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import torch
import torch as th
import torch.nn as nn
import torch.nn.functional as F
from torchvision import transforms
from torch.utils.data import Dataset, DataLoader

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
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import os
import numpy as np
import os.path as osp
import json
from tqdm import tqdm
from PIL import Image
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from utils import Config
```

```
class polyvore_dataset:
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```
    def __init__(self):
        self.root_dir = Config['root_path']
        self.image_dir = osp.join(self.root_dir, 'images')
        self.transforms = self.get_data_transforms()
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```
    def get_data_transforms(self):
        data_transforms = {
            'train': transforms.Compose([
                # transforms.CenterCrop(224),
                # transforms.RandomHorizontalFlip(),
                # transforms.RandomRotation(20),
                transforms.Resize(256),
                transforms.CenterCrop(224),
                transforms.ToTensor(),
                transforms.Normalize( mean=[0.5, 0.5, 0.5], std=[0.5, 0.5, 0.5])
            ]),
            'val': transforms.Compose([
                transforms.Resize(256),
                transforms.CenterCrop(224),
                transforms.ToTensor(),
                transforms.Normalize( mean=[0.5, 0.5, 0.5], std=[0.5, 0.5, 0.5])
            ]),
            'test': transforms.Compose([
                transforms.Resize(256),
                transforms.CenterCrop(224),
                transforms.ToTensor(),
                transforms.Normalize( mean=[0.5, 0.5, 0.5], std=[0.5, 0.5, 0.5])
            ]),
        }
        return data_transforms
```

```
    def create_dataset(self):
        # map id to category
        meta_file = open(osp.join(self.root_dir, Config['meta_file']), 'r')
        meta_json = json.load(meta_file)
        id_to_category = {}
        for k, v in tqdm(meta_json.items()):
            id_to_category[k] = v['category_id']
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        # create X, y pairs
        files = os.listdir(self.image_dir)
        X = []; y = []
        for x in files:
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    if x[:-4] in id_to_category:
        X.append(x)
        y.append(int(id_to_category[x[:-4]]))

y = LabelEncoder().fit_transform(y)
print('len of X: {}, # of categories: {}'.format(len(X), max(y) + 1))

# split dataset 12% - Test, 20% - Val, 68% - Train
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.1)
X_train, X_val, y_train, y_val = train_test_split(
    X_train, y_train, test_size=0.1) # 0.15 x 0.8 = 1.2
return X_train, X_test, X_val, y_train, y_test, y_val, max(y) + 1

# For category classification
class polyvore_train(Dataset):
    def __init__(self, X_train, y_train, transform):
        self.X_train = X_train
        self.y_train = y_train
        self.transform = transform
        self.image_dir = osp.join(Config['root_path'], 'images')

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

    def __getitem__(self, item):
        file_path = osp.join(self.image_dir, self.X_train[item])
        return self.transform(Image.open(file_path)), self.y_train[item]

class polyvore_val(Dataset):
    def __init__(self, X_val, y_val, transform):
        self.X_val = X_val
        self.y_val = y_val
        self.transform = transform
        self.image_dir = osp.join(Config['root_path'], 'images')

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

    def __getitem__(self, item):
        file_path = osp.join(self.image_dir, self.X_val[item])
        return self.transform(Image.open(file_path)), self.y_val[item]

class polyvore_test(Dataset):
    def __init__(self, X_test, y_test, transform):
        self.X_test = X_test
        self.y_test = y_test
        self.transform = transform
        self.image_dir = osp.join(Config['root_path'], 'images')

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

    def __getitem__(self, item):
        file_path = osp.join(self.image_dir, self.X_test[item])
        item_id = file_path.rsplit('/', 1)[1].split(".")[0]
        return self.transform(Image.open(file_path)), self.y_test[item], item_id

def get_dataloader(debug, batch_size, num_workers):
    dataset = polyvore_dataset()
    transforms = dataset.get_data_transforms()
    X_train, X_test, X_val, y_train, y_test, y_val, classes = dataset.create_dataset()

```

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if debug==True:
    train_limit = 100000
    test_limit, val_limit = 10000, 10000

    train_set = polyvore_train(X_train[:train_limit], y_train[:train_limit], transform=transforms['train'])
    val_set = polyvore_val(X_val[:val_limit], y_val[:val_limit], transform=transforms['val'])
    test_set = polyvore_test(X_test[:test_limit], y_test[:test_limit], transform=transforms['test'])
    dataset_size = {'train': len(y_train[:train_limit]), 'test': len(y_test[:test_limit]), 'val': len(y_val[:val_limit])}
else:
    train_set = polyvore_train(X_train, y_train, transforms['train'])
    val_set = polyvore_val(X_val, y_val, transforms['val'])
    test_set = polyvore_test(X_test, y_test, transforms['test'])
    dataset_size = {'train': len(y_train), 'test': len(y_test), 'val': len(y_val)}

datasets = {'train': train_set, 'test': test_set, 'val': val_set}
dataloaders = {x: DataLoader(datasets[x],
                             shuffle=True if x=='train' else False,
                             batch_size=batch_size,
                             num_workers=num_workers)
               for x in ['train', 'test', 'val']}

return dataloaders, classes, dataset_size

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