prodigy-ex-04

July 27, 2024

[1]:
```
pip install torch
```

```
Requirement already satisfied: torch in c:\users\abarn\anaconda3\lib\site-
packages (2.1.2)
Requirement already satisfied: typing-extensions in
c:\users\abarn\anaconda3\lib\site-packages (from torch) (4.3.0)
Requirement already satisfied: networkx in c:\users\abarn\anaconda3\lib\site-
packages (from torch) (2.8.4)
Requirement already satisfied: filelock in c:\users\abarn\anaconda3\lib\site-
packages (from torch) (3.6.0)
Requirement already satisfied: jinja2 in c:\users\abarn\anaconda3\lib\site-
packages (from torch) (2.11.3)
Requirement already satisfied: sympy in c:\users\abarn\anaconda3\lib\site-
packages (from torch) (1.10.1)
Requirement already satisfied: fsspec in c:\users\abarn\anaconda3\lib\site-
packages (from torch) (2022.7.1)
Requirement already satisfied: MarkupSafe>=0.23 in
c:\users\abarn\anaconda3\lib\site-packages (from jinja2->torch) (2.0.1)
Requirement already satisfied: mpmath>=0.19 in
c:\users\abarn\anaconda3\lib\site-packages (from sympy->torch) (1.2.1)
Note: you may need to restart the kernel to use updated packages.
```

[2]:
```
pip install torchvision
```

```
Requirement already satisfied: torchvision in c:\users\abarn\anaconda3\lib\site-
packages (0.16.2)
Requirement already satisfied: requests in c:\users\abarn\anaconda3\lib\site-
packages (from torchvision) (2.28.1)
Requirement already satisfied: torch==2.1.2 in
c:\users\abarn\anaconda3\lib\site-packages (from torchvision) (2.1.2)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in
c:\users\abarn\anaconda3\lib\site-packages (from torchvision) (9.2.0)
Requirement already satisfied: numpy in c:\users\abarn\anaconda3\lib\site-
packages (from torchvision) (1.24.4)
Requirement already satisfied: fsspec in c:\users\abarn\anaconda3\lib\site-
packages (from torch==2.1.2->torchvision) (2022.7.1)
Requirement already satisfied: typing-extensions in
c:\users\abarn\anaconda3\lib\site-packages (from torch==2.1.2->torchvision)
```

```
(4.3.0)
Requirement already satisfied: sympy in c:\users\abarn\anaconda3\lib\site-
packages (from torch==2.1.2->torchvision) (1.10.1)
Requirement already satisfied: filelock in c:\users\abarn\anaconda3\lib\site-
packages (from torch==2.1.2->torchvision) (3.6.0)
Requirement already satisfied: networkx in c:\users\abarn\anaconda3\lib\site-
packages (from torch==2.1.2->torchvision) (2.8.4)
Requirement already satisfied: jinja2 in c:\users\abarn\anaconda3\lib\site-
packages (from torch==2.1.2->torchvision) (2.11.3)
Requirement already satisfied: idna<4,>=2.5 in
c:\users\abarn\anaconda3\lib\site-packages (from requests->torchvision) (3.3)
Requirement already satisfied: certifi>=2017.4.17 in
c:\users\abarn\anaconda3\lib\site-packages (from requests->torchvision)
(2022.9.14)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
c:\users\abarn\anaconda3\lib\site-packages (from requests->torchvision)
(1.26.11)
Requirement already satisfied: charset-normalizer<3,>=2 in
c:\users\abarn\anaconda3\lib\site-packages (from requests->torchvision) (2.0.4)
Requirement already satisfied: MarkupSafe>=0.23 in
c:\users\abarn\anaconda3\lib\site-packages (from
jinja2->torch==2.1.2->torchvision) (2.0.1)
Requirement already satisfied: mpmath>=0.19 in
c:\users\abarn\anaconda3\lib\site-packages (from
sympy->torch==2.1.2->torchvision) (1.2.1)
Note: you may need to restart the kernel to use updated packages.
```

[3]:
```
import os
import random
import numpy as np
import pandas as pd
import torch
import torch.nn as nn
import torch.nn.functional as F
from tqdm.notebook import tqdm
from torchvision import datasets, transforms, models
from torchvision.datasets import ImageFolder
from torchvision.transforms import ToTensor
from torchvision.utils import make_grid
from torch.utils.data import random_split
from torch.utils.data.dataloader import DataLoader
import matplotlib.pyplot as plt
%matplotlib inline
```

[4]:
```
train_dir = 'train'
test_dir = 'test'
classes = os.listdir(train_dir)
```

[5]:
```
train_transform=transforms.Compose([
        transforms.RandomRotation(10),      # rotate +/- 10 degrees
        transforms.RandomHorizontalFlip(),  # reverse 50% of images
        transforms.Resize(40),              # resize shortest side
        transforms.CenterCrop(40),          # crop longest side
        transforms.ToTensor(),
        transforms.Normalize([0.485, 0.456, 0.406],
                             [0.229, 0.224, 0.225])
])
```

[6]:
```
dataset = ImageFolder(train_dir, transform=train_transform)
testset = ImageFolder(test_dir, transform=train_transform)
print(len(dataset))
```

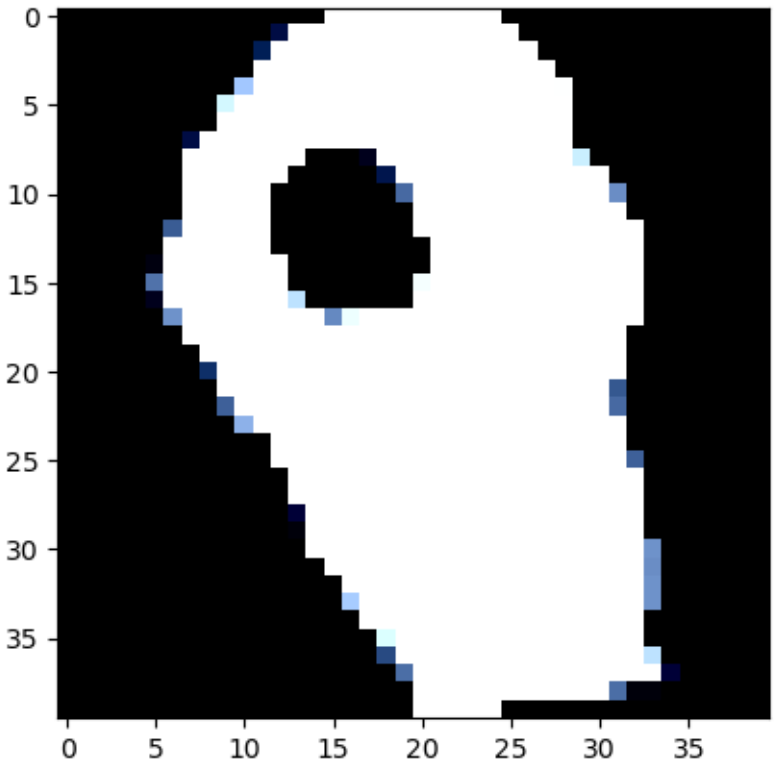
```
18000
```

[7]:
```
# function for the showing the image.
def show_image(img,label):
    print('Label: ', dataset.classes[label], "("+str(label)+")")
    plt.imshow(img.permute(1,2,0))
```

[8]:
```
show_image(*dataset[6])
```

```
Clipping input data to the valid range for imshow with RGB data ([0..1] for
floats or [0..255] for integers).
```

```
Label:  train (0)
```



[9]:
```
torch.manual_seed(10)
val_size=len(dataset)//5
train_size=len(dataset) - val_size
train_ds, val_ds = random_split(dataset, [train_size, val_size])
test_ds = testset
len(train_ds), len(val_ds), len(test_ds)
```

[9]: (14400, 3600, 6000)

[10]:
```
batch_size = 64
train_loader = DataLoader(train_ds, batch_size, shuffle=True, num_workers=4,␣
 ↪pin_memory=True)
val_loader = DataLoader(val_ds, batch_size*2, num_workers=4, pin_memory=True)
test_loader = DataLoader(test_ds, batch_size*2, num_workers=4, pin_memory=True)
```

[11]:
```
for images, labels in train_loader:
    fig, ax = plt.subplots(figsize=(18,10))
    ax.set_xticks([])
    ax.set_yticks([])
    ax.imshow(make_grid(images,nrow=16).permute(1,2,0))
    break
```

```
Clipping input data to the valid range for imshow with RGB data ([0..1] for
floats or [0..255] for integers).
```

[ ]: