Colab training notebook

This notebook runs the existing training code from the repository on Google Colab (GPU runtime). It installs required packages, mounts Google Drive optionally for dataset/checkpoints, and calls the train entrypoint in `src/train.py` so functionality remains unchanged.

Notes:

- Make sure your dataset folder has `dr_labels.csv` and a `DR_images/` subfolder.
- You can either upload the `data/` folder to Colab session storage, or mount Google Drive and point `--data-dir` to a folder on Drive.
- If you prefer to run from a GitHub repo, upload this workspace to a public GitHub and use the git clone cell below.

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

```
Mounted at /content/drive
```

```
%cd /content
```

```
/content
```

```
mkdir /content/Diabetic-Retinopathy
```

```
!rm -rf /content/Diabetic-Retinopathy/
!git clone https://github.com/Ojasvsakhi/Diabetic-Retinopathy.git /content/Diabetic-Retinopathy
%cd /content/Diabetic-Retinopathy
```

```
Cloning into '/content/Diabetic-Retinopathy'...
remote: Enumerating objects: 83, done.
remote: Counting objects: 100% (83/83), done.
remote: Compressing objects: 100% (61/61), done.
remote: Total 83 (delta 38), reused 55 (delta 19), pack-reused 0 (from 0)
Receiving objects: 100% (83/83), 119.11 KiB | 1.05 MiB/s, done.
Resolving deltas: 100% (38/38), done.
```

```
/content/Diabetic-Retinopathy
```

```
!pip install -q torch torchvision --extra-index-url https://download.pytorch.org/whl/cu117
!pip install -r requirements_colab.txt --quiet
```

```
import os
DATA_DIR = '/content/drive/MyDrive/DR Dataset'
if not os.path.exists(DATA_DIR):
    print('Warning: expected DATA_DIR not found:', DATA_DIR)
else:
    print('Using DATA_DIR =', DATA_DIR)
```

```
Using DATA_DIR = /content/drive/MyDrive/DR Dataset
```

```
import sys, os
repo_src = os.path.join(os.getcwd(), 'src')
if os.path.exists(repo_src):
    sys.path.insert(0, repo_src)
else:
    sys.path.append('src')

from argparse import Namespace
from src.train import train

args = Namespace(
    data_dir=DATA_DIR,
    epochs=20,
    batch_size=16,
    img_size=224,
    lr=1e-4,
    num_workers=2
)

# Training
train(args)
```

```
/usr/local/lib/python3.12/dist-packages/torchvision/models/_utils.py:208: UserWarning: The parameter 'pretrained' is deprecat
  warnings.warn(
/usr/local/lib/python3.12/dist-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or
  warnings.warn(msg)
Downloading: "https://download.pytorch.org/models/resnet50-0676ba61.pth" to /root/.cache/torch/hub/checkpoints/resnet50-0676b
100%|██████████| 97.8M/97.8M [00:00<00:00, 142MB/s]
Using class weights: [2.3294117  5.28       0.58666664 1.0153847  0.5910448 ]
Epoch 1/20 [train]: 100%|██████████| 25/25 [03:02<00:00,  7.31s/it, loss=1.79]
Validation: 100%|██████████| 7/7 [00:44<00:00,  6.34s/it]
Epoch 1 validation -- acc: 0.4747 macro-F1: 0.3901
Epoch 2/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.54s/it, loss=1.4]
Validation: 100%|██████████| 7/7 [00:08<00:00,  1.23s/it]
Epoch 2 validation -- acc: 0.5657 macro-F1: 0.4759
Epoch 3/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.54s/it, loss=1.14]
Validation: 100%|██████████| 7/7 [00:10<00:00,  1.44s/it]
Epoch 3 validation -- acc: 0.5051 macro-F1: 0.4948
Epoch 4/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.55s/it, loss=0.775]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.37s/it]
Epoch 4 validation -- acc: 0.5960 macro-F1: 0.5678
Epoch 5/20 [train]: 100%|██████████| 25/25 [00:37<00:00,  1.50s/it, loss=0.521]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.42s/it]
Epoch 5 validation -- acc: 0.5354 macro-F1: 0.4115
Epoch 6/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.55s/it, loss=0.57]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.35s/it]
Epoch 6 validation -- acc: 0.5758 macro-F1: 0.5782
Epoch 7/20 [train]: 100%|██████████| 25/25 [00:37<00:00,  1.52s/it, loss=0.368]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.41s/it]
Epoch 7 validation -- acc: 0.5556 macro-F1: 0.5123
Epoch 8/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.55s/it, loss=0.321]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.40s/it]
Epoch 8 validation -- acc: 0.6465 macro-F1: 0.6091
Epoch 9/20 [train]: 100%|██████████| 25/25 [00:39<00:00,  1.56s/it, loss=0.232]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.36s/it]
Epoch 9 validation -- acc: 0.5657 macro-F1: 0.5491
Epoch 10/20 [train]: 100%|██████████| 25/25 [00:39<00:00,  1.57s/it, loss=0.208]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.41s/it]
Epoch 10 validation -- acc: 0.6061 macro-F1: 0.5535
Epoch 11/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.55s/it, loss=0.197]
Validation: 100%|██████████| 7/7 [00:08<00:00,  1.23s/it]
Epoch 11 validation -- acc: 0.5758 macro-F1: 0.5167
Learning rates reduced: [0.0001] -> [5e-05]
Epoch 12/20 [train]: 100%|██████████| 25/25 [00:39<00:00,  1.56s/it, loss=0.195]
Validation: 100%|██████████| 7/7 [00:09<00:00,  1.41s/it]
Epoch 12 validation -- acc: 0.6566 macro-F1: 0.6200
Epoch 13/20 [train]: 100%|██████████| 25/25 [00:37<00:00,  1.52s/it, loss=0.124]
Validation: 100%|██████████| 7/7 [00:08<00:00,  1.26s/it]
Epoch 13 validation -- acc: 0.6364 macro-F1: 0.6035
```

```
Epoch 14/20 [train]: 100%|██████████| 25/25 [00:39<00:00,  1.56s/it, loss=0.104]
Validation: 100%|██████████| 7/7 [00:10<00:00,  1.45s/it]
Epoch 14 validation -- acc: 0.5960 macro-F1: 0.5508
Epoch 15/20 [train]: 100%|██████████| 25/25 [00:39<00:00,  1.58s/it, loss=0.0866]
Validation: 100%|██████████| 7/7 [00:08<00:00,  1.21s/it]
Epoch 15 validation -- acc: 0.6566 macro-F1: 0.6131
Learning rates reduced: [5e-05] -> [2.5e-05]
Epoch 16/20 [train]: 100%|██████████| 25/25 [00:38<00:00,  1.55s/it, loss=0.0433]
Validation: 100%|██████████| 7/7 [00:10<00:00,  1.43s/it]
Epoch 16 validation -- acc: 0.6465 macro-F1: 0.6043
```