),

    transforms.Resize(300),
    transforms.CenterCrop(256),

    transforms.ToTensor(),
    transforms.Normalize(mean=mean, std=std)
])

# Create a dataset by from the dataset folder by applying the above␣
 ↪transformation.
dataset = torchvision.datasets.ImageFolder(dataset_path, transform=transform)
# Split the dataset into train & test containing 21000 and 5179 images␣
 ↪respectively.
train_dataset, test_dataset = torch.utils.data.random_split(dataset, (21000,␣
 ↪5179))

# Create a Train DataLoader using Train Dataset
train_dataloader = torch.utils.data.DataLoader(
    dataset=train_dataset,
    batch_size=16,
    shuffle=False,
    num_workers=4
)
# Create a Test DataLoader using Test Dataset
test_dataloader = torch.utils.data.DataLoader(
    dataset=test_dataset,
    batch_size=16,
    shuffle=False,
    num_workers=4
)
```

0.0.4 Plot Some Samples of data

[8]:
```
figsize = (16,16)

def PlotSamples(dataloader, title='Images'):
    sample_data = next(iter(dataloader))[0].to(device)
    plt.figure(figsize=figsize)
    plt.axis('off')
    plt.title(title)
    plt.imshow(np.transpose(torchvision.utils.make_grid(
        sample_data, padding=2, normalize=True
    ).cpu(), (1,2,0)))


def PlotClass(dataloader, mclass, title='Images', num=64):
    ret = []

    for data in dataloader.dataset:
        if data[1] == mclass:
            ret.append(data[0])

            if len(ret) == num:
                break

    plt.figure(figsize=figsize)
    plt.axis('off')
    plt.title(title)
    plt.imshow(np.transpose(torchvision.utils.make_grid(
        ret, padding=2, normalize=True
    ).cpu(), (1,2,0)))
```

[9]:
```
PlotSamples(train_dataloader)
```

0.0.5 Defile Model Architecture

[10]:
```
class MyModel(nn.Module):
    def __init__(self):
        super(MyModel, self).__init__()

        self.model = nn.Sequential(
            nn.Conv2d(3, 16, kernel_size=3), nn.ReLU(),
            nn.Conv2d(16, 16, kernel_size=3), nn.ReLU(),
            nn.MaxPool2d(2,2),

            nn.Conv2d(16, 32, kernel_size=3), nn.ReLU(),
            nn.Conv2d(32, 32, kernel_size=3), nn.ReLU(),
            nn.MaxPool2d(2,2),

            nn.Conv2d(32, 64, kernel_size=3), nn.ReLU(),
            nn.Conv2d(64, 64, kernel_size=3), nn.ReLU(),
            nn.MaxPool2d(2,2),

            nn.Conv2d(64, 128, kernel_size=3), nn.ReLU(),
            nn.Conv2d(128, 128, kernel_size=3), nn.ReLU(),
            nn.MaxPool2d(2,2),

            nn.Conv2d(128, 256, kernel_size=3), nn.ReLU(),
            nn.Conv2d(256, 256, kernel_size=3), nn.ReLU(),
            nn.MaxPool2d(2,2),

        ).to(device)

        self.classifier = nn.Sequential(
            nn.Flatten(),
            nn.Dropout(0.25),
            nn.Linear(4096, 256),
            nn.ReLU(),

            nn.Dropout(0.5),
            nn.Linear(256, 10)
        ).to(device)

    def forward(self, x):
        x = self.model(x)
        x = self.classifier(x)
        return x


model = MyModel().to(device)
summary(model, (3,256,256))
```

```
----------------------------------------------------------------
        Layer (type)               Output Shape         Param #
================================================================
            Conv2d-1         [-1, 16, 254, 254]             448
              ReLU-2         [-1, 16, 254, 254]               0
            Conv2d-3         [-1, 16, 252, 252]           2,320
              ReLU-4         [-1, 16, 252, 252]               0
         MaxPool2d-5         [-1, 16, 126, 126]               0
            Conv2d-6         [-1, 32, 124, 124]           4,640
              ReLU-7         [-1, 32, 124, 124]               0
            Conv2d-8         [-1, 32, 122, 122]           9,248
              ReLU-9         [-1, 32, 122, 122]               0
        MaxPool2d-10           [-1, 32, 61, 61]               0
           Conv2d-11           [-1, 64, 59, 59]          18,496
             ReLU-12           [-1, 64, 59, 59]               0
           Conv2d-13           [-1, 64, 57, 57]          36,928
             ReLU-14           [-1, 64, 57, 57]               0
        MaxPool2d-15           [-1, 64, 28, 28]               0
           Conv2d-16          [-1, 128, 26, 26]          73,856
             ReLU-17          [-1, 128, 26, 26]               0
           Conv2d-18          [-1, 128, 24, 24]         147,584
             ReLU-19          [-1, 128, 24, 24]               0
        MaxPool2d-20          [-1, 128, 12, 12]               0
           Conv2d-21          [-1, 256, 10, 10]         295,168
             ReLU-22          [-1, 256, 10, 10]               0
           Conv2d-23            [-1, 256, 8, 8]         590,080
             ReLU-24            [-1, 256, 8, 8]               0
        MaxPool2d-25            [-1, 256, 4, 4]               0
          Flatten-26                 [-1, 4096]               0
          Dropout-27                 [-1, 4096]               0
           Linear-28                  [-1, 256]       1,048,832
             ReLU-29                  [-1, 256]               0
          Dropout-30                  [-1, 256]               0
           Linear-31                   [-1, 10]           2,570
================================================================
Total params: 2,230,170
Trainable params: 2,230,170
Non-trainable params: 0
----------------------------------------------------------------
Input size (MB): 0.75
Forward/backward pass size (MB): 59.16
Params size (MB): 8.51
Estimated Total Size (MB): 68.42
----------------------------------------------------------------
```

0.0.6 Training Procedure

[11]:
```
def Train(epoch, print_every=50):
    total_loss = 0
    start_time = time()

    accuracy = []

    for i, batch in enumerate(train_dataloader, 1):
        minput = batch[0].to(device) # Get batch of images from our train␣
↪dataloader
        target = batch[1].to(device) # Get the corresponding target(0, 1 or 2)␣
↪representing cats, dogs or pandas

        moutput = model(minput) # output by our model

        loss = criterion(moutput, target) # compute cross entropy loss
        total_loss += loss.item()

        optimizer.zero_grad() # Clear the gradients if exists. (Gradients are␣
↪used for back-propogation.)
        loss.backward() # Back propogate the losses
        optimizer.step() # Update Model parameters

        argmax = moutput.argmax(dim=1) # Get the class index with maximum␣
↪probability predicted by the model
        accuracy.append((target==argmax).sum().item() / target.shape[0]) #␣
↪calculate accuracy by comparing to target tensor

        if i%print_every == 0:
            print('Epoch: [{}]/({}/{}), Train Loss: {:.4f}, Accuracy: {:.2f},␣
↪Time: {:.2f} sec'.format(
                epoch, i, len(train_dataloader), loss.item(), sum(accuracy)/
↪len(accuracy), time()-start_time
            ))

    return total_loss / len(train_dataloader) # Returning Average Training Loss
```

0.0.7 Testing Procedure

[12]:
```
def Test(epoch):
    total_loss = 0
    start_time = time()

    accuracy = []
```

```
    with torch.no_grad(): # disable calculations of gradients for all pytorch␣
↪operations inside the block
        for i, batch in enumerate(test_dataloader):
            minput = batch[0].to(device) # Get batch of images from our test␣
↪dataloader
            target = batch[1].to(device) # Get the corresponding target(0, 1 or␣
↪2) representing cats, dogs or pandas
            moutput = model(minput) # output by our model

            loss = criterion(moutput, target) # compute cross entropy loss
            total_loss += loss.item()


            # To get the probabilities for different classes we need to apply a␣
↪softmax operation on moutput
            argmax = moutput.argmax(dim=1) # Find the index(0, 1 or 2) with␣
↪maximum score (which denotes class with maximum probability)
            accuracy.append((target==argmax).sum().item() / target.shape[0]) #␣
↪Find the accuracy of the batch by comparing it with actual targets

    print('Epoch: [{}], Test Loss: {:.4f}, Accuracy: {:.2f}, Time: {:.2f} sec'.
↪format(
        epoch, total_loss/len(test_dataloader), sum(accuracy)/len(accuracy),␣
↪time()-start_time
    ))
    return total_loss/len(test_dataloader) # Returning Average Testing Loss
```

0.0.8 Model, Optimizer & Loss Function

[13]:
```
lr = 0.0001
model = MyModel().to(device)

optimizer = torch.optim.Adam(model.parameters(), lr=lr)
criterion = nn.CrossEntropyLoss()
```

0.0.9 Train for 50 epochs

[ ]:
```
Test(0)

train_loss = []
test_loss = []

for epoch in range(1, 51):
```

```
    train_loss.append(Train(epoch,200))
    test_loss.append(Test(epoch))

    print('\n')

    if epoch % 10 == 0:
        torch.save(model, 'model_'+str(epoch)+'.pth')
```

```
Epoch: [0], Test Loss: 2.3030, Accuracy: 0.06, Time: 28.39 sec
Epoch: [1]/(200/1313), Train Loss: 2.2532, Accuracy: 0.18, Time: 19.67 sec
Epoch: [1]/(400/1313), Train Loss: 2.2036, Accuracy: 0.18, Time: 38.28 sec
Epoch: [1]/(600/1313), Train Loss: 2.3523, Accuracy: 0.18, Time: 58.42 sec
Epoch: [1]/(800/1313), Train Loss: 2.0119, Accuracy: 0.19, Time: 78.86 sec
Epoch: [1]/(1000/1313), Train Loss: 2.2227, Accuracy: 0.18, Time: 98.65 sec
Epoch: [1]/(1200/1313), Train Loss: 2.3455, Accuracy: 0.18, Time: 117.76 sec
Epoch: [1], Test Loss: 2.1725, Accuracy: 0.21, Time: 28.24 sec


Epoch: [2]/(200/1313), Train Loss: 2.1911, Accuracy: 0.26, Time: 19.71 sec
Epoch: [2]/(400/1313), Train Loss: 2.0942, Accuracy: 0.26, Time: 38.45 sec
Epoch: [2]/(600/1313), Train Loss: 2.2354, Accuracy: 0.27, Time: 58.54 sec
Epoch: [2]/(800/1313), Train Loss: 2.0713, Accuracy: 0.28, Time: 79.20 sec
Epoch: [2]/(1000/1313), Train Loss: 2.1115, Accuracy: 0.29, Time: 99.30 sec
Epoch: [2]/(1200/1313), Train Loss: 2.0374, Accuracy: 0.29, Time: 118.49 sec
Epoch: [2], Test Loss: 1.9357, Accuracy: 0.34, Time: 27.87 sec


Epoch: [3]/(200/1313), Train Loss: 2.0597, Accuracy: 0.35, Time: 19.44 sec
Epoch: [3]/(400/1313), Train Loss: 1.9305, Accuracy: 0.34, Time: 38.16 sec
Epoch: [3]/(600/1313), Train Loss: 1.8405, Accuracy: 0.35, Time: 58.14 sec
Epoch: [3]/(800/1313), Train Loss: 2.2401, Accuracy: 0.35, Time: 78.39 sec
Epoch: [3]/(1000/1313), Train Loss: 1.9809, Accuracy: 0.35, Time: 98.72 sec
Epoch: [3]/(1200/1313), Train Loss: 1.8763, Accuracy: 0.36, Time: 117.81 sec
Epoch: [3], Test Loss: 1.8078, Accuracy: 0.37, Time: 27.88 sec


Epoch: [4]/(200/1313), Train Loss: 2.0961, Accuracy: 0.38, Time: 19.41 sec
Epoch: [4]/(400/1313), Train Loss: 1.3570, Accuracy: 0.38, Time: 38.03 sec
Epoch: [4]/(600/1313), Train Loss: 2.1184, Accuracy: 0.38, Time: 58.04 sec
Epoch: [4]/(800/1313), Train Loss: 2.1418, Accuracy: 0.39, Time: 78.47 sec
Epoch: [4]/(1000/1313), Train Loss: 1.9758, Accuracy: 0.39, Time: 98.18 sec
Epoch: [4]/(1200/1313), Train Loss: 1.8684, Accuracy: 0.39, Time: 117.11 sec
Epoch: [4], Test Loss: 1.7323, Accuracy: 0.41, Time: 27.79 sec


Epoch: [5]/(200/1313), Train Loss: 1.9566, Accuracy: 0.42, Time: 19.37 sec
Epoch: [5]/(400/1313), Train Loss: 1.3377, Accuracy: 0.42, Time: 37.64 sec
```

```
Epoch: [5]/(600/1313), Train Loss: 1.9247, Accuracy: 0.43, Time: 57.23 sec
Epoch: [5]/(800/1313), Train Loss: 1.9240, Accuracy: 0.43, Time: 77.22 sec
Epoch: [5]/(1000/1313), Train Loss: 1.8556, Accuracy: 0.43, Time: 96.82 sec
Epoch: [5]/(1200/1313), Train Loss: 1.8534, Accuracy: 0.43, Time: 115.51 sec
Epoch: [5], Test Loss: 1.6553, Accuracy: 0.44, Time: 27.61 sec


Epoch: [6]/(200/1313), Train Loss: 1.9907, Accuracy: 0.45, Time: 19.37 sec
Epoch: [6]/(400/1313), Train Loss: 1.3526, Accuracy: 0.46, Time: 37.75 sec
Epoch: [6]/(600/1313), Train Loss: 2.0133, Accuracy: 0.46, Time: 57.67 sec
Epoch: [6]/(800/1313), Train Loss: 2.0231, Accuracy: 0.47, Time: 77.90 sec
Epoch: [6]/(1000/1313), Train Loss: 1.6447, Accuracy: 0.47, Time: 97.52 sec
Epoch: [6]/(1200/1313), Train Loss: 1.9076, Accuracy: 0.47, Time: 116.44 sec
Epoch: [6], Test Loss: 1.5545, Accuracy: 0.47, Time: 27.55 sec


Epoch: [7]/(200/1313), Train Loss: 1.3916, Accuracy: 0.49, Time: 19.54 sec
Epoch: [7]/(400/1313), Train Loss: 1.4834, Accuracy: 0.49, Time: 38.29 sec
Epoch: [7]/(600/1313), Train Loss: 1.7988, Accuracy: 0.49, Time: 58.43 sec
Epoch: [7]/(800/1313), Train Loss: 2.0041, Accuracy: 0.50, Time: 78.48 sec
Epoch: [7]/(1000/1313), Train Loss: 1.8805, Accuracy: 0.50, Time: 98.50 sec
Epoch: [7]/(1200/1313), Train Loss: 1.9586, Accuracy: 0.50, Time: 117.35 sec
Epoch: [7], Test Loss: 1.4995, Accuracy: 0.49, Time: 27.90 sec


Epoch: [8]/(200/1313), Train Loss: 1.5510, Accuracy: 0.51, Time: 19.31 sec
Epoch: [8]/(400/1313), Train Loss: 1.3479, Accuracy: 0.52, Time: 37.57 sec
Epoch: [8]/(600/1313), Train Loss: 1.8596, Accuracy: 0.52, Time: 57.18 sec
Epoch: [8]/(800/1313), Train Loss: 1.8075, Accuracy: 0.52, Time: 77.20 sec
Epoch: [8]/(1000/1313), Train Loss: 1.8926, Accuracy: 0.52, Time: 96.72 sec
Epoch: [8]/(1200/1313), Train Loss: 1.9354, Accuracy: 0.52, Time: 115.28 sec
Epoch: [8], Test Loss: 1.4444, Accuracy: 0.51, Time: 27.97 sec


Epoch: [9]/(200/1313), Train Loss: 1.5584, Accuracy: 0.54, Time: 19.79 sec
Epoch: [9]/(400/1313), Train Loss: 1.4806, Accuracy: 0.54, Time: 38.79 sec
Epoch: [9]/(600/1313), Train Loss: 1.7768, Accuracy: 0.54, Time: 58.96 sec
Epoch: [9]/(800/1313), Train Loss: 2.0351, Accuracy: 0.54, Time: 79.51 sec
Epoch: [9]/(1000/1313), Train Loss: 1.7145, Accuracy: 0.54, Time: 99.93 sec
Epoch: [9]/(1200/1313), Train Loss: 1.7103, Accuracy: 0.54, Time: 118.77 sec
Epoch: [9], Test Loss: 1.3931, Accuracy: 0.53, Time: 28.34 sec


Epoch: [10]/(200/1313), Train Loss: 1.3998, Accuracy: 0.56, Time: 19.70 sec
Epoch: [10]/(400/1313), Train Loss: 1.3900, Accuracy: 0.57, Time: 38.06 sec
Epoch: [10]/(600/1313), Train Loss: 1.5285, Accuracy: 0.57, Time: 58.74 sec
Epoch: [10]/(800/1313), Train Loss: 1.3881, Accuracy: 0.57, Time: 79.29 sec
Epoch: [10]/(1000/1313), Train Loss: 1.4728, Accuracy: 0.57, Time: 99.59 sec
```

```
Epoch: [10]/(1200/1313), Train Loss: 1.6308, Accuracy: 0.56, Time: 118.82 sec
Epoch: [10], Test Loss: 1.3127, Accuracy: 0.56, Time: 28.56 sec


Epoch: [11]/(200/1313), Train Loss: 1.3352, Accuracy: 0.57, Time: 19.86 sec
Epoch: [11]/(400/1313), Train Loss: 1.2779, Accuracy: 0.57, Time: 38.51 sec
Epoch: [11]/(600/1313), Train Loss: 1.3373, Accuracy: 0.57, Time: 58.75 sec
Epoch: [11]/(800/1313), Train Loss: 1.4651, Accuracy: 0.57, Time: 79.42 sec
Epoch: [11]/(1000/1313), Train Loss: 1.3575, Accuracy: 0.57, Time: 99.54 sec
Epoch: [11]/(1200/1313), Train Loss: 1.4739, Accuracy: 0.57, Time: 118.50 sec
Epoch: [11], Test Loss: 1.2617, Accuracy: 0.57, Time: 27.93 sec


Epoch: [12]/(200/1313), Train Loss: 1.2189, Accuracy: 0.59, Time: 19.78 sec
Epoch: [12]/(400/1313), Train Loss: 1.1014, Accuracy: 0.60, Time: 38.51 sec
Epoch: [12]/(600/1313), Train Loss: 1.2129, Accuracy: 0.59, Time: 58.40 sec
Epoch: [12]/(800/1313), Train Loss: 1.3587, Accuracy: 0.59, Time: 78.93 sec
Epoch: [12]/(1000/1313), Train Loss: 1.6247, Accuracy: 0.59, Time: 99.12 sec
Epoch: [12]/(1200/1313), Train Loss: 1.5091, Accuracy: 0.60, Time: 118.05 sec
Epoch: [12], Test Loss: 1.2432, Accuracy: 0.59, Time: 27.88 sec


Epoch: [13]/(200/1313), Train Loss: 1.2260, Accuracy: 0.61, Time: 19.86 sec
Epoch: [13]/(400/1313), Train Loss: 1.5287, Accuracy: 0.61, Time: 38.76 sec
Epoch: [13]/(600/1313), Train Loss: 1.1739, Accuracy: 0.61, Time: 59.13 sec
Epoch: [13]/(800/1313), Train Loss: 1.5752, Accuracy: 0.61, Time: 79.69 sec
Epoch: [13]/(1000/1313), Train Loss: 1.4326, Accuracy: 0.61, Time: 99.73 sec
Epoch: [13]/(1200/1313), Train Loss: 1.3747, Accuracy: 0.61, Time: 119.00 sec
Epoch: [13], Test Loss: 1.2413, Accuracy: 0.58, Time: 27.98 sec


Epoch: [14]/(200/1313), Train Loss: 1.1598, Accuracy: 0.61, Time: 19.74 sec
Epoch: [14]/(400/1313), Train Loss: 1.3387, Accuracy: 0.61, Time: 38.44 sec
Epoch: [14]/(600/1313), Train Loss: 1.0792, Accuracy: 0.61, Time: 58.47 sec
Epoch: [14]/(800/1313), Train Loss: 1.3772, Accuracy: 0.61, Time: 78.73 sec
Epoch: [14]/(1000/1313), Train Loss: 1.7583, Accuracy: 0.61, Time: 98.54 sec
Epoch: [14]/(1200/1313), Train Loss: 1.3713, Accuracy: 0.62, Time: 117.48 sec
Epoch: [14], Test Loss: 1.2033, Accuracy: 0.60, Time: 28.03 sec


Epoch: [15]/(200/1313), Train Loss: 1.1560, Accuracy: 0.62, Time: 19.72 sec
Epoch: [15]/(400/1313), Train Loss: 1.3060, Accuracy: 0.62, Time: 38.43 sec
Epoch: [15]/(600/1313), Train Loss: 1.2692, Accuracy: 0.63, Time: 58.82 sec
Epoch: [15]/(800/1313), Train Loss: 1.4220, Accuracy: 0.63, Time: 79.21 sec
Epoch: [15]/(1000/1313), Train Loss: 1.1762, Accuracy: 0.63, Time: 99.56 sec
Epoch: [15]/(1200/1313), Train Loss: 1.0425, Accuracy: 0.63, Time: 118.83 sec
Epoch: [15], Test Loss: 1.1614, Accuracy: 0.62, Time: 28.05 sec
```

```
Epoch: [16]/(200/1313), Train Loss: 1.3043, Accuracy: 0.64, Time: 19.94 sec
Epoch: [16]/(400/1313), Train Loss: 1.0762, Accuracy: 0.64, Time: 39.01 sec
Epoch: [16]/(600/1313), Train Loss: 1.1132, Accuracy: 0.64, Time: 59.62 sec
Epoch: [16]/(800/1313), Train Loss: 1.0942, Accuracy: 0.64, Time: 80.14 sec
Epoch: [16]/(1000/1313), Train Loss: 1.5203, Accuracy: 0.64, Time: 100.61 sec
Epoch: [16]/(1200/1313), Train Loss: 1.2617, Accuracy: 0.64, Time: 119.73 sec
Epoch: [16], Test Loss: 1.1799, Accuracy: 0.61, Time: 28.11 sec


Epoch: [17]/(200/1313), Train Loss: 1.1382, Accuracy: 0.65, Time: 19.98 sec
Epoch: [17]/(400/1313), Train Loss: 1.2168, Accuracy: 0.65, Time: 39.07 sec
Epoch: [17]/(600/1313), Train Loss: 1.0871, Accuracy: 0.65, Time: 59.55 sec
Epoch: [17]/(800/1313), Train Loss: 1.3286, Accuracy: 0.65, Time: 80.10 sec
Epoch: [17]/(1000/1313), Train Loss: 1.0324, Accuracy: 0.65, Time: 100.38 sec
Epoch: [17]/(1200/1313), Train Loss: 1.3009, Accuracy: 0.65, Time: 119.65 sec
Epoch: [17], Test Loss: 1.1654, Accuracy: 0.61, Time: 28.43 sec


Epoch: [18]/(200/1313), Train Loss: 1.1117, Accuracy: 0.66, Time: 19.82 sec
Epoch: [18]/(400/1313), Train Loss: 1.2251, Accuracy: 0.66, Time: 38.84 sec
Epoch: [18]/(600/1313), Train Loss: 0.7306, Accuracy: 0.66, Time: 59.43 sec
Epoch: [18]/(800/1313), Train Loss: 1.2469, Accuracy: 0.66, Time: 80.12 sec
Epoch: [18]/(1000/1313), Train Loss: 1.3955, Accuracy: 0.66, Time: 100.38 sec
Epoch: [18]/(1200/1313), Train Loss: 1.0940, Accuracy: 0.66, Time: 119.70 sec
Epoch: [18], Test Loss: 1.1285, Accuracy: 0.63, Time: 28.04 sec


Epoch: [19]/(200/1313), Train Loss: 1.1237, Accuracy: 0.66, Time: 19.86 sec
Epoch: [19]/(400/1313), Train Loss: 1.5843, Accuracy: 0.67, Time: 38.98 sec
Epoch: [19]/(600/1313), Train Loss: 1.0039, Accuracy: 0.67, Time: 59.37 sec
Epoch: [19]/(800/1313), Train Loss: 1.0460, Accuracy: 0.67, Time: 80.19 sec
Epoch: [19]/(1000/1313), Train Loss: 0.9658, Accuracy: 0.67, Time: 100.60 sec
Epoch: [19]/(1200/1313), Train Loss: 1.0893, Accuracy: 0.67, Time: 120.00 sec
Epoch: [19], Test Loss: 1.0870, Accuracy: 0.64, Time: 28.60 sec


Epoch: [20]/(200/1313), Train Loss: 1.0319, Accuracy: 0.69, Time: 19.89 sec
Epoch: [20]/(400/1313), Train Loss: 0.9441, Accuracy: 0.68, Time: 38.73 sec
Epoch: [20]/(600/1313), Train Loss: 0.8790, Accuracy: 0.69, Time: 59.35 sec
Epoch: [20]/(800/1313), Train Loss: 0.9891, Accuracy: 0.68, Time: 79.68 sec
Epoch: [20]/(1000/1313), Train Loss: 0.8737, Accuracy: 0.68, Time: 100.23 sec
Epoch: [20]/(1200/1313), Train Loss: 1.1935, Accuracy: 0.69, Time: 119.63 sec
Epoch: [20], Test Loss: 1.1116, Accuracy: 0.64, Time: 28.48 sec


Epoch: [21]/(200/1313), Train Loss: 1.1999, Accuracy: 0.69, Time: 19.78 sec
Epoch: [21]/(400/1313), Train Loss: 1.2059, Accuracy: 0.69, Time: 38.63 sec
```

```
Epoch: [21]/(600/1313), Train Loss: 1.0356, Accuracy: 0.69, Time: 59.01 sec
Epoch: [21]/(800/1313), Train Loss: 1.2005, Accuracy: 0.69, Time: 79.68 sec
Epoch: [21]/(1000/1313), Train Loss: 0.7520, Accuracy: 0.69, Time: 99.86 sec
Epoch: [21]/(1200/1313), Train Loss: 1.0951, Accuracy: 0.69, Time: 119.11 sec
Epoch: [21], Test Loss: 1.0794, Accuracy: 0.65, Time: 28.20 sec


Epoch: [22]/(200/1313), Train Loss: 0.9170, Accuracy: 0.69, Time: 19.79 sec
Epoch: [22]/(400/1313), Train Loss: 0.9944, Accuracy: 0.70, Time: 38.63 sec
Epoch: [22]/(600/1313), Train Loss: 1.0677, Accuracy: 0.70, Time: 59.07 sec
Epoch: [22]/(800/1313), Train Loss: 1.0735, Accuracy: 0.70, Time: 79.63 sec
Epoch: [22]/(1000/1313), Train Loss: 0.7040, Accuracy: 0.70, Time: 99.82 sec
Epoch: [22]/(1200/1313), Train Loss: 1.0743, Accuracy: 0.70, Time: 119.00 sec
Epoch: [22], Test Loss: 1.1089, Accuracy: 0.65, Time: 28.07 sec


Epoch: [23]/(200/1313), Train Loss: 1.2537, Accuracy: 0.69, Time: 19.89 sec
Epoch: [23]/(400/1313), Train Loss: 0.7206, Accuracy: 0.70, Time: 38.44 sec
Epoch: [23]/(600/1313), Train Loss: 0.9147, Accuracy: 0.70, Time: 58.66 sec
Epoch: [23]/(800/1313), Train Loss: 0.8987, Accuracy: 0.71, Time: 79.08 sec
Epoch: [23]/(1000/1313), Train Loss: 1.1127, Accuracy: 0.71, Time: 98.95 sec
Epoch: [23]/(1200/1313), Train Loss: 1.3994, Accuracy: 0.71, Time: 118.00 sec
Epoch: [23], Test Loss: 1.0223, Accuracy: 0.67, Time: 28.12 sec


Epoch: [24]/(200/1313), Train Loss: 1.1306, Accuracy: 0.71, Time: 19.52 sec
Epoch: [24]/(400/1313), Train Loss: 0.9989, Accuracy: 0.71, Time: 38.36 sec
Epoch: [24]/(600/1313), Train Loss: 0.8794, Accuracy: 0.71, Time: 58.51 sec
Epoch: [24]/(800/1313), Train Loss: 1.0633, Accuracy: 0.71, Time: 78.95 sec
Epoch: [24]/(1000/1313), Train Loss: 0.7188, Accuracy: 0.71, Time: 99.03 sec
Epoch: [24]/(1200/1313), Train Loss: 1.1573, Accuracy: 0.71, Time: 118.11 sec
Epoch: [24], Test Loss: 1.0124, Accuracy: 0.67, Time: 28.15 sec


Epoch: [25]/(200/1313), Train Loss: 0.9527, Accuracy: 0.72, Time: 19.62 sec
Epoch: [25]/(400/1313), Train Loss: 1.1366, Accuracy: 0.72, Time: 38.47 sec
Epoch: [25]/(600/1313), Train Loss: 1.0515, Accuracy: 0.72, Time: 58.67 sec
Epoch: [25]/(800/1313), Train Loss: 0.9031, Accuracy: 0.72, Time: 79.04 sec
Epoch: [25]/(1000/1313), Train Loss: 0.9629, Accuracy: 0.72, Time: 98.93 sec
Epoch: [25]/(1200/1313), Train Loss: 0.9998, Accuracy: 0.72, Time: 117.90 sec
Epoch: [25], Test Loss: 0.9979, Accuracy: 0.68, Time: 28.22 sec


Epoch: [26]/(200/1313), Train Loss: 1.2433, Accuracy: 0.73, Time: 19.49 sec
Epoch: [26]/(400/1313), Train Loss: 1.0198, Accuracy: 0.73, Time: 38.06 sec
Epoch: [26]/(600/1313), Train Loss: 0.8578, Accuracy: 0.73, Time: 58.28 sec
Epoch: [26]/(800/1313), Train Loss: 0.7353, Accuracy: 0.73, Time: 78.59 sec
Epoch: [26]/(1000/1313), Train Loss: 0.7619, Accuracy: 0.73, Time: 98.58 sec
```

```
Epoch: [26]/(1200/1313), Train Loss: 0.9773, Accuracy: 0.73, Time: 117.78 sec
Epoch: [26], Test Loss: 1.0013, Accuracy: 0.67, Time: 28.13 sec


Epoch: [27]/(200/1313), Train Loss: 1.0928, Accuracy: 0.74, Time: 19.90 sec
Epoch: [27]/(400/1313), Train Loss: 0.8805, Accuracy: 0.74, Time: 38.70 sec
Epoch: [27]/(600/1313), Train Loss: 1.1703, Accuracy: 0.74, Time: 58.93 sec
Epoch: [27]/(800/1313), Train Loss: 0.8545, Accuracy: 0.74, Time: 79.77 sec
Epoch: [27]/(1000/1313), Train Loss: 0.8006, Accuracy: 0.74, Time: 100.07 sec
Epoch: [27]/(1200/1313), Train Loss: 1.1946, Accuracy: 0.74, Time: 119.30 sec
Epoch: [27], Test Loss: 0.9941, Accuracy: 0.68, Time: 28.40 sec


Epoch: [28]/(200/1313), Train Loss: 0.9659, Accuracy: 0.75, Time: 19.39 sec
Epoch: [28]/(400/1313), Train Loss: 1.2280, Accuracy: 0.75, Time: 37.89 sec
Epoch: [28]/(600/1313), Train Loss: 0.6505, Accuracy: 0.75, Time: 58.04 sec
Epoch: [28]/(800/1313), Train Loss: 0.7234, Accuracy: 0.75, Time: 78.29 sec
Epoch: [28]/(1000/1313), Train Loss: 0.8345, Accuracy: 0.75, Time: 98.69 sec
Epoch: [28]/(1200/1313), Train Loss: 0.9203, Accuracy: 0.75, Time: 117.95 sec
Epoch: [28], Test Loss: 1.0100, Accuracy: 0.68, Time: 28.70 sec


Epoch: [29]/(200/1313), Train Loss: 1.0701, Accuracy: 0.73, Time: 19.70 sec
Epoch: [29]/(400/1313), Train Loss: 0.6834, Accuracy: 0.74, Time: 38.90 sec
Epoch: [29]/(600/1313), Train Loss: 1.0724, Accuracy: 0.74, Time: 59.47 sec
Epoch: [29]/(800/1313), Train Loss: 0.5303, Accuracy: 0.74, Time: 79.87 sec
Epoch: [29]/(1000/1313), Train Loss: 0.7174, Accuracy: 0.75, Time: 100.29 sec
Epoch: [29]/(1200/1313), Train Loss: 1.2518, Accuracy: 0.75, Time: 119.40 sec
Epoch: [29], Test Loss: 0.9363, Accuracy: 0.69, Time: 28.54 sec


Epoch: [30]/(200/1313), Train Loss: 1.0479, Accuracy: 0.74, Time: 19.77 sec
Epoch: [30]/(400/1313), Train Loss: 0.5991, Accuracy: 0.75, Time: 38.88 sec
Epoch: [30]/(600/1313), Train Loss: 0.6637, Accuracy: 0.75, Time: 59.36 sec
Epoch: [30]/(800/1313), Train Loss: 0.6587, Accuracy: 0.75, Time: 80.13 sec
Epoch: [30]/(1000/1313), Train Loss: 1.1482, Accuracy: 0.75, Time: 100.68 sec
Epoch: [30]/(1200/1313), Train Loss: 0.6469, Accuracy: 0.75, Time: 120.20 sec
Epoch: [30], Test Loss: 0.9872, Accuracy: 0.68, Time: 28.29 sec


Epoch: [31]/(200/1313), Train Loss: 1.0569, Accuracy: 0.75, Time: 19.76 sec
Epoch: [31]/(400/1313), Train Loss: 0.8583, Accuracy: 0.76, Time: 38.40 sec
Epoch: [31]/(600/1313), Train Loss: 0.5108, Accuracy: 0.76, Time: 58.67 sec
Epoch: [31]/(800/1313), Train Loss: 0.5190, Accuracy: 0.76, Time: 79.39 sec
Epoch: [31]/(1000/1313), Train Loss: 0.8198, Accuracy: 0.76, Time: 99.65 sec
Epoch: [31]/(1200/1313), Train Loss: 0.8474, Accuracy: 0.76, Time: 118.83 sec
Epoch: [31], Test Loss: 0.9660, Accuracy: 0.69, Time: 28.44 sec
```

```
Epoch: [32]/(200/1313), Train Loss: 1.1824, Accuracy: 0.76, Time: 19.97 sec
Epoch: [32]/(400/1313), Train Loss: 0.9135, Accuracy: 0.76, Time: 38.83 sec
Epoch: [32]/(600/1313), Train Loss: 1.2063, Accuracy: 0.76, Time: 58.90 sec
Epoch: [32]/(800/1313), Train Loss: 0.6442, Accuracy: 0.76, Time: 79.50 sec
Epoch: [32]/(1000/1313), Train Loss: 0.9931, Accuracy: 0.76, Time: 99.59 sec
Epoch: [32]/(1200/1313), Train Loss: 0.8511, Accuracy: 0.76, Time: 118.70 sec
Epoch: [32], Test Loss: 0.9252, Accuracy: 0.71, Time: 28.77 sec


Epoch: [33]/(200/1313), Train Loss: 0.9198, Accuracy: 0.77, Time: 19.84 sec
Epoch: [33]/(400/1313), Train Loss: 0.4350, Accuracy: 0.77, Time: 38.53 sec
Epoch: [33]/(600/1313), Train Loss: 0.5121, Accuracy: 0.77, Time: 58.95 sec
Epoch: [33]/(800/1313), Train Loss: 0.6301, Accuracy: 0.77, Time: 79.36 sec
Epoch: [33]/(1000/1313), Train Loss: 0.7429, Accuracy: 0.77, Time: 99.67 sec
Epoch: [33]/(1200/1313), Train Loss: 0.7326, Accuracy: 0.77, Time: 118.94 sec
Epoch: [33], Test Loss: 0.9458, Accuracy: 0.71, Time: 28.23 sec


Epoch: [34]/(200/1313), Train Loss: 1.2881, Accuracy: 0.77, Time: 19.81 sec
Epoch: [34]/(400/1313), Train Loss: 0.7538, Accuracy: 0.77, Time: 38.70 sec
Epoch: [34]/(600/1313), Train Loss: 0.6097, Accuracy: 0.77, Time: 59.00 sec
Epoch: [34]/(800/1313), Train Loss: 0.4673, Accuracy: 0.78, Time: 79.47 sec
Epoch: [34]/(1000/1313), Train Loss: 0.6931, Accuracy: 0.78, Time: 99.85 sec
Epoch: [34]/(1200/1313), Train Loss: 0.9005, Accuracy: 0.78, Time: 118.97 sec
Epoch: [34], Test Loss: 0.9379, Accuracy: 0.71, Time: 28.31 sec


Epoch: [35]/(200/1313), Train Loss: 0.8796, Accuracy: 0.78, Time: 19.78 sec
Epoch: [35]/(400/1313), Train Loss: 0.8178, Accuracy: 0.78, Time: 38.84 sec
Epoch: [35]/(600/1313), Train Loss: 0.4487, Accuracy: 0.78, Time: 59.16 sec
Epoch: [35]/(800/1313), Train Loss: 0.5868, Accuracy: 0.78, Time: 79.56 sec
Epoch: [35]/(1000/1313), Train Loss: 0.7715, Accuracy: 0.78, Time: 99.76 sec
Epoch: [35]/(1200/1313), Train Loss: 0.7553, Accuracy: 0.78, Time: 118.79 sec
Epoch: [35], Test Loss: 0.9214, Accuracy: 0.71, Time: 28.22 sec


Epoch: [36]/(200/1313), Train Loss: 1.2110, Accuracy: 0.78, Time: 20.10 sec
Epoch: [36]/(400/1313), Train Loss: 0.5610, Accuracy: 0.79, Time: 38.82 sec
Epoch: [36]/(600/1313), Train Loss: 0.6360, Accuracy: 0.78, Time: 59.42 sec
Epoch: [36]/(800/1313), Train Loss: 0.4841, Accuracy: 0.78, Time: 79.94 sec
Epoch: [36]/(1000/1313), Train Loss: 0.5175, Accuracy: 0.78, Time: 100.32 sec
Epoch: [36]/(1200/1313), Train Loss: 0.5332, Accuracy: 0.78, Time: 119.34 sec
Epoch: [36], Test Loss: 0.8866, Accuracy: 0.72, Time: 28.39 sec


Epoch: [37]/(200/1313), Train Loss: 0.8045, Accuracy: 0.78, Time: 19.91 sec
Epoch: [37]/(400/1313), Train Loss: 0.7002, Accuracy: 0.79, Time: 38.57 sec
```

```
Epoch: [37]/(600/1313), Train Loss: 0.3976, Accuracy: 0.79, Time: 58.68 sec
Epoch: [37]/(800/1313), Train Loss: 0.4854, Accuracy: 0.79, Time: 79.19 sec
Epoch: [37]/(1000/1313), Train Loss: 0.5202, Accuracy: 0.79, Time: 99.22 sec
Epoch: [37]/(1200/1313), Train Loss: 0.6422, Accuracy: 0.79, Time: 118.16 sec
Epoch: [37], Test Loss: 0.9356, Accuracy: 0.71, Time: 27.36 sec


Epoch: [38]/(200/1313), Train Loss: 1.1827, Accuracy: 0.79, Time: 19.22 sec
Epoch: [38]/(400/1313), Train Loss: 0.6423, Accuracy: 0.80, Time: 37.42 sec
Epoch: [38]/(600/1313), Train Loss: 0.6655, Accuracy: 0.80, Time: 56.52 sec
Epoch: [38]/(800/1313), Train Loss: 0.5600, Accuracy: 0.80, Time: 75.70 sec
Epoch: [38]/(1000/1313), Train Loss: 0.7238, Accuracy: 0.80, Time: 94.77 sec
Epoch: [38]/(1200/1313), Train Loss: 0.8187, Accuracy: 0.80, Time: 112.85 sec
Epoch: [38], Test Loss: 0.9899, Accuracy: 0.70, Time: 26.35 sec


Epoch: [39]/(200/1313), Train Loss: 1.0378, Accuracy: 0.80, Time: 18.53 sec
Epoch: [39]/(400/1313), Train Loss: 0.5019, Accuracy: 0.80, Time: 36.15 sec
Epoch: [39]/(600/1313), Train Loss: 0.4499, Accuracy: 0.80, Time: 55.16 sec
Epoch: [39]/(800/1313), Train Loss: 0.3827, Accuracy: 0.80, Time: 74.12 sec
Epoch: [39]/(1000/1313), Train Loss: 0.6664, Accuracy: 0.80, Time: 92.73 sec
Epoch: [39]/(1200/1313), Train Loss: 0.6476, Accuracy: 0.80, Time: 110.39 sec
Epoch: [39], Test Loss: 0.9180, Accuracy: 0.71, Time: 26.00 sec


Epoch: [40]/(200/1313), Train Loss: 0.9768, Accuracy: 0.80, Time: 18.26 sec
Epoch: [40]/(400/1313), Train Loss: 0.5568, Accuracy: 0.80, Time: 35.98 sec
Epoch: [40]/(600/1313), Train Loss: 0.6832, Accuracy: 0.80, Time: 54.80 sec
Epoch: [40]/(800/1313), Train Loss: 0.3376, Accuracy: 0.80, Time: 73.74 sec
Epoch: [40]/(1000/1313), Train Loss: 0.4778, Accuracy: 0.80, Time: 92.25 sec
Epoch: [40]/(1200/1313), Train Loss: 0.9331, Accuracy: 0.80, Time: 110.25 sec
Epoch: [40], Test Loss: 0.8970, Accuracy: 0.72, Time: 25.97 sec


Epoch: [41]/(200/1313), Train Loss: 1.2325, Accuracy: 0.81, Time: 18.47 sec
Epoch: [41]/(400/1313), Train Loss: 0.6899, Accuracy: 0.81, Time: 35.69 sec
Epoch: [41]/(600/1313), Train Loss: 0.6057, Accuracy: 0.81, Time: 54.36 sec
Epoch: [41]/(800/1313), Train Loss: 0.5088, Accuracy: 0.81, Time: 73.48 sec
Epoch: [41]/(1000/1313), Train Loss: 0.3888, Accuracy: 0.81, Time: 92.04 sec
Epoch: [41]/(1200/1313), Train Loss: 0.6284, Accuracy: 0.81, Time: 109.47 sec
Epoch: [41], Test Loss: 0.9048, Accuracy: 0.73, Time: 25.99 sec


Epoch: [42]/(200/1313), Train Loss: 0.7908, Accuracy: 0.80, Time: 18.64 sec
Epoch: [42]/(400/1313), Train Loss: 0.9761, Accuracy: 0.81, Time: 36.35 sec
Epoch: [42]/(600/1313), Train Loss: 0.3294, Accuracy: 0.81, Time: 55.25 sec
Epoch: [42]/(800/1313), Train Loss: 0.3428, Accuracy: 0.81, Time: 74.34 sec
Epoch: [42]/(1000/1313), Train Loss: 0.2913, Accuracy: 0.81, Time: 93.38 sec
```

```
Epoch: [42]/(1200/1313), Train Loss: 0.5109, Accuracy: 0.81, Time: 111.32 sec
Epoch: [42], Test Loss: 0.9266, Accuracy: 0.72, Time: 26.30 sec


Epoch: [43]/(200/1313), Train Loss: 0.8884, Accuracy: 0.81, Time: 18.53 sec
Epoch: [43]/(400/1313), Train Loss: 0.4579, Accuracy: 0.81, Time: 36.06 sec
Epoch: [43]/(600/1313), Train Loss: 0.4569, Accuracy: 0.81, Time: 54.98 sec
Epoch: [43]/(800/1313), Train Loss: 0.5099, Accuracy: 0.81, Time: 74.08 sec
Epoch: [43]/(1000/1313), Train Loss: 0.7001, Accuracy: 0.82, Time: 92.81 sec
Epoch: [43]/(1200/1313), Train Loss: 0.7757, Accuracy: 0.82, Time: 110.84 sec
Epoch: [43], Test Loss: 0.9154, Accuracy: 0.72, Time: 25.76 sec


Epoch: [44]/(200/1313), Train Loss: 0.6164, Accuracy: 0.82, Time: 18.39 sec
Epoch: [44]/(400/1313), Train Loss: 0.3752, Accuracy: 0.82, Time: 35.83 sec
Epoch: [44]/(600/1313), Train Loss: 0.5603, Accuracy: 0.81, Time: 54.68 sec
Epoch: [44]/(800/1313), Train Loss: 0.6026, Accuracy: 0.81, Time: 73.54 sec
Epoch: [44]/(1000/1313), Train Loss: 0.2721, Accuracy: 0.82, Time: 91.94 sec
Epoch: [44]/(1200/1313), Train Loss: 0.6620, Accuracy: 0.82, Time: 109.64 sec
Epoch: [44], Test Loss: 0.8495, Accuracy: 0.75, Time: 25.70 sec


Epoch: [45]/(200/1313), Train Loss: 0.7810, Accuracy: 0.82, Time: 18.16 sec
Epoch: [45]/(400/1313), Train Loss: 0.3107, Accuracy: 0.83, Time: 35.55 sec
Epoch: [45]/(600/1313), Train Loss: 0.5313, Accuracy: 0.82, Time: 54.43 sec
Epoch: [45]/(800/1313), Train Loss: 0.5250, Accuracy: 0.83, Time: 73.46 sec
Epoch: [45]/(1000/1313), Train Loss: 0.4199, Accuracy: 0.83, Time: 92.45 sec
Epoch: [45]/(1200/1313), Train Loss: 0.5467, Accuracy: 0.83, Time: 110.41 sec
Epoch: [45], Test Loss: 0.8903, Accuracy: 0.73, Time: 25.95 sec


Epoch: [46]/(200/1313), Train Loss: 0.7795, Accuracy: 0.82, Time: 18.20 sec
Epoch: [46]/(400/1313), Train Loss: 0.5197, Accuracy: 0.83, Time: 35.56 sec
Epoch: [46]/(600/1313), Train Loss: 0.4787, Accuracy: 0.83, Time: 54.17 sec
Epoch: [46]/(800/1313), Train Loss: 0.5589, Accuracy: 0.83, Time: 73.39 sec
Epoch: [46]/(1000/1313), Train Loss: 0.7196, Accuracy: 0.83, Time: 92.21 sec
Epoch: [46]/(1200/1313), Train Loss: 0.7187, Accuracy: 0.83, Time: 110.00 sec
Epoch: [46], Test Loss: 0.9443, Accuracy: 0.72, Time: 25.81 sec


Epoch: [47]/(200/1313), Train Loss: 0.6378, Accuracy: 0.84, Time: 18.46 sec
Epoch: [47]/(400/1313), Train Loss: 0.5868, Accuracy: 0.83, Time: 35.84 sec
Epoch: [47]/(600/1313), Train Loss: 0.5212, Accuracy: 0.83, Time: 54.71 sec
Epoch: [47]/(800/1313), Train Loss: 0.2629, Accuracy: 0.83, Time: 73.54 sec
Epoch: [47]/(1000/1313), Train Loss: 0.3397, Accuracy: 0.83, Time: 92.25 sec
Epoch: [47]/(1200/1313), Train Loss: 0.6111, Accuracy: 0.83, Time: 110.11 sec
Epoch: [47], Test Loss: 0.8772, Accuracy: 0.75, Time: 26.09 sec
```

```
Epoch: [48]/(200/1313), Train Loss: 1.0328, Accuracy: 0.84, Time: 18.34 sec
Epoch: [48]/(400/1313), Train Loss: 0.3829, Accuracy: 0.83, Time: 35.89 sec
Epoch: [48]/(600/1313), Train Loss: 0.4914, Accuracy: 0.83, Time: 54.95 sec
Epoch: [48]/(800/1313), Train Loss: 0.3744, Accuracy: 0.83, Time: 74.15 sec
Epoch: [48]/(1000/1313), Train Loss: 0.2935, Accuracy: 0.83, Time: 92.83 sec
Epoch: [48]/(1200/1313), Train Loss: 0.4274, Accuracy: 0.84, Time: 110.92 sec
Epoch: [48], Test Loss: 0.9358, Accuracy: 0.73, Time: 25.73 sec


Epoch: [49]/(200/1313), Train Loss: 0.9036, Accuracy: 0.83, Time: 18.11 sec
Epoch: [49]/(400/1313), Train Loss: 0.9480, Accuracy: 0.83, Time: 35.41 sec
Epoch: [49]/(600/1313), Train Loss: 0.2704, Accuracy: 0.83, Time: 54.12 sec
Epoch: [49]/(800/1313), Train Loss: 0.3130, Accuracy: 0.84, Time: 72.92 sec
Epoch: [49]/(1000/1313), Train Loss: 0.3617, Accuracy: 0.84, Time: 91.38 sec
Epoch: [49]/(1200/1313), Train Loss: 0.7787, Accuracy: 0.84, Time: 109.19 sec
Epoch: [49], Test Loss: 0.9221, Accuracy: 0.73, Time: 25.88 sec


Epoch: [50]/(200/1313), Train Loss: 0.7716, Accuracy: 0.84, Time: 18.10 sec
Epoch: [50]/(400/1313), Train Loss: 0.2469, Accuracy: 0.85, Time: 35.60 sec
Epoch: [50]/(600/1313), Train Loss: 0.2116, Accuracy: 0.84, Time: 54.67 sec
Epoch: [50]/(800/1313), Train Loss: 0.2140, Accuracy: 0.84, Time: 73.49 sec
Epoch: [50]/(1000/1313), Train Loss: 0.3810, Accuracy: 0.84, Time: 92.15 sec
Epoch: [50]/(1200/1313), Train Loss: 0.7223, Accuracy: 0.84, Time: 109.89 sec
Epoch: [50], Test Loss: 0.8837, Accuracy: 0.75, Time: 25.87 sec
```

0.0.10 Plot Train-Test Loss Curve

[ ]:
```python
plt.figure(figsize=(8, 5))
plt.plot(range(1, len(train_loss)+1), train_loss, 'g', label='Training Loss')
plt.plot(range(1, len(test_loss)+1), test_loss, 'b', label='Testing Loss')

plt.title('Training and Testing loss')
plt.xlabel('Epochs')
plt.ylabel('Loss')
plt.legend()
plt.show()
```

0.0.11 Test on some random images

[14]:
```
translate = {
    "cane": "dog",
    "cavallo": "horse",
    "elefante": "elephant",
    "farfalla": "butterfly",
    "gallina": "chicken",
    "gatto": "cat",
    "mucca": "cow",
    "pecora": "sheep",
    "ragno": "spider",
    "scoiattolo": "squirrel",
}

translate = {x:translate[x] for x in train_dataloader.dataset.dataset.classes}
```

[15]:
```
# # Uncomment the below two lines if you want to use the pre trained model for␣
 ↪50 epoch
# model = torch.load('BasicCNN_Pytorch/model_50.pth', map_location=device)
# model.eval()
```

```
denormalize = transforms.Compose([
    transforms.Normalize(mean = -mean/std, std = 1./std),
    transforms.ToPILImage()
])


with torch.no_grad():

    for impath in os.listdir('BasicCNN_Pytorch/test_images/'):
        try:
            image = Image.open(f'BasicCNN_Pytorch/test_images/{impath}')
        except:
            continue

        image = transforms.Compose([
            transforms.Resize(256),
            transforms.CenterCrop(256),
            transforms.ToTensor(),
            transforms.Normalize(mean=mean, std=std)
        ])(image)

        image_tensor = image.view(1,3,256,256).to(device)

        moutput = model(image_tensor)
        moutput = nn.Softmax(dim=1)(moutput)[0]*100

        idx = moutput.argmax().data.item()
        oclass = list(translate.keys())[idx]
        moutput = moutput.int().data.cpu().numpy()

        display(denormalize(image))
        print(translate[oclass], ':', moutput[idx], '%', '\n\n')

model.train()
pass
```

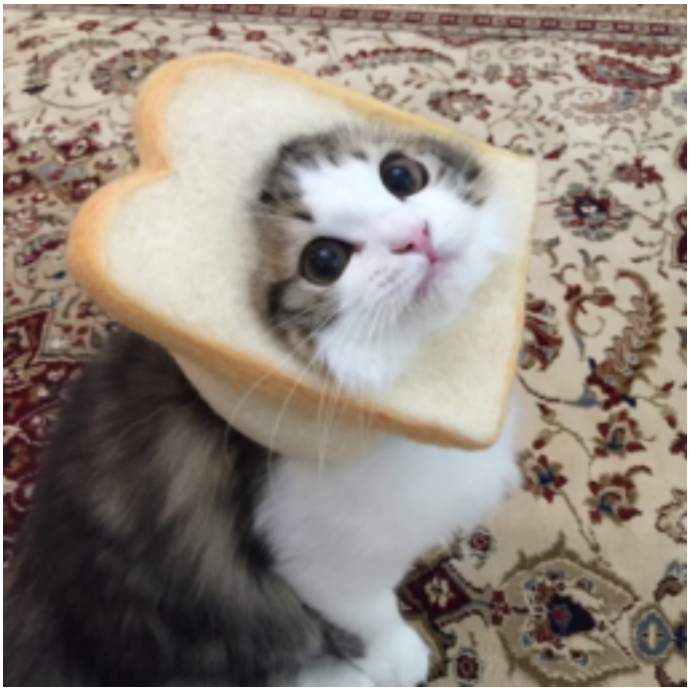
```
chicken : 100 %
```

```
spider : 98 %
```

```
dog : 65 %
```

```
squirrel : 98 %
```

```
dog : 97 %
```



```
cat : 77 %
```

```
elephant : 99 %
```

```
sheep : 99 %
```

```
dog : 98 %
```

```
horse : 40 %
```

```
dog : 86 %
```

```
butterfly : 99 %
```

```
elephant : 100 %
```

```
dog : 100 %
```

```
horse : 99 %
```

0.0.12 Try Training for another 50 epochs

[ ]:
```
model.train()

for epoch in range(51,101):
    train_loss.append(Train(epoch,94))
    test_loss.append(Test(epoch))

    print('\n')

    if epoch % 10 == 0:
        torch.save(model, 'model_'+str(epoch)+'.pth')
```

```
Epoch: [51]/(94/1313), Train Loss: 0.3074, Accuracy: 0.86, Time: 8.80 sec
Epoch: [51]/(188/1313), Train Loss: 0.3984, Accuracy: 0.86, Time: 17.49 sec
Epoch: [51]/(282/1313), Train Loss: 0.5296, Accuracy: 0.85, Time: 26.32 sec
Epoch: [51]/(376/1313), Train Loss: 0.6989, Accuracy: 0.86, Time: 33.97 sec
```

```
Epoch: [51]/(470/1313), Train Loss: 0.4635, Accuracy: 0.86, Time: 41.99 sec
Epoch: [51]/(564/1313), Train Loss: 0.3324, Accuracy: 0.85, Time: 50.50 sec
Epoch: [51]/(658/1313), Train Loss: 0.7592, Accuracy: 0.85, Time: 59.71 sec
Epoch: [51]/(752/1313), Train Loss: 0.5850, Accuracy: 0.85, Time: 69.12 sec
Epoch: [51]/(846/1313), Train Loss: 0.5018, Accuracy: 0.85, Time: 77.41 sec
Epoch: [51]/(940/1313), Train Loss: 0.5039, Accuracy: 0.85, Time: 85.96 sec
Epoch: [51]/(1034/1313), Train Loss: 0.5657, Accuracy: 0.85, Time: 95.31 sec
Epoch: [51]/(1128/1313), Train Loss: 0.3155, Accuracy: 0.85, Time: 102.97 sec
Epoch: [51]/(1222/1313), Train Loss: 0.3265, Accuracy: 0.85, Time: 111.42 sec
Epoch: [51], Test Loss: 0.9314, Accuracy: 0.74, Time: 26.37 sec


Epoch: [52]/(94/1313), Train Loss: 0.3680, Accuracy: 0.85, Time: 8.73 sec
Epoch: [52]/(188/1313), Train Loss: 0.6548, Accuracy: 0.85, Time: 17.57 sec
Epoch: [52]/(282/1313), Train Loss: 0.4911, Accuracy: 0.85, Time: 26.46 sec
Epoch: [52]/(376/1313), Train Loss: 0.8200, Accuracy: 0.85, Time: 34.26 sec
Epoch: [52]/(470/1313), Train Loss: 0.4761, Accuracy: 0.85, Time: 42.24 sec
Epoch: [52]/(564/1313), Train Loss: 0.1608, Accuracy: 0.85, Time: 51.06 sec
Epoch: [52]/(658/1313), Train Loss: 0.4623, Accuracy: 0.85, Time: 60.15 sec
Epoch: [52]/(752/1313), Train Loss: 0.6949, Accuracy: 0.85, Time: 69.61 sec
Epoch: [52]/(846/1313), Train Loss: 0.6510, Accuracy: 0.85, Time: 78.00 sec
Epoch: [52]/(940/1313), Train Loss: 0.4210, Accuracy: 0.85, Time: 86.80 sec
Epoch: [52]/(1034/1313), Train Loss: 0.4042, Accuracy: 0.85, Time: 96.15 sec
Epoch: [52]/(1128/1313), Train Loss: 0.3126, Accuracy: 0.85, Time: 103.87 sec
Epoch: [52]/(1222/1313), Train Loss: 0.3640, Accuracy: 0.85, Time: 112.59 sec
Epoch: [52], Test Loss: 0.9652, Accuracy: 0.73, Time: 26.52 sec


Epoch: [53]/(94/1313), Train Loss: 0.2649, Accuracy: 0.85, Time: 8.77 sec
Epoch: [53]/(188/1313), Train Loss: 0.2773, Accuracy: 0.86, Time: 17.46 sec
Epoch: [53]/(282/1313), Train Loss: 0.4046, Accuracy: 0.86, Time: 26.25 sec
Epoch: [53]/(376/1313), Train Loss: 0.8230, Accuracy: 0.86, Time: 33.64 sec
Epoch: [53]/(470/1313), Train Loss: 0.6339, Accuracy: 0.86, Time: 41.57 sec
Epoch: [53]/(564/1313), Train Loss: 0.1855, Accuracy: 0.86, Time: 50.21 sec
Epoch: [53]/(658/1313), Train Loss: 0.7928, Accuracy: 0.86, Time: 59.37 sec
Epoch: [53]/(752/1313), Train Loss: 0.6198, Accuracy: 0.85, Time: 68.98 sec
Epoch: [53]/(846/1313), Train Loss: 0.2673, Accuracy: 0.85, Time: 77.27 sec
Epoch: [53]/(940/1313), Train Loss: 0.2933, Accuracy: 0.85, Time: 86.03 sec
Epoch: [53]/(1034/1313), Train Loss: 0.3847, Accuracy: 0.85, Time: 95.22 sec
Epoch: [53]/(1128/1313), Train Loss: 0.1317, Accuracy: 0.85, Time: 102.88 sec
Epoch: [53]/(1222/1313), Train Loss: 0.3642, Accuracy: 0.85, Time: 111.45 sec
Epoch: [53], Test Loss: 0.8901, Accuracy: 0.75, Time: 25.74 sec


Epoch: [54]/(94/1313), Train Loss: 0.2349, Accuracy: 0.86, Time: 8.73 sec
Epoch: [54]/(188/1313), Train Loss: 0.5697, Accuracy: 0.85, Time: 17.41 sec
Epoch: [54]/(282/1313), Train Loss: 0.2465, Accuracy: 0.85, Time: 26.24 sec
Epoch: [54]/(376/1313), Train Loss: 0.5616, Accuracy: 0.86, Time: 33.81 sec
```

```
Epoch: [54]/(470/1313), Train Loss: 0.1574, Accuracy: 0.86, Time: 41.88 sec
Epoch: [54]/(564/1313), Train Loss: 0.1518, Accuracy: 0.86, Time: 50.66 sec
Epoch: [54]/(658/1313), Train Loss: 0.7593, Accuracy: 0.86, Time: 59.80 sec
Epoch: [54]/(752/1313), Train Loss: 0.4943, Accuracy: 0.86, Time: 69.45 sec
Epoch: [54]/(846/1313), Train Loss: 0.4294, Accuracy: 0.86, Time: 77.72 sec
Epoch: [54]/(940/1313), Train Loss: 0.1738, Accuracy: 0.86, Time: 86.52 sec
Epoch: [54]/(1034/1313), Train Loss: 0.2680, Accuracy: 0.86, Time: 95.71 sec
Epoch: [54]/(1128/1313), Train Loss: 0.2766, Accuracy: 0.86, Time: 103.33 sec
Epoch: [54]/(1222/1313), Train Loss: 0.3897, Accuracy: 0.86, Time: 111.71 sec
Epoch: [54], Test Loss: 0.9176, Accuracy: 0.74, Time: 26.11 sec


Epoch: [55]/(94/1313), Train Loss: 0.2694, Accuracy: 0.86, Time: 8.70 sec
Epoch: [55]/(188/1313), Train Loss: 0.3342, Accuracy: 0.86, Time: 17.26 sec
Epoch: [55]/(282/1313), Train Loss: 0.2673, Accuracy: 0.85, Time: 25.98 sec
Epoch: [55]/(376/1313), Train Loss: 0.5780, Accuracy: 0.86, Time: 33.64 sec
Epoch: [55]/(470/1313), Train Loss: 0.2509, Accuracy: 0.86, Time: 41.51 sec
Epoch: [55]/(564/1313), Train Loss: 0.1775, Accuracy: 0.86, Time: 50.23 sec
Epoch: [55]/(658/1313), Train Loss: 0.7225, Accuracy: 0.85, Time: 59.36 sec
Epoch: [55]/(752/1313), Train Loss: 0.4455, Accuracy: 0.86, Time: 68.87 sec
Epoch: [55]/(846/1313), Train Loss: 0.4043, Accuracy: 0.86, Time: 77.27 sec
Epoch: [55]/(940/1313), Train Loss: 0.3289, Accuracy: 0.86, Time: 85.93 sec
Epoch: [55]/(1034/1313), Train Loss: 0.4304, Accuracy: 0.86, Time: 95.24 sec
Epoch: [55]/(1128/1313), Train Loss: 0.4523, Accuracy: 0.86, Time: 103.06 sec
Epoch: [55]/(1222/1313), Train Loss: 0.2906, Accuracy: 0.86, Time: 111.55 sec
Epoch: [55], Test Loss: 0.8999, Accuracy: 0.75, Time: 25.94 sec


Epoch: [56]/(94/1313), Train Loss: 0.3581, Accuracy: 0.87, Time: 8.64 sec
Epoch: [56]/(188/1313), Train Loss: 0.4976, Accuracy: 0.87, Time: 17.33 sec
Epoch: [56]/(282/1313), Train Loss: 0.3746, Accuracy: 0.87, Time: 26.11 sec
Epoch: [56]/(376/1313), Train Loss: 0.6692, Accuracy: 0.87, Time: 34.04 sec
Epoch: [56]/(470/1313), Train Loss: 0.1350, Accuracy: 0.87, Time: 42.04 sec
Epoch: [56]/(564/1313), Train Loss: 0.0395, Accuracy: 0.87, Time: 50.83 sec
Epoch: [56]/(658/1313), Train Loss: 0.6054, Accuracy: 0.86, Time: 60.08 sec
Epoch: [56]/(752/1313), Train Loss: 0.5738, Accuracy: 0.86, Time: 70.06 sec
Epoch: [56]/(846/1313), Train Loss: 0.1286, Accuracy: 0.86, Time: 78.56 sec
Epoch: [56]/(940/1313), Train Loss: 0.2423, Accuracy: 0.86, Time: 87.48 sec
Epoch: [56]/(1034/1313), Train Loss: 0.3616, Accuracy: 0.86, Time: 97.14 sec
Epoch: [56]/(1128/1313), Train Loss: 0.1160, Accuracy: 0.86, Time: 105.10 sec
Epoch: [56]/(1222/1313), Train Loss: 0.3171, Accuracy: 0.86, Time: 113.84 sec
Epoch: [56], Test Loss: 0.9443, Accuracy: 0.74, Time: 26.90 sec


Epoch: [57]/(94/1313), Train Loss: 0.2139, Accuracy: 0.88, Time: 8.83 sec
Epoch: [57]/(188/1313), Train Loss: 0.2558, Accuracy: 0.87, Time: 17.65 sec
Epoch: [57]/(282/1313), Train Loss: 0.1031, Accuracy: 0.87, Time: 26.71 sec
Epoch: [57]/(376/1313), Train Loss: 0.4672, Accuracy: 0.87, Time: 34.73 sec
```

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Epoch: [57]/(470/1313), Train Loss: 0.3181, Accuracy: 0.87, Time: 42.89 sec
Epoch: [57]/(564/1313), Train Loss: 0.1882, Accuracy: 0.86, Time: 51.90 sec
Epoch: [57]/(658/1313), Train Loss: 0.4843, Accuracy: 0.87, Time: 61.29 sec
Epoch: [57]/(752/1313), Train Loss: 1.2122, Accuracy: 0.87, Time: 71.24 sec
Epoch: [57]/(846/1313), Train Loss: 0.4126, Accuracy: 0.87, Time: 79.58 sec
Epoch: [57]/(940/1313), Train Loss: 0.4055, Accuracy: 0.87, Time: 88.55 sec
Epoch: [57]/(1034/1313), Train Loss: 0.5273, Accuracy: 0.87, Time: 98.10 sec
Epoch: [57]/(1128/1313), Train Loss: 0.4510, Accuracy: 0.87, Time: 105.99 sec
Epoch: [57]/(1222/1313), Train Loss: 0.1355, Accuracy: 0.87, Time: 114.52 sec
Epoch: [57], Test Loss: 0.9906, Accuracy: 0.73, Time: 26.12 sec


Epoch: [58]/(94/1313), Train Loss: 0.2665, Accuracy: 0.88, Time: 8.79 sec
Epoch: [58]/(188/1313), Train Loss: 0.4049, Accuracy: 0.87, Time: 17.45 sec
Epoch: [58]/(282/1313), Train Loss: 0.4985, Accuracy: 0.87, Time: 26.19 sec
Epoch: [58]/(376/1313), Train Loss: 0.6200, Accuracy: 0.87, Time: 33.80 sec
Epoch: [58]/(470/1313), Train Loss: 0.4074, Accuracy: 0.87, Time: 41.52 sec
Epoch: [58]/(564/1313), Train Loss: 0.2182, Accuracy: 0.86, Time: 50.09 sec
Epoch: [58]/(658/1313), Train Loss: 0.4905, Accuracy: 0.86, Time: 59.31 sec
Epoch: [58]/(752/1313), Train Loss: 0.6590, Accuracy: 0.86, Time: 68.75 sec
Epoch: [58]/(846/1313), Train Loss: 0.2772, Accuracy: 0.86, Time: 76.91 sec
Epoch: [58]/(940/1313), Train Loss: 0.1940, Accuracy: 0.86, Time: 85.64 sec
Epoch: [58]/(1034/1313), Train Loss: 0.3650, Accuracy: 0.87, Time: 94.83 sec
Epoch: [58]/(1128/1313), Train Loss: 0.2589, Accuracy: 0.87, Time: 102.50 sec
Epoch: [58]/(1222/1313), Train Loss: 0.4369, Accuracy: 0.87, Time: 110.87 sec
Epoch: [58], Test Loss: 1.0279, Accuracy: 0.73, Time: 26.14 sec


Epoch: [59]/(94/1313), Train Loss: 0.4910, Accuracy: 0.88, Time: 8.89 sec
Epoch: [59]/(188/1313), Train Loss: 0.3228, Accuracy: 0.88, Time: 17.50 sec
Epoch: [59]/(282/1313), Train Loss: 0.2286, Accuracy: 0.87, Time: 26.18 sec
Epoch: [59]/(376/1313), Train Loss: 0.5883, Accuracy: 0.87, Time: 33.83 sec
Epoch: [59]/(470/1313), Train Loss: 0.1969, Accuracy: 0.87, Time: 41.59 sec
Epoch: [59]/(564/1313), Train Loss: 0.2434, Accuracy: 0.87, Time: 50.26 sec
Epoch: [59]/(658/1313), Train Loss: 0.4457, Accuracy: 0.86, Time: 59.32 sec
Epoch: [59]/(752/1313), Train Loss: 0.2693, Accuracy: 0.86, Time: 68.90 sec
Epoch: [59]/(846/1313), Train Loss: 0.4191, Accuracy: 0.87, Time: 77.34 sec
Epoch: [59]/(940/1313), Train Loss: 0.4002, Accuracy: 0.87, Time: 85.99 sec
Epoch: [59]/(1034/1313), Train Loss: 0.3894, Accuracy: 0.87, Time: 95.32 sec
Epoch: [59]/(1128/1313), Train Loss: 0.1953, Accuracy: 0.87, Time: 102.93 sec
Epoch: [59]/(1222/1313), Train Loss: 0.2113, Accuracy: 0.87, Time: 111.56 sec
Epoch: [59], Test Loss: 0.9925, Accuracy: 0.74, Time: 25.66 sec


Epoch: [60]/(94/1313), Train Loss: 0.3049, Accuracy: 0.88, Time: 8.69 sec
Epoch: [60]/(188/1313), Train Loss: 0.4071, Accuracy: 0.87, Time: 17.24 sec
Epoch: [60]/(282/1313), Train Loss: 0.3036, Accuracy: 0.87, Time: 25.92 sec
Epoch: [60]/(376/1313), Train Loss: 0.8987, Accuracy: 0.87, Time: 33.51 sec
```

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Epoch: [60]/(470/1313), Train Loss: 0.1297, Accuracy: 0.87, Time: 41.37 sec
Epoch: [60]/(564/1313), Train Loss: 0.3197, Accuracy: 0.87, Time: 49.91 sec
Epoch: [60]/(658/1313), Train Loss: 0.2535, Accuracy: 0.87, Time: 58.93 sec
Epoch: [60]/(752/1313), Train Loss: 0.6410, Accuracy: 0.87, Time: 68.32 sec
Epoch: [60]/(846/1313), Train Loss: 0.4142, Accuracy: 0.87, Time: 76.78 sec
Epoch: [60]/(940/1313), Train Loss: 0.5721, Accuracy: 0.87, Time: 85.36 sec
Epoch: [60]/(1034/1313), Train Loss: 0.3767, Accuracy: 0.87, Time: 94.68 sec
Epoch: [60]/(1128/1313), Train Loss: 0.1415, Accuracy: 0.87, Time: 102.54 sec
Epoch: [60]/(1222/1313), Train Loss: 0.3795, Accuracy: 0.87, Time: 111.07 sec
Epoch: [60], Test Loss: 0.9380, Accuracy: 0.75, Time: 25.68 sec


Epoch: [61]/(94/1313), Train Loss: 0.1540, Accuracy: 0.89, Time: 8.73 sec
Epoch: [61]/(188/1313), Train Loss: 0.2209, Accuracy: 0.87, Time: 17.31 sec
Epoch: [61]/(282/1313), Train Loss: 0.2508, Accuracy: 0.87, Time: 26.09 sec
Epoch: [61]/(376/1313), Train Loss: 0.5208, Accuracy: 0.87, Time: 33.83 sec
Epoch: [61]/(470/1313), Train Loss: 0.2713, Accuracy: 0.87, Time: 41.64 sec
Epoch: [61]/(564/1313), Train Loss: 0.1751, Accuracy: 0.87, Time: 50.25 sec
Epoch: [61]/(658/1313), Train Loss: 0.9407, Accuracy: 0.87, Time: 59.28 sec
Epoch: [61]/(752/1313), Train Loss: 0.3761, Accuracy: 0.87, Time: 68.77 sec
Epoch: [61]/(846/1313), Train Loss: 0.3975, Accuracy: 0.87, Time: 76.98 sec
Epoch: [61]/(940/1313), Train Loss: 0.1355, Accuracy: 0.87, Time: 85.59 sec
Epoch: [61]/(1034/1313), Train Loss: 0.4190, Accuracy: 0.87, Time: 94.96 sec
Epoch: [61]/(1128/1313), Train Loss: 0.2842, Accuracy: 0.87, Time: 102.53 sec
Epoch: [61]/(1222/1313), Train Loss: 0.2028, Accuracy: 0.87, Time: 111.29 sec
Epoch: [61], Test Loss: 0.9653, Accuracy: 0.75, Time: 25.97 sec


Epoch: [62]/(94/1313), Train Loss: 0.2136, Accuracy: 0.88, Time: 8.50 sec
Epoch: [62]/(188/1313), Train Loss: 0.2139, Accuracy: 0.87, Time: 17.14 sec
Epoch: [62]/(282/1313), Train Loss: 0.2991, Accuracy: 0.87, Time: 25.97 sec
Epoch: [62]/(376/1313), Train Loss: 0.5643, Accuracy: 0.88, Time: 33.59 sec
Epoch: [62]/(470/1313), Train Loss: 0.1623, Accuracy: 0.88, Time: 41.43 sec
Epoch: [62]/(564/1313), Train Loss: 0.2186, Accuracy: 0.87, Time: 50.27 sec
Epoch: [62]/(658/1313), Train Loss: 0.5819, Accuracy: 0.87, Time: 59.59 sec
Epoch: [62]/(752/1313), Train Loss: 0.6538, Accuracy: 0.87, Time: 69.18 sec
Epoch: [62]/(846/1313), Train Loss: 0.5376, Accuracy: 0.87, Time: 77.40 sec
Epoch: [62]/(940/1313), Train Loss: 0.2944, Accuracy: 0.87, Time: 86.14 sec
Epoch: [62]/(1034/1313), Train Loss: 0.5062, Accuracy: 0.87, Time: 95.40 sec
Epoch: [62]/(1128/1313), Train Loss: 0.4377, Accuracy: 0.87, Time: 103.08 sec
Epoch: [62]/(1222/1313), Train Loss: 0.0725, Accuracy: 0.88, Time: 111.63 sec
Epoch: [62], Test Loss: 0.9643, Accuracy: 0.76, Time: 26.10 sec


Epoch: [63]/(94/1313), Train Loss: 0.1498, Accuracy: 0.88, Time: 8.62 sec
Epoch: [63]/(188/1313), Train Loss: 0.4940, Accuracy: 0.87, Time: 17.19 sec
Epoch: [63]/(282/1313), Train Loss: 0.2854, Accuracy: 0.88, Time: 26.05 sec
Epoch: [63]/(376/1313), Train Loss: 0.8453, Accuracy: 0.88, Time: 33.72 sec
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Epoch: [63]/(470/1313), Train Loss: 0.4715, Accuracy: 0.88, Time: 41.63 sec
Epoch: [63]/(564/1313), Train Loss: 0.0991, Accuracy: 0.88, Time: 50.18 sec
Epoch: [63]/(658/1313), Train Loss: 0.3037, Accuracy: 0.88, Time: 59.65 sec
Epoch: [63]/(752/1313), Train Loss: 0.8372, Accuracy: 0.88, Time: 69.24 sec
Epoch: [63]/(846/1313), Train Loss: 0.2829, Accuracy: 0.88, Time: 77.45 sec
Epoch: [63]/(940/1313), Train Loss: 0.2368, Accuracy: 0.88, Time: 86.20 sec
Epoch: [63]/(1034/1313), Train Loss: 0.1389, Accuracy: 0.88, Time: 95.37 sec
Epoch: [63]/(1128/1313), Train Loss: 0.1833, Accuracy: 0.88, Time: 103.13 sec
Epoch: [63]/(1222/1313), Train Loss: 0.2320, Accuracy: 0.88, Time: 111.77 sec
Epoch: [63], Test Loss: 0.9216, Accuracy: 0.75, Time: 26.06 sec


Epoch: [64]/(94/1313), Train Loss: 0.1146, Accuracy: 0.88, Time: 8.74 sec
Epoch: [64]/(188/1313), Train Loss: 0.1070, Accuracy: 0.88, Time: 17.28 sec
Epoch: [64]/(282/1313), Train Loss: 0.3397, Accuracy: 0.88, Time: 26.10 sec
Epoch: [64]/(376/1313), Train Loss: 0.2960, Accuracy: 0.88, Time: 33.62 sec
Epoch: [64]/(470/1313), Train Loss: 0.5982, Accuracy: 0.88, Time: 41.42 sec
Epoch: [64]/(564/1313), Train Loss: 0.2719, Accuracy: 0.88, Time: 50.09 sec
Epoch: [64]/(658/1313), Train Loss: 0.4772, Accuracy: 0.88, Time: 59.14 sec
Epoch: [64]/(752/1313), Train Loss: 0.5785, Accuracy: 0.88, Time: 68.81 sec
Epoch: [64]/(846/1313), Train Loss: 0.3424, Accuracy: 0.88, Time: 77.00 sec
Epoch: [64]/(940/1313), Train Loss: 0.2734, Accuracy: 0.88, Time: 85.63 sec
Epoch: [64]/(1034/1313), Train Loss: 0.2049, Accuracy: 0.88, Time: 94.90 sec
Epoch: [64]/(1128/1313), Train Loss: 0.3047, Accuracy: 0.88, Time: 102.68 sec
Epoch: [64]/(1222/1313), Train Loss: 0.1953, Accuracy: 0.88, Time: 111.19 sec
Epoch: [64], Test Loss: 0.9214, Accuracy: 0.76, Time: 26.23 sec


Epoch: [65]/(94/1313), Train Loss: 0.3238, Accuracy: 0.89, Time: 8.84 sec
Epoch: [65]/(188/1313), Train Loss: 0.1194, Accuracy: 0.88, Time: 17.55 sec
Epoch: [65]/(282/1313), Train Loss: 0.5199, Accuracy: 0.88, Time: 26.30 sec
Epoch: [65]/(376/1313), Train Loss: 0.6714, Accuracy: 0.88, Time: 33.87 sec
Epoch: [65]/(470/1313), Train Loss: 0.3185, Accuracy: 0.88, Time: 41.73 sec
Epoch: [65]/(564/1313), Train Loss: 0.1671, Accuracy: 0.88, Time: 50.57 sec
Epoch: [65]/(658/1313), Train Loss: 0.3156, Accuracy: 0.88, Time: 59.82 sec
Epoch: [65]/(752/1313), Train Loss: 0.2398, Accuracy: 0.88, Time: 69.18 sec
Epoch: [65]/(846/1313), Train Loss: 0.5011, Accuracy: 0.88, Time: 77.54 sec
Epoch: [65]/(940/1313), Train Loss: 0.3664, Accuracy: 0.88, Time: 86.09 sec
Epoch: [65]/(1034/1313), Train Loss: 0.1835, Accuracy: 0.88, Time: 95.47 sec
Epoch: [65]/(1128/1313), Train Loss: 0.1921, Accuracy: 0.88, Time: 103.16 sec
Epoch: [65]/(1222/1313), Train Loss: 0.2981, Accuracy: 0.88, Time: 111.55 sec
Epoch: [65], Test Loss: 0.9408, Accuracy: 0.75, Time: 25.79 sec


Epoch: [66]/(94/1313), Train Loss: 0.1556, Accuracy: 0.89, Time: 8.70 sec
Epoch: [66]/(188/1313), Train Loss: 0.1237, Accuracy: 0.89, Time: 17.41 sec
Epoch: [66]/(282/1313), Train Loss: 0.2084, Accuracy: 0.88, Time: 26.36 sec
Epoch: [66]/(376/1313), Train Loss: 1.0726, Accuracy: 0.89, Time: 34.06 sec
```

```
Epoch: [66]/(470/1313), Train Loss: 0.4044, Accuracy: 0.89, Time: 42.02 sec
Epoch: [66]/(564/1313), Train Loss: 0.2127, Accuracy: 0.88, Time: 50.66 sec
Epoch: [66]/(658/1313), Train Loss: 0.3538, Accuracy: 0.88, Time: 60.01 sec
Epoch: [66]/(752/1313), Train Loss: 0.6189, Accuracy: 0.88, Time: 69.61 sec
Epoch: [66]/(846/1313), Train Loss: 0.1907, Accuracy: 0.88, Time: 77.87 sec
Epoch: [66]/(940/1313), Train Loss: 0.3849, Accuracy: 0.88, Time: 86.49 sec
Epoch: [66]/(1034/1313), Train Loss: 0.2619, Accuracy: 0.88, Time: 95.90 sec
Epoch: [66]/(1128/1313), Train Loss: 0.1935, Accuracy: 0.88, Time: 103.59 sec
Epoch: [66]/(1222/1313), Train Loss: 0.3507, Accuracy: 0.88, Time: 112.19 sec
Epoch: [66], Test Loss: 0.9039, Accuracy: 0.76, Time: 25.79 sec


Epoch: [67]/(94/1313), Train Loss: 0.2515, Accuracy: 0.90, Time: 8.62 sec
Epoch: [67]/(188/1313), Train Loss: 0.4401, Accuracy: 0.89, Time: 17.26 sec
Epoch: [67]/(282/1313), Train Loss: 0.2206, Accuracy: 0.89, Time: 26.00 sec
Epoch: [67]/(376/1313), Train Loss: 0.6059, Accuracy: 0.89, Time: 33.50 sec
Epoch: [67]/(470/1313), Train Loss: 0.6311, Accuracy: 0.89, Time: 41.22 sec
Epoch: [67]/(564/1313), Train Loss: 0.1207, Accuracy: 0.89, Time: 50.06 sec
Epoch: [67]/(658/1313), Train Loss: 0.3054, Accuracy: 0.89, Time: 59.19 sec
Epoch: [67]/(752/1313), Train Loss: 0.3319, Accuracy: 0.89, Time: 68.61 sec
Epoch: [67]/(846/1313), Train Loss: 0.2124, Accuracy: 0.89, Time: 76.84 sec
Epoch: [67]/(940/1313), Train Loss: 0.0833, Accuracy: 0.89, Time: 85.39 sec
Epoch: [67]/(1034/1313), Train Loss: 0.1404, Accuracy: 0.89, Time: 94.66 sec
Epoch: [67]/(1128/1313), Train Loss: 0.4210, Accuracy: 0.89, Time: 102.17 sec
Epoch: [67]/(1222/1313), Train Loss: 0.2395, Accuracy: 0.89, Time: 110.63 sec
Epoch: [67], Test Loss: 1.0267, Accuracy: 0.75, Time: 26.19 sec


Epoch: [68]/(94/1313), Train Loss: 0.2540, Accuracy: 0.89, Time: 8.64 sec
Epoch: [68]/(188/1313), Train Loss: 0.3396, Accuracy: 0.89, Time: 17.40 sec
Epoch: [68]/(282/1313), Train Loss: 0.1573, Accuracy: 0.89, Time: 26.28 sec
Epoch: [68]/(376/1313), Train Loss: 1.0484, Accuracy: 0.89, Time: 33.73 sec
Epoch: [68]/(470/1313), Train Loss: 0.0487, Accuracy: 0.89, Time: 41.57 sec
Epoch: [68]/(564/1313), Train Loss: 0.1321, Accuracy: 0.88, Time: 50.33 sec
Epoch: [68]/(658/1313), Train Loss: 0.7496, Accuracy: 0.88, Time: 59.71 sec
Epoch: [68]/(752/1313), Train Loss: 0.3639, Accuracy: 0.88, Time: 69.33 sec
Epoch: [68]/(846/1313), Train Loss: 0.2430, Accuracy: 0.88, Time: 77.60 sec
Epoch: [68]/(940/1313), Train Loss: 0.4163, Accuracy: 0.88, Time: 86.17 sec
Epoch: [68]/(1034/1313), Train Loss: 0.5816, Accuracy: 0.89, Time: 95.63 sec
Epoch: [68]/(1128/1313), Train Loss: 0.1221, Accuracy: 0.89, Time: 103.22 sec
Epoch: [68]/(1222/1313), Train Loss: 0.2850, Accuracy: 0.88, Time: 111.78 sec
Epoch: [68], Test Loss: 0.9550, Accuracy: 0.76, Time: 26.01 sec


Epoch: [69]/(94/1313), Train Loss: 0.2044, Accuracy: 0.89, Time: 8.67 sec
Epoch: [69]/(188/1313), Train Loss: 0.1325, Accuracy: 0.88, Time: 16.94 sec
Epoch: [69]/(282/1313), Train Loss: 0.3145, Accuracy: 0.88, Time: 25.81 sec
Epoch: [69]/(376/1313), Train Loss: 0.7143, Accuracy: 0.89, Time: 33.18 sec
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Epoch: [69]/(470/1313), Train Loss: 0.1851, Accuracy: 0.89, Time: 41.13 sec
Epoch: [69]/(564/1313), Train Loss: 0.2081, Accuracy: 0.89, Time: 49.83 sec
Epoch: [69]/(658/1313), Train Loss: 0.2914, Accuracy: 0.89, Time: 59.12 sec
Epoch: [69]/(752/1313), Train Loss: 0.5843, Accuracy: 0.89, Time: 68.77 sec
Epoch: [69]/(846/1313), Train Loss: 0.3039, Accuracy: 0.89, Time: 77.31 sec
Epoch: [69]/(940/1313), Train Loss: 0.0902, Accuracy: 0.89, Time: 86.03 sec
Epoch: [69]/(1034/1313), Train Loss: 0.1192, Accuracy: 0.89, Time: 95.32 sec
Epoch: [69]/(1128/1313), Train Loss: 0.1054, Accuracy: 0.89, Time: 102.92 sec
Epoch: [69]/(1222/1313), Train Loss: 0.3798, Accuracy: 0.89, Time: 111.53 sec
Epoch: [69], Test Loss: 0.9796, Accuracy: 0.75, Time: 25.78 sec


Epoch: [70]/(94/1313), Train Loss: 0.1382, Accuracy: 0.89, Time: 8.88 sec
Epoch: [70]/(188/1313), Train Loss: 0.1954, Accuracy: 0.89, Time: 17.61 sec
Epoch: [70]/(282/1313), Train Loss: 0.2555, Accuracy: 0.89, Time: 26.15 sec
Epoch: [70]/(376/1313), Train Loss: 0.5701, Accuracy: 0.89, Time: 33.68 sec
Epoch: [70]/(470/1313), Train Loss: 0.2535, Accuracy: 0.89, Time: 41.39 sec
Epoch: [70]/(564/1313), Train Loss: 0.3467, Accuracy: 0.89, Time: 50.08 sec
Epoch: [70]/(658/1313), Train Loss: 0.2698, Accuracy: 0.89, Time: 59.06 sec
Epoch: [70]/(752/1313), Train Loss: 0.5574, Accuracy: 0.89, Time: 68.60 sec
Epoch: [70]/(846/1313), Train Loss: 0.0818, Accuracy: 0.89, Time: 76.78 sec
Epoch: [70]/(940/1313), Train Loss: 0.2919, Accuracy: 0.89, Time: 85.53 sec
Epoch: [70]/(1034/1313), Train Loss: 0.1065, Accuracy: 0.89, Time: 94.82 sec
Epoch: [70]/(1128/1313), Train Loss: 0.5272, Accuracy: 0.89, Time: 102.61 sec
Epoch: [70]/(1222/1313), Train Loss: 0.4849, Accuracy: 0.89, Time: 110.99 sec
Epoch: [70], Test Loss: 1.0161, Accuracy: 0.75, Time: 26.06 sec


Epoch: [71]/(94/1313), Train Loss: 0.0586, Accuracy: 0.91, Time: 8.61 sec
Epoch: [71]/(188/1313), Train Loss: 0.1784, Accuracy: 0.90, Time: 17.08 sec
Epoch: [71]/(282/1313), Train Loss: 0.2925, Accuracy: 0.90, Time: 25.64 sec
Epoch: [71]/(376/1313), Train Loss: 0.5007, Accuracy: 0.90, Time: 32.95 sec
Epoch: [71]/(470/1313), Train Loss: 0.2356, Accuracy: 0.90, Time: 40.62 sec
Epoch: [71]/(564/1313), Train Loss: 0.1032, Accuracy: 0.90, Time: 49.18 sec
Epoch: [71]/(658/1313), Train Loss: 0.7917, Accuracy: 0.90, Time: 58.30 sec
Epoch: [71]/(752/1313), Train Loss: 0.5702, Accuracy: 0.90, Time: 67.99 sec
Epoch: [71]/(846/1313), Train Loss: 0.1888, Accuracy: 0.90, Time: 76.26 sec
Epoch: [71]/(940/1313), Train Loss: 0.2206, Accuracy: 0.90, Time: 84.70 sec
Epoch: [71]/(1034/1313), Train Loss: 0.2099, Accuracy: 0.90, Time: 93.88 sec
Epoch: [71]/(1128/1313), Train Loss: 0.0497, Accuracy: 0.90, Time: 101.64 sec
Epoch: [71]/(1222/1313), Train Loss: 0.2323, Accuracy: 0.90, Time: 110.15 sec
Epoch: [71], Test Loss: 1.0311, Accuracy: 0.75, Time: 26.17 sec


Epoch: [72]/(94/1313), Train Loss: 0.2376, Accuracy: 0.90, Time: 8.59 sec
Epoch: [72]/(188/1313), Train Loss: 0.1652, Accuracy: 0.89, Time: 17.29 sec
Epoch: [72]/(282/1313), Train Loss: 0.6294, Accuracy: 0.89, Time: 26.03 sec
Epoch: [72]/(376/1313), Train Loss: 0.4379, Accuracy: 0.90, Time: 33.54 sec
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Epoch: [72]/(470/1313), Train Loss: 0.3653, Accuracy: 0.90, Time: 41.38 sec
Epoch: [72]/(564/1313), Train Loss: 0.0655, Accuracy: 0.89, Time: 50.03 sec
Epoch: [72]/(658/1313), Train Loss: 0.7899, Accuracy: 0.89, Time: 58.91 sec
Epoch: [72]/(752/1313), Train Loss: 0.8637, Accuracy: 0.89, Time: 68.44 sec
Epoch: [72]/(846/1313), Train Loss: 0.2561, Accuracy: 0.89, Time: 76.83 sec
Epoch: [72]/(940/1313), Train Loss: 0.2620, Accuracy: 0.89, Time: 85.54 sec
Epoch: [72]/(1034/1313), Train Loss: 0.5084, Accuracy: 0.89, Time: 94.82 sec
Epoch: [72]/(1128/1313), Train Loss: 0.2340, Accuracy: 0.90, Time: 102.34 sec
Epoch: [72]/(1222/1313), Train Loss: 0.1940, Accuracy: 0.90, Time: 110.90 sec
Epoch: [72], Test Loss: 0.9421, Accuracy: 0.78, Time: 25.74 sec


Epoch: [73]/(94/1313), Train Loss: 0.2025, Accuracy: 0.91, Time: 8.77 sec
Epoch: [73]/(188/1313), Train Loss: 0.2000, Accuracy: 0.90, Time: 17.37 sec
Epoch: [73]/(282/1313), Train Loss: 0.5706, Accuracy: 0.90, Time: 26.12 sec
Epoch: [73]/(376/1313), Train Loss: 0.5877, Accuracy: 0.90, Time: 33.81 sec
Epoch: [73]/(470/1313), Train Loss: 0.1836, Accuracy: 0.90, Time: 41.63 sec
Epoch: [73]/(564/1313), Train Loss: 0.3699, Accuracy: 0.90, Time: 50.23 sec
Epoch: [73]/(658/1313), Train Loss: 0.2483, Accuracy: 0.90, Time: 59.48 sec
Epoch: [73]/(752/1313), Train Loss: 0.7626, Accuracy: 0.90, Time: 69.05 sec
Epoch: [73]/(846/1313), Train Loss: 0.0707, Accuracy: 0.90, Time: 77.18 sec
Epoch: [73]/(940/1313), Train Loss: 0.1067, Accuracy: 0.90, Time: 85.86 sec
Epoch: [73]/(1034/1313), Train Loss: 0.2211, Accuracy: 0.90, Time: 95.15 sec
Epoch: [73]/(1128/1313), Train Loss: 0.1019, Accuracy: 0.90, Time: 102.73 sec
Epoch: [73]/(1222/1313), Train Loss: 0.2430, Accuracy: 0.90, Time: 111.25 sec
Epoch: [73], Test Loss: 1.0770, Accuracy: 0.74, Time: 26.31 sec


Epoch: [74]/(94/1313), Train Loss: 0.1081, Accuracy: 0.90, Time: 8.73 sec
Epoch: [74]/(188/1313), Train Loss: 0.1299, Accuracy: 0.90, Time: 17.29 sec
Epoch: [74]/(282/1313), Train Loss: 0.3623, Accuracy: 0.90, Time: 26.19 sec
Epoch: [74]/(376/1313), Train Loss: 0.5184, Accuracy: 0.90, Time: 33.74 sec
Epoch: [74]/(470/1313), Train Loss: 0.0365, Accuracy: 0.90, Time: 41.67 sec
Epoch: [74]/(564/1313), Train Loss: 0.0984, Accuracy: 0.90, Time: 50.51 sec
Epoch: [74]/(658/1313), Train Loss: 0.2916, Accuracy: 0.90, Time: 59.76 sec
Epoch: [74]/(752/1313), Train Loss: 0.5605, Accuracy: 0.90, Time: 69.25 sec
Epoch: [74]/(846/1313), Train Loss: 0.3630, Accuracy: 0.90, Time: 77.51 sec
Epoch: [74]/(940/1313), Train Loss: 0.2880, Accuracy: 0.90, Time: 86.26 sec
Epoch: [74]/(1034/1313), Train Loss: 0.1873, Accuracy: 0.90, Time: 95.59 sec
Epoch: [74]/(1128/1313), Train Loss: 0.3475, Accuracy: 0.90, Time: 103.15 sec
Epoch: [74]/(1222/1313), Train Loss: 0.2712, Accuracy: 0.90, Time: 111.64 sec
Epoch: [74], Test Loss: 0.9593, Accuracy: 0.76, Time: 26.18 sec


Epoch: [75]/(94/1313), Train Loss: 0.1305, Accuracy: 0.90, Time: 8.67 sec
Epoch: [75]/(188/1313), Train Loss: 0.0628, Accuracy: 0.89, Time: 17.26 sec
Epoch: [75]/(282/1313), Train Loss: 0.2675, Accuracy: 0.90, Time: 25.93 sec
Epoch: [75]/(376/1313), Train Loss: 0.3162, Accuracy: 0.90, Time: 33.34 sec
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Epoch: [75]/(470/1313), Train Loss: 0.1053, Accuracy: 0.90, Time: 41.01 sec
Epoch: [75]/(564/1313), Train Loss: 0.0731, Accuracy: 0.90, Time: 49.60 sec
Epoch: [75]/(658/1313), Train Loss: 0.3997, Accuracy: 0.90, Time: 58.46 sec
Epoch: [75]/(752/1313), Train Loss: 0.3840, Accuracy: 0.90, Time: 67.85 sec
Epoch: [75]/(846/1313), Train Loss: 0.2361, Accuracy: 0.90, Time: 76.08 sec
Epoch: [75]/(940/1313), Train Loss: 0.1828, Accuracy: 0.90, Time: 84.76 sec
Epoch: [75]/(1034/1313), Train Loss: 0.1878, Accuracy: 0.90, Time: 94.07 sec
Epoch: [75]/(1128/1313), Train Loss: 0.2295, Accuracy: 0.90, Time: 101.96 sec
Epoch: [75]/(1222/1313), Train Loss: 0.2010, Accuracy: 0.90, Time: 110.46 sec
Epoch: [75], Test Loss: 0.9011, Accuracy: 0.77, Time: 26.03 sec


Epoch: [76]/(94/1313), Train Loss: 0.0517, Accuracy: 0.91, Time: 8.74 sec
Epoch: [76]/(188/1313), Train Loss: 0.1310, Accuracy: 0.90, Time: 17.38 sec
Epoch: [76]/(282/1313), Train Loss: 0.3080, Accuracy: 0.90, Time: 26.10 sec
Epoch: [76]/(376/1313), Train Loss: 0.4288, Accuracy: 0.90, Time: 33.77 sec
Epoch: [76]/(470/1313), Train Loss: 0.0743, Accuracy: 0.90, Time: 41.82 sec
Epoch: [76]/(564/1313), Train Loss: 0.2932, Accuracy: 0.90, Time: 50.55 sec
Epoch: [76]/(658/1313), Train Loss: 0.6364, Accuracy: 0.90, Time: 59.69 sec
Epoch: [76]/(752/1313), Train Loss: 0.1951, Accuracy: 0.90, Time: 69.37 sec
Epoch: [76]/(846/1313), Train Loss: 0.2916, Accuracy: 0.90, Time: 77.74 sec
Epoch: [76]/(940/1313), Train Loss: 0.3149, Accuracy: 0.90, Time: 86.51 sec
Epoch: [76]/(1034/1313), Train Loss: 0.6860, Accuracy: 0.90, Time: 95.86 sec
Epoch: [76]/(1128/1313), Train Loss: 0.1130, Accuracy: 0.90, Time: 103.49 sec
Epoch: [76]/(1222/1313), Train Loss: 0.0964, Accuracy: 0.90, Time: 111.96 sec
Epoch: [76], Test Loss: 0.9590, Accuracy: 0.77, Time: 25.99 sec


Epoch: [77]/(94/1313), Train Loss: 0.1066, Accuracy: 0.91, Time: 8.76 sec
Epoch: [77]/(188/1313), Train Loss: 0.4386, Accuracy: 0.90, Time: 17.34 sec
Epoch: [77]/(282/1313), Train Loss: 0.2386, Accuracy: 0.90, Time: 26.08 sec
Epoch: [77]/(376/1313), Train Loss: 0.8275, Accuracy: 0.90, Time: 33.78 sec
Epoch: [77]/(470/1313), Train Loss: 0.1281, Accuracy: 0.90, Time: 41.82 sec
Epoch: [77]/(564/1313), Train Loss: 0.0537, Accuracy: 0.90, Time: 50.66 sec
Epoch: [77]/(658/1313), Train Loss: 0.3168, Accuracy: 0.90, Time: 59.98 sec
Epoch: [77]/(752/1313), Train Loss: 0.2177, Accuracy: 0.90, Time: 69.54 sec
Epoch: [77]/(846/1313), Train Loss: 0.3246, Accuracy: 0.90, Time: 77.75 sec
Epoch: [77]/(940/1313), Train Loss: 0.4936, Accuracy: 0.90, Time: 86.42 sec
Epoch: [77]/(1034/1313), Train Loss: 0.1943, Accuracy: 0.90, Time: 95.60 sec
Epoch: [77]/(1128/1313), Train Loss: 0.0774, Accuracy: 0.90, Time: 103.33 sec
Epoch: [77]/(1222/1313), Train Loss: 0.0948, Accuracy: 0.90, Time: 111.82 sec
Epoch: [77], Test Loss: 1.0870, Accuracy: 0.75, Time: 26.33 sec


Epoch: [78]/(94/1313), Train Loss: 0.3541, Accuracy: 0.91, Time: 8.72 sec
Epoch: [78]/(188/1313), Train Loss: 0.1689, Accuracy: 0.91, Time: 17.24 sec
Epoch: [78]/(282/1313), Train Loss: 0.2047, Accuracy: 0.91, Time: 26.06 sec
Epoch: [78]/(376/1313), Train Loss: 0.3479, Accuracy: 0.91, Time: 33.63 sec
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Epoch: [78]/(470/1313), Train Loss: 0.1111, Accuracy: 0.90, Time: 41.30 sec
Epoch: [78]/(564/1313), Train Loss: 0.1642, Accuracy: 0.90, Time: 50.08 sec
Epoch: [78]/(658/1313), Train Loss: 0.6103, Accuracy: 0.90, Time: 59.13 sec
Epoch: [78]/(752/1313), Train Loss: 0.8256, Accuracy: 0.90, Time: 68.74 sec
Epoch: [78]/(846/1313), Train Loss: 0.3314, Accuracy: 0.90, Time: 77.11 sec
Epoch: [78]/(940/1313), Train Loss: 0.1354, Accuracy: 0.90, Time: 85.82 sec
Epoch: [78]/(1034/1313), Train Loss: 0.2157, Accuracy: 0.90, Time: 95.07 sec
Epoch: [78]/(1128/1313), Train Loss: 0.6389, Accuracy: 0.90, Time: 102.72 sec
Epoch: [78]/(1222/1313), Train Loss: 0.2810, Accuracy: 0.90, Time: 111.13 sec
Epoch: [78], Test Loss: 0.9205, Accuracy: 0.77, Time: 26.02 sec


Epoch: [79]/(94/1313), Train Loss: 0.1958, Accuracy: 0.91, Time: 8.69 sec
Epoch: [79]/(188/1313), Train Loss: 0.4907, Accuracy: 0.90, Time: 17.40 sec
Epoch: [79]/(282/1313), Train Loss: 0.3128, Accuracy: 0.90, Time: 26.17 sec
Epoch: [79]/(376/1313), Train Loss: 0.2479, Accuracy: 0.90, Time: 33.64 sec
Epoch: [79]/(470/1313), Train Loss: 0.2408, Accuracy: 0.91, Time: 41.48 sec
Epoch: [79]/(564/1313), Train Loss: 0.2323, Accuracy: 0.90, Time: 50.13 sec
Epoch: [79]/(658/1313), Train Loss: 0.1268, Accuracy: 0.90, Time: 59.19 sec
Epoch: [79]/(752/1313), Train Loss: 0.4277, Accuracy: 0.90, Time: 68.62 sec
Epoch: [79]/(846/1313), Train Loss: 0.0604, Accuracy: 0.90, Time: 76.88 sec
Epoch: [79]/(940/1313), Train Loss: 0.3216, Accuracy: 0.90, Time: 85.65 sec
Epoch: [79]/(1034/1313), Train Loss: 0.2985, Accuracy: 0.90, Time: 95.03 sec
Epoch: [79]/(1128/1313), Train Loss: 0.1622, Accuracy: 0.90, Time: 102.78 sec
Epoch: [79]/(1222/1313), Train Loss: 0.0786, Accuracy: 0.90, Time: 111.31 sec
Epoch: [79], Test Loss: 0.9606, Accuracy: 0.77, Time: 26.10 sec


Epoch: [80]/(94/1313), Train Loss: 0.1531, Accuracy: 0.92, Time: 8.66 sec
Epoch: [80]/(188/1313), Train Loss: 0.2077, Accuracy: 0.91, Time: 17.30 sec
Epoch: [80]/(282/1313), Train Loss: 0.2240, Accuracy: 0.91, Time: 26.32 sec
Epoch: [80]/(376/1313), Train Loss: 0.4029, Accuracy: 0.91, Time: 33.85 sec
Epoch: [80]/(470/1313), Train Loss: 0.3668, Accuracy: 0.91, Time: 41.62 sec
Epoch: [80]/(564/1313), Train Loss: 0.1414, Accuracy: 0.91, Time: 50.43 sec
Epoch: [80]/(658/1313), Train Loss: 0.2645, Accuracy: 0.91, Time: 59.57 sec
Epoch: [80]/(752/1313), Train Loss: 0.3715, Accuracy: 0.91, Time: 69.10 sec
Epoch: [80]/(846/1313), Train Loss: 0.1782, Accuracy: 0.91, Time: 77.40 sec
Epoch: [80]/(940/1313), Train Loss: 0.2554, Accuracy: 0.91, Time: 86.02 sec
Epoch: [80]/(1034/1313), Train Loss: 0.1273, Accuracy: 0.91, Time: 95.40 sec
Epoch: [80]/(1128/1313), Train Loss: 0.2813, Accuracy: 0.91, Time: 103.19 sec
Epoch: [80]/(1222/1313), Train Loss: 0.8330, Accuracy: 0.91, Time: 111.68 sec
Epoch: [80], Test Loss: 0.9875, Accuracy: 0.77, Time: 25.56 sec


Epoch: [81]/(94/1313), Train Loss: 0.1166, Accuracy: 0.92, Time: 8.54 sec
Epoch: [81]/(188/1313), Train Loss: 0.1293, Accuracy: 0.91, Time: 17.03 sec
Epoch: [81]/(282/1313), Train Loss: 0.4024, Accuracy: 0.91, Time: 25.81 sec
Epoch: [81]/(376/1313), Train Loss: 0.4372, Accuracy: 0.91, Time: 33.41 sec
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Epoch: [81]/(470/1313), Train Loss: 0.1770, Accuracy: 0.91, Time: 41.15 sec
Epoch: [81]/(564/1313), Train Loss: 0.2132, Accuracy: 0.91, Time: 49.73 sec
Epoch: [81]/(658/1313), Train Loss: 0.1730, Accuracy: 0.91, Time: 58.95 sec
Epoch: [81]/(752/1313), Train Loss: 0.1542, Accuracy: 0.91, Time: 68.28 sec
Epoch: [81]/(846/1313), Train Loss: 0.1051, Accuracy: 0.91, Time: 76.68 sec
Epoch: [81]/(940/1313), Train Loss: 0.0766, Accuracy: 0.91, Time: 85.10 sec
Epoch: [81]/(1034/1313), Train Loss: 0.2396, Accuracy: 0.91, Time: 94.32 sec
Epoch: [81]/(1128/1313), Train Loss: 0.0141, Accuracy: 0.91, Time: 101.81 sec
Epoch: [81]/(1222/1313), Train Loss: 0.3630, Accuracy: 0.91, Time: 110.40 sec
Epoch: [81], Test Loss: 0.9534, Accuracy: 0.77, Time: 25.73 sec


Epoch: [82]/(94/1313), Train Loss: 0.0445, Accuracy: 0.91, Time: 8.69 sec
Epoch: [82]/(188/1313), Train Loss: 0.1001, Accuracy: 0.91, Time: 17.29 sec
Epoch: [82]/(282/1313), Train Loss: 0.4898, Accuracy: 0.91, Time: 26.19 sec
Epoch: [82]/(376/1313), Train Loss: 0.4265, Accuracy: 0.91, Time: 33.71 sec
Epoch: [82]/(470/1313), Train Loss: 0.7978, Accuracy: 0.91, Time: 41.53 sec
Epoch: [82]/(564/1313), Train Loss: 0.2186, Accuracy: 0.91, Time: 50.24 sec
Epoch: [82]/(658/1313), Train Loss: 0.3904, Accuracy: 0.91, Time: 59.30 sec
Epoch: [82]/(752/1313), Train Loss: 0.9373, Accuracy: 0.90, Time: 68.89 sec
Epoch: [82]/(846/1313), Train Loss: 0.0960, Accuracy: 0.91, Time: 77.03 sec
Epoch: [82]/(940/1313), Train Loss: 0.1037, Accuracy: 0.91, Time: 85.67 sec
Epoch: [82]/(1034/1313), Train Loss: 0.3001, Accuracy: 0.91, Time: 94.87 sec
Epoch: [82]/(1128/1313), Train Loss: 0.1944, Accuracy: 0.91, Time: 102.49 sec
Epoch: [82]/(1222/1313), Train Loss: 0.1692, Accuracy: 0.91, Time: 111.08 sec
Epoch: [82], Test Loss: 1.0315, Accuracy: 0.75, Time: 26.29 sec


Epoch: [83]/(94/1313), Train Loss: 0.0589, Accuracy: 0.93, Time: 8.69 sec
Epoch: [83]/(188/1313), Train Loss: 0.0828, Accuracy: 0.91, Time: 17.23 sec
Epoch: [83]/(282/1313), Train Loss: 0.1134, Accuracy: 0.92, Time: 25.81 sec
Epoch: [83]/(376/1313), Train Loss: 0.5203, Accuracy: 0.92, Time: 33.43 sec
Epoch: [83]/(470/1313), Train Loss: 0.1879, Accuracy: 0.91, Time: 41.32 sec
Epoch: [83]/(564/1313), Train Loss: 0.2953, Accuracy: 0.91, Time: 49.89 sec
Epoch: [83]/(658/1313), Train Loss: 0.2161, Accuracy: 0.91, Time: 58.99 sec
Epoch: [83]/(752/1313), Train Loss: 0.2281, Accuracy: 0.91, Time: 68.73 sec
Epoch: [83]/(846/1313), Train Loss: 0.0590, Accuracy: 0.91, Time: 77.06 sec
Epoch: [83]/(940/1313), Train Loss: 0.0926, Accuracy: 0.91, Time: 85.66 sec
Epoch: [83]/(1034/1313), Train Loss: 0.0874, Accuracy: 0.91, Time: 94.81 sec
Epoch: [83]/(1128/1313), Train Loss: 0.1440, Accuracy: 0.91, Time: 102.51 sec
Epoch: [83]/(1222/1313), Train Loss: 0.2023, Accuracy: 0.91, Time: 110.94 sec
Epoch: [83], Test Loss: 0.9942, Accuracy: 0.77, Time: 26.10 sec


Epoch: [84]/(94/1313), Train Loss: 0.1515, Accuracy: 0.91, Time: 8.77 sec
Epoch: [84]/(188/1313), Train Loss: 0.1213, Accuracy: 0.91, Time: 17.51 sec
Epoch: [84]/(282/1313), Train Loss: 0.4521, Accuracy: 0.91, Time: 26.16 sec
Epoch: [84]/(376/1313), Train Loss: 0.4101, Accuracy: 0.91, Time: 33.89 sec
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Epoch: [84]/(470/1313), Train Loss: 0.2194, Accuracy: 0.91, Time: 41.85 sec
Epoch: [84]/(564/1313), Train Loss: 0.0666, Accuracy: 0.91, Time: 50.71 sec
Epoch: [84]/(658/1313), Train Loss: 0.1710, Accuracy: 0.91, Time: 59.88 sec
Epoch: [84]/(752/1313), Train Loss: 0.3627, Accuracy: 0.91, Time: 69.43 sec
Epoch: [84]/(846/1313), Train Loss: 0.6849, Accuracy: 0.91, Time: 77.67 sec
Epoch: [84]/(940/1313), Train Loss: 0.0938, Accuracy: 0.91, Time: 86.34 sec
Epoch: [84]/(1034/1313), Train Loss: 0.2775, Accuracy: 0.91, Time: 95.52 sec
Epoch: [84]/(1128/1313), Train Loss: 0.2975, Accuracy: 0.91, Time: 103.13 sec
Epoch: [84]/(1222/1313), Train Loss: 0.1430, Accuracy: 0.91, Time: 111.57 sec
Epoch: [84], Test Loss: 1.0852, Accuracy: 0.76, Time: 25.71 sec


Epoch: [85]/(94/1313), Train Loss: 0.1037, Accuracy: 0.92, Time: 8.62 sec
Epoch: [85]/(188/1313), Train Loss: 0.2426, Accuracy: 0.92, Time: 17.09 sec
Epoch: [85]/(282/1313), Train Loss: 0.2024, Accuracy: 0.92, Time: 26.09 sec
Epoch: [85]/(376/1313), Train Loss: 0.6159, Accuracy: 0.91, Time: 33.60 sec
Epoch: [85]/(470/1313), Train Loss: 0.0607, Accuracy: 0.91, Time: 41.63 sec
Epoch: [85]/(564/1313), Train Loss: 0.0992, Accuracy: 0.91, Time: 50.28 sec
Epoch: [85]/(658/1313), Train Loss: 0.1855, Accuracy: 0.91, Time: 59.51 sec
Epoch: [85]/(752/1313), Train Loss: 0.2779, Accuracy: 0.91, Time: 69.10 sec
Epoch: [85]/(846/1313), Train Loss: 0.1684, Accuracy: 0.91, Time: 77.43 sec
Epoch: [85]/(940/1313), Train Loss: 0.2042, Accuracy: 0.91, Time: 86.03 sec
Epoch: [85]/(1034/1313), Train Loss: 0.3270, Accuracy: 0.91, Time: 95.22 sec
Epoch: [85]/(1128/1313), Train Loss: 0.0539, Accuracy: 0.91, Time: 102.92 sec
Epoch: [85]/(1222/1313), Train Loss: 0.4353, Accuracy: 0.91, Time: 111.36 sec
Epoch: [85], Test Loss: 0.9547, Accuracy: 0.76, Time: 25.57 sec


Epoch: [86]/(94/1313), Train Loss: 0.0594, Accuracy: 0.92, Time: 8.68 sec
Epoch: [86]/(188/1313), Train Loss: 0.3434, Accuracy: 0.92, Time: 17.30 sec
Epoch: [86]/(282/1313), Train Loss: 0.2378, Accuracy: 0.92, Time: 25.91 sec
Epoch: [86]/(376/1313), Train Loss: 0.3476, Accuracy: 0.92, Time: 33.56 sec
Epoch: [86]/(470/1313), Train Loss: 0.2684, Accuracy: 0.92, Time: 41.20 sec
Epoch: [86]/(564/1313), Train Loss: 0.0441, Accuracy: 0.92, Time: 49.94 sec
Epoch: [86]/(658/1313), Train Loss: 0.1978, Accuracy: 0.92, Time: 59.09 sec
Epoch: [86]/(752/1313), Train Loss: 0.6344, Accuracy: 0.92, Time: 68.56 sec
Epoch: [86]/(846/1313), Train Loss: 0.1581, Accuracy: 0.92, Time: 76.82 sec
Epoch: [86]/(940/1313), Train Loss: 0.1394, Accuracy: 0.92, Time: 85.35 sec
Epoch: [86]/(1034/1313), Train Loss: 0.4836, Accuracy: 0.92, Time: 94.72 sec
Epoch: [86]/(1128/1313), Train Loss: 0.0456, Accuracy: 0.92, Time: 102.26 sec
Epoch: [86]/(1222/1313), Train Loss: 0.3464, Accuracy: 0.92, Time: 110.79 sec
Epoch: [86], Test Loss: 1.0032, Accuracy: 0.76, Time: 25.61 sec


Epoch: [87]/(94/1313), Train Loss: 0.0290, Accuracy: 0.92, Time: 8.71 sec
Epoch: [87]/(188/1313), Train Loss: 0.3260, Accuracy: 0.91, Time: 17.27 sec
Epoch: [87]/(282/1313), Train Loss: 0.1386, Accuracy: 0.91, Time: 25.94 sec
Epoch: [87]/(376/1313), Train Loss: 0.2989, Accuracy: 0.91, Time: 33.69 sec
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Epoch: [87]/(470/1313), Train Loss: 0.1026, Accuracy: 0.91, Time: 41.49 sec
Epoch: [87]/(564/1313), Train Loss: 0.1603, Accuracy: 0.91, Time: 50.23 sec
Epoch: [87]/(658/1313), Train Loss: 0.0941, Accuracy: 0.91, Time: 59.40 sec
Epoch: [87]/(752/1313), Train Loss: 0.9352, Accuracy: 0.91, Time: 68.90 sec
Epoch: [87]/(846/1313), Train Loss: 0.2021, Accuracy: 0.91, Time: 77.08 sec
Epoch: [87]/(940/1313), Train Loss: 0.3348, Accuracy: 0.92, Time: 85.69 sec
Epoch: [87]/(1034/1313), Train Loss: 0.1734, Accuracy: 0.92, Time: 95.00 sec
Epoch: [87]/(1128/1313), Train Loss: 0.2879, Accuracy: 0.92, Time: 102.51 sec
Epoch: [87]/(1222/1313), Train Loss: 0.2804, Accuracy: 0.92, Time: 111.04 sec
Epoch: [87], Test Loss: 0.9821, Accuracy: 0.77, Time: 25.74 sec


Epoch: [88]/(94/1313), Train Loss: 0.1471, Accuracy: 0.92, Time: 8.75 sec
Epoch: [88]/(188/1313), Train Loss: 0.1653, Accuracy: 0.91, Time: 17.40 sec
Epoch: [88]/(282/1313), Train Loss: 0.1459, Accuracy: 0.91, Time: 26.12 sec
Epoch: [88]/(376/1313), Train Loss: 0.8089, Accuracy: 0.92, Time: 33.60 sec
Epoch: [88]/(470/1313), Train Loss: 0.1514, Accuracy: 0.91, Time: 41.38 sec
Epoch: [88]/(564/1313), Train Loss: 0.0968, Accuracy: 0.91, Time: 50.06 sec
Epoch: [88]/(658/1313), Train Loss: 0.1209, Accuracy: 0.92, Time: 59.07 sec
Epoch: [88]/(752/1313), Train Loss: 0.5432, Accuracy: 0.92, Time: 68.70 sec
Epoch: [88]/(846/1313), Train Loss: 0.1214, Accuracy: 0.92, Time: 77.13 sec
Epoch: [88]/(940/1313), Train Loss: 0.0975, Accuracy: 0.92, Time: 86.06 sec
Epoch: [88]/(1034/1313), Train Loss: 0.1440, Accuracy: 0.92, Time: 95.42 sec
Epoch: [88]/(1128/1313), Train Loss: 0.1071, Accuracy: 0.92, Time: 103.14 sec
Epoch: [88]/(1222/1313), Train Loss: 0.1974, Accuracy: 0.92, Time: 111.72 sec
Epoch: [88], Test Loss: 1.0150, Accuracy: 0.77, Time: 26.09 sec


Epoch: [89]/(94/1313), Train Loss: 0.1392, Accuracy: 0.92, Time: 8.74 sec
Epoch: [89]/(188/1313), Train Loss: 0.1527, Accuracy: 0.91, Time: 17.31 sec
Epoch: [89]/(282/1313), Train Loss: 0.1632, Accuracy: 0.91, Time: 26.05 sec
Epoch: [89]/(376/1313), Train Loss: 0.4432, Accuracy: 0.91, Time: 33.75 sec
Epoch: [89]/(470/1313), Train Loss: 0.0586, Accuracy: 0.92, Time: 41.74 sec
Epoch: [89]/(564/1313), Train Loss: 0.0579, Accuracy: 0.92, Time: 50.39 sec
Epoch: [89]/(658/1313), Train Loss: 0.3212, Accuracy: 0.92, Time: 59.56 sec
Epoch: [89]/(752/1313), Train Loss: 0.2848, Accuracy: 0.92, Time: 69.08 sec
Epoch: [89]/(846/1313), Train Loss: 0.2164, Accuracy: 0.92, Time: 77.38 sec
Epoch: [89]/(940/1313), Train Loss: 0.1055, Accuracy: 0.92, Time: 86.15 sec
Epoch: [89]/(1034/1313), Train Loss: 0.4078, Accuracy: 0.92, Time: 95.35 sec
Epoch: [89]/(1128/1313), Train Loss: 0.1171, Accuracy: 0.92, Time: 103.04 sec
Epoch: [89]/(1222/1313), Train Loss: 0.4004, Accuracy: 0.92, Time: 111.63 sec
Epoch: [89], Test Loss: 0.9346, Accuracy: 0.77, Time: 25.91 sec


Epoch: [90]/(94/1313), Train Loss: 0.0404, Accuracy: 0.93, Time: 8.66 sec
Epoch: [90]/(188/1313), Train Loss: 0.1562, Accuracy: 0.92, Time: 17.40 sec
Epoch: [90]/(282/1313), Train Loss: 0.3732, Accuracy: 0.92, Time: 26.43 sec
Epoch: [90]/(376/1313), Train Loss: 0.2505, Accuracy: 0.92, Time: 34.02 sec
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Epoch: [90]/(470/1313), Train Loss: 0.2482, Accuracy: 0.93, Time: 41.94 sec
Epoch: [90]/(564/1313), Train Loss: 0.2587, Accuracy: 0.92, Time: 50.38 sec
Epoch: [90]/(658/1313), Train Loss: 0.2877, Accuracy: 0.92, Time: 59.55 sec
Epoch: [90]/(752/1313), Train Loss: 0.1493, Accuracy: 0.92, Time: 68.90 sec
Epoch: [90]/(846/1313), Train Loss: 0.1623, Accuracy: 0.92, Time: 77.07 sec
Epoch: [90]/(940/1313), Train Loss: 0.1092, Accuracy: 0.92, Time: 85.68 sec
Epoch: [90]/(1034/1313), Train Loss: 0.2691, Accuracy: 0.92, Time: 94.96 sec
Epoch: [90]/(1128/1313), Train Loss: 0.1252, Accuracy: 0.92, Time: 102.76 sec
Epoch: [90]/(1222/1313), Train Loss: 0.0856, Accuracy: 0.92, Time: 111.35 sec
Epoch: [90], Test Loss: 1.0264, Accuracy: 0.76, Time: 26.16 sec


Epoch: [91]/(94/1313), Train Loss: 0.0335, Accuracy: 0.92, Time: 8.70 sec
Epoch: [91]/(188/1313), Train Loss: 0.1588, Accuracy: 0.92, Time: 17.30 sec
Epoch: [91]/(282/1313), Train Loss: 0.3719, Accuracy: 0.92, Time: 26.02 sec
Epoch: [91]/(376/1313), Train Loss: 0.1745, Accuracy: 0.93, Time: 33.56 sec
Epoch: [91]/(470/1313), Train Loss: 0.1641, Accuracy: 0.92, Time: 41.49 sec
Epoch: [91]/(564/1313), Train Loss: 0.0730, Accuracy: 0.92, Time: 50.02 sec
Epoch: [91]/(658/1313), Train Loss: 0.4036, Accuracy: 0.92, Time: 59.17 sec
Epoch: [91]/(752/1313), Train Loss: 0.2782, Accuracy: 0.92, Time: 68.61 sec
Epoch: [91]/(846/1313), Train Loss: 0.1447, Accuracy: 0.92, Time: 76.82 sec
Epoch: [91]/(940/1313), Train Loss: 0.2613, Accuracy: 0.92, Time: 85.43 sec
Epoch: [91]/(1034/1313), Train Loss: 0.1183, Accuracy: 0.92, Time: 94.91 sec
Epoch: [91]/(1128/1313), Train Loss: 0.0055, Accuracy: 0.92, Time: 102.43 sec
Epoch: [91]/(1222/1313), Train Loss: 0.1524, Accuracy: 0.92, Time: 110.93 sec
Epoch: [91], Test Loss: 1.0518, Accuracy: 0.76, Time: 26.04 sec


Epoch: [92]/(94/1313), Train Loss: 0.0775, Accuracy: 0.93, Time: 8.61 sec
Epoch: [92]/(188/1313), Train Loss: 0.1792, Accuracy: 0.92, Time: 17.16 sec
Epoch: [92]/(282/1313), Train Loss: 0.2509, Accuracy: 0.93, Time: 25.85 sec
Epoch: [92]/(376/1313), Train Loss: 0.1299, Accuracy: 0.93, Time: 33.52 sec
Epoch: [92]/(470/1313), Train Loss: 0.1102, Accuracy: 0.93, Time: 41.34 sec
Epoch: [92]/(564/1313), Train Loss: 0.1214, Accuracy: 0.93, Time: 49.97 sec
Epoch: [92]/(658/1313), Train Loss: 0.1835, Accuracy: 0.93, Time: 59.25 sec
Epoch: [92]/(752/1313), Train Loss: 0.1831, Accuracy: 0.92, Time: 68.74 sec
Epoch: [92]/(846/1313), Train Loss: 0.5518, Accuracy: 0.92, Time: 76.86 sec
Epoch: [92]/(940/1313), Train Loss: 0.2903, Accuracy: 0.92, Time: 85.51 sec
Epoch: [92]/(1034/1313), Train Loss: 0.1452, Accuracy: 0.92, Time: 94.72 sec
Epoch: [92]/(1128/1313), Train Loss: 0.1840, Accuracy: 0.92, Time: 102.42 sec
Epoch: [92]/(1222/1313), Train Loss: 0.3088, Accuracy: 0.92, Time: 111.00 sec
Epoch: [92], Test Loss: 1.0355, Accuracy: 0.76, Time: 25.82 sec


Epoch: [93]/(94/1313), Train Loss: 0.0407, Accuracy: 0.93, Time: 8.62 sec
Epoch: [93]/(188/1313), Train Loss: 0.0544, Accuracy: 0.92, Time: 17.31 sec
Epoch: [93]/(282/1313), Train Loss: 0.3944, Accuracy: 0.92, Time: 26.06 sec
Epoch: [93]/(376/1313), Train Loss: 0.3055, Accuracy: 0.92, Time: 33.62 sec
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Epoch: [93]/(470/1313), Train Loss: 0.1449, Accuracy: 0.92, Time: 41.45 sec
Epoch: [93]/(564/1313), Train Loss: 0.0186, Accuracy: 0.92, Time: 49.96 sec
Epoch: [93]/(658/1313), Train Loss: 0.6880, Accuracy: 0.92, Time: 59.03 sec
Epoch: [93]/(752/1313), Train Loss: 0.1462, Accuracy: 0.92, Time: 68.52 sec
Epoch: [93]/(846/1313), Train Loss: 0.0991, Accuracy: 0.92, Time: 76.78 sec
Epoch: [93]/(940/1313), Train Loss: 0.0720, Accuracy: 0.92, Time: 85.36 sec
Epoch: [93]/(1034/1313), Train Loss: 0.1734, Accuracy: 0.92, Time: 94.55 sec
Epoch: [93]/(1128/1313), Train Loss: 0.5740, Accuracy: 0.92, Time: 102.10 sec
Epoch: [93]/(1222/1313), Train Loss: 0.0658, Accuracy: 0.92, Time: 110.56 sec
Epoch: [93], Test Loss: 0.9672, Accuracy: 0.77, Time: 25.74 sec


Epoch: [94]/(94/1313), Train Loss: 0.2273, Accuracy: 0.94, Time: 8.82 sec
Epoch: [94]/(188/1313), Train Loss: 0.1117, Accuracy: 0.93, Time: 17.35 sec
Epoch: [94]/(282/1313), Train Loss: 0.1656, Accuracy: 0.93, Time: 26.21 sec
Epoch: [94]/(376/1313), Train Loss: 0.1786, Accuracy: 0.93, Time: 33.87 sec
Epoch: [94]/(470/1313), Train Loss: 0.1308, Accuracy: 0.93, Time: 41.75 sec
Epoch: [94]/(564/1313), Train Loss: 0.0861, Accuracy: 0.93, Time: 50.45 sec
Epoch: [94]/(658/1313), Train Loss: 0.4667, Accuracy: 0.93, Time: 59.50 sec
Epoch: [94]/(752/1313), Train Loss: 0.1601, Accuracy: 0.92, Time: 69.13 sec
Epoch: [94]/(846/1313), Train Loss: 0.2233, Accuracy: 0.93, Time: 77.37 sec
Epoch: [94]/(940/1313), Train Loss: 0.2078, Accuracy: 0.92, Time: 85.96 sec
Epoch: [94]/(1034/1313), Train Loss: 0.1087, Accuracy: 0.93, Time: 95.12 sec
Epoch: [94]/(1128/1313), Train Loss: 0.0084, Accuracy: 0.93, Time: 102.68 sec
Epoch: [94]/(1222/1313), Train Loss: 0.1844, Accuracy: 0.92, Time: 111.04 sec
Epoch: [94], Test Loss: 0.9964, Accuracy: 0.78, Time: 25.78 sec


Epoch: [95]/(94/1313), Train Loss: 0.1172, Accuracy: 0.93, Time: 8.81 sec
Epoch: [95]/(188/1313), Train Loss: 0.4694, Accuracy: 0.93, Time: 17.52 sec
Epoch: [95]/(282/1313), Train Loss: 0.5793, Accuracy: 0.93, Time: 26.31 sec
Epoch: [95]/(376/1313), Train Loss: 0.2830, Accuracy: 0.93, Time: 33.89 sec
Epoch: [95]/(470/1313), Train Loss: 0.0701, Accuracy: 0.93, Time: 41.82 sec
Epoch: [95]/(564/1313), Train Loss: 0.1078, Accuracy: 0.93, Time: 50.40 sec
Epoch: [95]/(658/1313), Train Loss: 0.5549, Accuracy: 0.93, Time: 59.49 sec
Epoch: [95]/(752/1313), Train Loss: 0.7402, Accuracy: 0.93, Time: 68.89 sec
Epoch: [95]/(846/1313), Train Loss: 0.0326, Accuracy: 0.93, Time: 77.00 sec
Epoch: [95]/(940/1313), Train Loss: 0.3370, Accuracy: 0.93, Time: 85.68 sec
Epoch: [95]/(1034/1313), Train Loss: 0.3742, Accuracy: 0.93, Time: 94.98 sec
Epoch: [95]/(1128/1313), Train Loss: 0.2006, Accuracy: 0.93, Time: 102.63 sec
Epoch: [95]/(1222/1313), Train Loss: 0.2573, Accuracy: 0.93, Time: 111.21 sec
Epoch: [95], Test Loss: 1.1019, Accuracy: 0.76, Time: 26.19 sec


Epoch: [96]/(94/1313), Train Loss: 0.1359, Accuracy: 0.93, Time: 8.62 sec
Epoch: [96]/(188/1313), Train Loss: 0.1992, Accuracy: 0.93, Time: 17.31 sec
Epoch: [96]/(282/1313), Train Loss: 0.4099, Accuracy: 0.92, Time: 25.94 sec
Epoch: [96]/(376/1313), Train Loss: 0.3107, Accuracy: 0.92, Time: 33.46 sec
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Epoch: [96]/(470/1313), Train Loss: 0.1212, Accuracy: 0.92, Time: 41.12 sec
Epoch: [96]/(564/1313), Train Loss: 0.2967, Accuracy: 0.92, Time: 49.87 sec
Epoch: [96]/(658/1313), Train Loss: 0.2715, Accuracy: 0.92, Time: 58.96 sec
Epoch: [96]/(752/1313), Train Loss: 0.4336, Accuracy: 0.92, Time: 68.49 sec
Epoch: [96]/(846/1313), Train Loss: 0.0200, Accuracy: 0.92, Time: 76.76 sec
Epoch: [96]/(940/1313), Train Loss: 0.2062, Accuracy: 0.92, Time: 85.50 sec
Epoch: [96]/(1034/1313), Train Loss: 0.0512, Accuracy: 0.92, Time: 94.91 sec
Epoch: [96]/(1128/1313), Train Loss: 0.1730, Accuracy: 0.92, Time: 102.53 sec
Epoch: [96]/(1222/1313), Train Loss: 0.2214, Accuracy: 0.92, Time: 111.16 sec
Epoch: [96], Test Loss: 1.0540, Accuracy: 0.77, Time: 26.26 sec


Epoch: [97]/(94/1313), Train Loss: 0.1713, Accuracy: 0.94, Time: 8.64 sec
Epoch: [97]/(188/1313), Train Loss: 0.0552, Accuracy: 0.93, Time: 17.20 sec
Epoch: [97]/(282/1313), Train Loss: 0.1433, Accuracy: 0.93, Time: 26.22 sec
Epoch: [97]/(376/1313), Train Loss: 0.1058, Accuracy: 0.93, Time: 33.98 sec
Epoch: [97]/(470/1313), Train Loss: 0.0365, Accuracy: 0.93, Time: 42.03 sec
Epoch: [97]/(564/1313), Train Loss: 0.1213, Accuracy: 0.93, Time: 50.82 sec
Epoch: [97]/(658/1313), Train Loss: 0.1331, Accuracy: 0.93, Time: 60.21 sec
Epoch: [97]/(752/1313), Train Loss: 0.1901, Accuracy: 0.93, Time: 70.06 sec
Epoch: [97]/(846/1313), Train Loss: 0.1171, Accuracy: 0.93, Time: 78.31 sec
Epoch: [97]/(940/1313), Train Loss: 0.0288, Accuracy: 0.93, Time: 87.08 sec
Epoch: [97]/(1034/1313), Train Loss: 0.1591, Accuracy: 0.93, Time: 96.56 sec
Epoch: [97]/(1128/1313), Train Loss: 0.0521, Accuracy: 0.93, Time: 104.24 sec
Epoch: [97]/(1222/1313), Train Loss: 0.0623, Accuracy: 0.93, Time: 112.86 sec
Epoch: [97], Test Loss: 0.9768, Accuracy: 0.78, Time: 25.97 sec


Epoch: [98]/(94/1313), Train Loss: 0.0790, Accuracy: 0.93, Time: 8.67 sec
Epoch: [98]/(188/1313), Train Loss: 0.1262, Accuracy: 0.93, Time: 17.30 sec
Epoch: [98]/(282/1313), Train Loss: 0.3620, Accuracy: 0.93, Time: 26.01 sec
Epoch: [98]/(376/1313), Train Loss: 0.3681, Accuracy: 0.93, Time: 33.67 sec
Epoch: [98]/(470/1313), Train Loss: 0.2737, Accuracy: 0.93, Time: 41.66 sec
Epoch: [98]/(564/1313), Train Loss: 0.1359, Accuracy: 0.93, Time: 50.37 sec
Epoch: [98]/(658/1313), Train Loss: 0.0870, Accuracy: 0.93, Time: 59.65 sec
Epoch: [98]/(752/1313), Train Loss: 0.3459, Accuracy: 0.93, Time: 69.28 sec
Epoch: [98]/(846/1313), Train Loss: 0.2211, Accuracy: 0.93, Time: 77.76 sec
Epoch: [98]/(940/1313), Train Loss: 0.1196, Accuracy: 0.93, Time: 86.42 sec
Epoch: [98]/(1034/1313), Train Loss: 0.0219, Accuracy: 0.93, Time: 95.75 sec
Epoch: [98]/(1128/1313), Train Loss: 0.1859, Accuracy: 0.93, Time: 103.52 sec
Epoch: [98]/(1222/1313), Train Loss: 0.0409, Accuracy: 0.93, Time: 112.27 sec
Epoch: [98], Test Loss: 1.0747, Accuracy: 0.78, Time: 25.98 sec


Epoch: [99]/(94/1313), Train Loss: 0.0601, Accuracy: 0.93, Time: 8.97 sec
Epoch: [99]/(188/1313), Train Loss: 0.1166, Accuracy: 0.93, Time: 17.59 sec
Epoch: [99]/(282/1313), Train Loss: 0.2917, Accuracy: 0.93, Time: 26.48 sec
Epoch: [99]/(376/1313), Train Loss: 0.2113, Accuracy: 0.93, Time: 34.01 sec
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Epoch: [99]/(470/1313), Train Loss: 0.2077, Accuracy: 0.93, Time: 42.01 sec
Epoch: [99]/(564/1313), Train Loss: 0.0992, Accuracy: 0.92, Time: 50.77 sec
Epoch: [99]/(658/1313), Train Loss: 0.1859, Accuracy: 0.92, Time: 59.76 sec
Epoch: [99]/(752/1313), Train Loss: 0.3714, Accuracy: 0.92, Time: 69.24 sec
Epoch: [99]/(846/1313), Train Loss: 0.0475, Accuracy: 0.92, Time: 77.51 sec
Epoch: [99]/(940/1313), Train Loss: 0.1900, Accuracy: 0.92, Time: 86.27 sec
Epoch: [99]/(1034/1313), Train Loss: 0.0341, Accuracy: 0.93, Time: 95.40 sec
Epoch: [99]/(1128/1313), Train Loss: 0.0418, Accuracy: 0.93, Time: 102.91 sec
Epoch: [99]/(1222/1313), Train Loss: 0.2093, Accuracy: 0.93, Time: 111.32 sec
Epoch: [99], Test Loss: 1.0281, Accuracy: 0.77, Time: 25.58 sec


Epoch: [100]/(94/1313), Train Loss: 0.0425, Accuracy: 0.93, Time: 8.60 sec
Epoch: [100]/(188/1313), Train Loss: 0.0576, Accuracy: 0.93, Time: 17.21 sec
Epoch: [100]/(282/1313), Train Loss: 0.1152, Accuracy: 0.93, Time: 26.06 sec
Epoch: [100]/(376/1313), Train Loss: 0.5070, Accuracy: 0.93, Time: 33.54 sec
Epoch: [100]/(470/1313), Train Loss: 0.0677, Accuracy: 0.93, Time: 41.35 sec
Epoch: [100]/(564/1313), Train Loss: 0.2095, Accuracy: 0.93, Time: 49.91 sec
Epoch: [100]/(658/1313), Train Loss: 0.2858, Accuracy: 0.93, Time: 59.20 sec
Epoch: [100]/(752/1313), Train Loss: 0.4428, Accuracy: 0.93, Time: 68.84 sec
Epoch: [100]/(846/1313), Train Loss: 0.2321, Accuracy: 0.93, Time: 77.19 sec
Epoch: [100]/(940/1313), Train Loss: 0.0990, Accuracy: 0.93, Time: 85.85 sec
Epoch: [100]/(1034/1313), Train Loss: 0.1237, Accuracy: 0.93, Time: 95.11 sec
Epoch: [100]/(1128/1313), Train Loss: 0.2322, Accuracy: 0.93, Time: 102.84 sec
Epoch: [100]/(1222/1313), Train Loss: 0.1912, Accuracy: 0.93, Time: 111.26 sec
Epoch: [100], Test Loss: 0.9933, Accuracy: 0.78, Time: 26.10 sec
```

0.0.13 Test the same Images

[17]:
```python
# # Uncomment the below two lines if you want to use the pre trained model for 100 epoch
# model = torch.load('BasicCNN_Pytorch/model_100.pth', map_location=device)
# model.eval()

denormalize = transforms.Compose([
    transforms.Normalize(mean = -mean/std, std = 1./std),
    transforms.ToPILImage()
])


with torch.no_grad():

    for impath in os.listdir('BasicCNN_Pytorch/test_images/'):
        try:
```

```
            image = Image.open(f'BasicCNN_Pytorch/test_images/{impath}')
        except:
            continue

        image = transforms.Compose([
            transforms.Resize(256),
            transforms.CenterCrop(256),
            transforms.ToTensor(),
            transforms.Normalize(mean=mean, std=std)
        ])(image)

        image_tensor = image.view(1,3,256,256).to(device)

        moutput = model(image_tensor)
        moutput = nn.Softmax(dim=1)(moutput)[0]*100

        idx = moutput.argmax().data.item()
        oclass = list(translate.keys())[idx]
        moutput = moutput.int().data.cpu().numpy()

        display(denormalize(image))
        print(translate[oclass], ':', moutput[idx], '%', '\n\n')

model.train()
pass
```

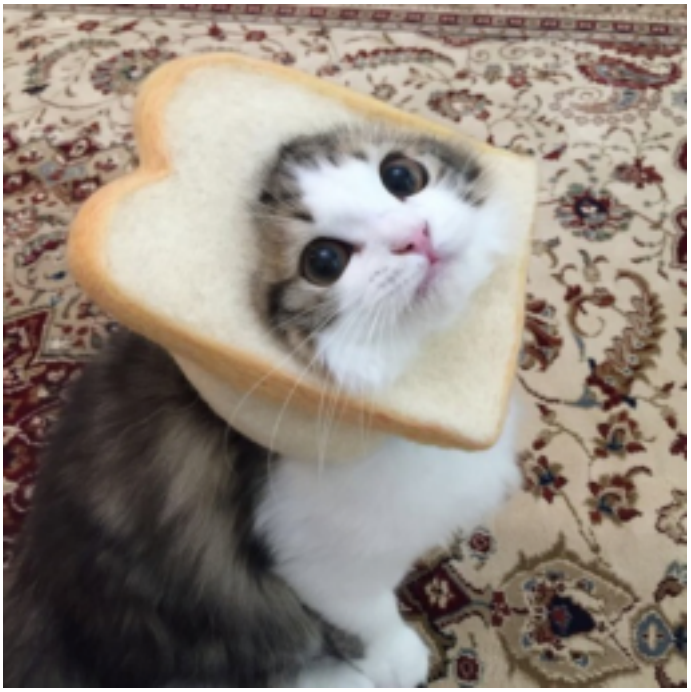
```
chicken : 100 %
```

```
spider : 99 %
```

```
cow : 79 %
```

```
squirrel : 100 %
```

```
dog : 99 %
```



```
cat : 99 %
```

```
elephant : 100 %
```

```
sheep : 99 %
```

```
dog : 99 %
```

```
cow : 42 %
```

```
cat : 89 %
```

```
butterfly : 99 %
```

```
elephant : 100 %
```

```
dog : 100 %
```

```
horse : 99 %
```

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