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

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

```
!git clone https://github.com/VICO-UoE/DatasetCondensation
%cd DatasetCondensation
```

```
Cloning into 'DatasetCondensation'...
remote: Enumerating objects: 271, done.
remote: Counting objects: 100% (138/138), done.
remote: Compressing objects: 100% (64/64), done.
remote: Total 271 (delta 126), reused 74 (delta 74), pack-reused 133 (from 1)
Receiving objects: 100% (271/271), 4.54 MiB | 19.53 MiB/s, done.
Resolving deltas: 100% (152/152), done.
/content/DatasetCondensation
```

```
!pip install -r requirements.txt
```

```
Collecting numpy==1.15.1 (from -r requirements.txt (line 1))
  Downloading numpy-1.15.1.zip (4.5 MB)
     ---------------------------------------- 4.5/4.5 MB 15.1 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Collecting scipy==1.1.0 (from -r requirements.txt (line 2))
  Downloading scipy-1.1.0.tar.gz (15.6 MB)
     ---------------------------------------- 15.6/15.6 MB 100.6 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
ERROR: Ignored the following versions that require a different python version: 1.6.2 Requires-Python >=3.7,<3.10; 1.6.3 Requires-Python >=3.7,<3.10; 1.7.0 Requires-Python >=3.7,<3.10; 1.7.1 Requires-Python >=3.7,<3.10
ERROR: Could not find a version that satisfies the requirement torch==1.2.0 (from versions: 1.11.0, 1.12.0, 1.12.1, 1.13.0, 1.13.1, 2.0.0, 2.0.1, 2.1.0, 2.1.1, 2.1.2, 2.2.0, 2.2.1, 2.2.2, 2.3.0, 2.3.1, 2.4.0, 2.4.1, 2.5.0, 2.5.1)
ERROR: No matching distribution found for torch==1.2.0
```

```
from torchvision.datasets import MNIST
from torchvision import transforms

# download MNIST dataset
mnist_data = MNIST(root='./data', train=True, download=True, transform=transforms.ToTensor())
```

```
Downloading http://yann.lecun.com/exdb/mnist/train-images-idx3-ubyte.gz
Failed to download (trying next):
<urlopen error [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed: certificate has expired (_ssl.c:1007)>

Downloading https://ossci-datasets.s3.amazonaws.com/mnist/train-images-idx3-ubyte.gz
Downloading https://ossci-datasets.s3.amazonaws.com/mnist/train-images-idx3-ubyte.gz to ./data/MNIST/raw/train-images-idx3-ubyte.gz
100%|██████████| 9.91M/9.91M [00:11<00:00, 899kB/s]
Extracting ./data/MNIST/raw/train-images-idx3-ubyte.gz to ./data/MNIST/raw

Downloading http://yann.lecun.com/exdb/mnist/train-labels-idx1-ubyte.gz
Failed to download (trying next):
<urlopen error [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed: certificate has expired (_ssl.c:1007)>

Downloading https://ossci-datasets.s3.amazonaws.com/mnist/train-labels-idx1-ubyte.gz
Downloading https://ossci-datasets.s3.amazonaws.com/mnist/train-labels-idx1-ubyte.gz to ./data/MNIST/raw/train-labels-idx1-ubyte.gz
100%|██████████| 28.9k/28.9k [00:00<00:00, 135kB/s]
Extracting ./data/MNIST/raw/train-labels-idx1-ubyte.gz to ./data/MNIST/raw

Downloading http://yann.lecun.com/exdb/mnist/t10k-images-idx3-ubyte.gz
Failed to download (trying next):
<urlopen error [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed: certificate has expired (_ssl.c:1007)>

Downloading https://ossci-datasets.s3.amazonaws.com/mnist/t10k-images-idx3-ubyte.gz
Downloading https://ossci-datasets.s3.amazonaws.com/mnist/t10k-images-idx3-ubyte.gz to ./data/MNIST/raw/t10k-images-idx3-ubyte.gz
100%|██████████| 1.65M/1.65M [00:01<00:00, 1.27MB/s]
Extracting ./data/MNIST/raw/t10k-images-idx3-ubyte.gz to ./data/MNIST/raw

Downloading http://yann.lecun.com/exdb/mnist/t10k-labels-idx1-ubyte.gz
Failed to download (trying next):
<urlopen error [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed: certificate has expired (_ssl.c:1007)>

Downloading https://ossci-datasets.s3.amazonaws.com/mnist/t10k-labels-idx1-ubyte.gz
Downloading https://ossci-datasets.s3.amazonaws.com/mnist/t10k-labels-idx1-ubyte.gz to ./data/MNIST/raw/t10k-labels-idx1-ubyte.gz
100%|██████████| 4.54k/4.54k [00:00<00:00, 5.04MB/s]Extracting ./data/MNIST/raw/t10k-labels-idx1-ubyte.gz to ./data/MNIST/raw
```

```
!python main.py --dataset MNIST --method DM --ipc 10
```

```
eval_it_pool: [0, 500, 1000]

================ Exp 0 ================
```

```
Hyper-parameters:
 {'method': 'DM', 'dataset': 'MNIST', 'model': 'ConvNet', 'ipc': 10, 'eval_mode': 'S', 'num_exp': 5, 'num_eval': 20, 'epoch_eval_train': 300, 'Iteration': 1000, 'lr_img': 0.1, 'lr_net': 0.01, 'batch_real': 256, 'batch_train': 256, 'init': 'noise', 'dsa_strategy': 'None', 'data_path': 'data', 'save_path': 're
Evaluation model pool:  ['ConvNet']
class c = 0: 5923 real images
class c = 1: 6742 real images
class c = 2: 5958 real images
class c = 3: 6131 real images
class c = 4: 5842 real images
class c = 5: 5421 real images
class c = 6: 5918 real images
class c = 7: 6265 real images
class c = 8: 5851 real images
class c = 9: 5949 real images
real images channel 0, mean = -0.0001, std = 1.0000
/content/DatasetCondensation/main.py:89: UserWarning: Creating a tensor from a list of numpy.ndarrays is extremely slow. Please consider converting the list to a single numpy.ndarray with numpy.array() before converting to a tensor. (Triggered internally at ../torch/csrc/utils/tensor_new.cpp:278.)
  label_syn = torch.tensor([np.ones(args.ipc)*i for i in range(num_classes)], dtype=torch.long, requires_grad=False, device=args.device).view(-1) # [0,0,0, 1,1,1, ..., 9,9,9]
initialize synthetic data from random noise
[2024-11-03 23:23:29] training begins
-------------------------
Evaluation
model_train = ConvNet, model_eval = ConvNet, iteration = 0
DC augmentation parameters:
 {'crop': 4, 'scale': 0.2, 'rotate': 45, 'noise': 0.001, 'strategy': 'crop_scale_rotate'}
[2024-11-03 23:24:08] Evaluate_00: epoch = 1000 train time = 36 s train loss = 0.011867 train acc = 1.0000, test acc = 0.0943
[2024-11-03 23:24:46] Evaluate_01: epoch = 1000 train time = 35 s train loss = 0.015994 train acc = 1.0000, test acc = 0.1153
[2024-11-03 23:25:23] Evaluate_02: epoch = 1000 train time = 35 s train loss = 0.006754 train acc = 1.0000, test acc = 0.1453
[2024-11-03 23:26:01] Evaluate_03: epoch = 1000 train time = 35 s train loss = 0.009939 train acc = 1.0000, test acc = 0.0762
[2024-11-03 23:26:38] Evaluate_04: epoch = 1000 train time = 34 s train loss = 0.008773 train acc = 1.0000, test acc = 0.0859
[2024-11-03 23:27:15] Evaluate_05: epoch = 1000 train time = 34 s train loss = 0.009646 train acc = 1.0000, test acc = 0.0296
[2024-11-03 23:27:52] Evaluate_06: epoch = 1000 train time = 35 s train loss = 0.010515 train acc = 1.0000, test acc = 0.0811
[2024-11-03 23:28:29] Evaluate_07: epoch = 1000 train time = 34 s train loss = 0.011801 train acc = 1.0000, test acc = 0.1026
[2024-11-03 23:29:07] Evaluate_08: epoch = 1000 train time = 35 s train loss = 0.011601 train acc = 1.0000, test acc = 0.0547
[2024-11-03 23:29:44] Evaluate_09: epoch = 1000 train time = 35 s train loss = 0.007835 train acc = 1.0000, test acc = 0.0850
[2024-11-03 23:30:22] Evaluate_10: epoch = 1000 train time = 35 s train loss = 0.011320 train acc = 1.0000, test acc = 0.1140
[2024-11-03 23:30:59] Evaluate_11: epoch = 1000 train time = 35 s train loss = 0.008788 train acc = 1.0000, test acc = 0.0847
[2024-11-03 23:31:37] Evaluate_12: epoch = 1000 train time = 35 s train loss = 0.007590 train acc = 1.0000, test acc = 0.0716
[2024-11-03 23:32:14] Evaluate_13: epoch = 1000 train time = 35 s train loss = 0.010688 train acc = 1.0000, test acc = 0.0988
[2024-11-03 23:32:51] Evaluate_14: epoch = 1000 train time = 34 s train loss = 0.012900 train acc = 1.0000, test acc = 0.1350
[2024-11-03 23:33:29] Evaluate_15: epoch = 1000 train time = 35 s train loss = 0.013129 train acc = 1.0000, test acc = 0.0661
[2024-11-03 23:34:06] Evaluate_16: epoch = 1000 train time = 35 s train loss = 0.016028 train acc = 1.0000, test acc = 0.0656
[2024-11-03 23:34:44] Evaluate_17: epoch = 1000 train time = 35 s train loss = 0.012058 train acc = 1.0000, test acc = 0.0536
[2024-11-03 23:35:21] Evaluate_18: epoch = 1000 train time = 34 s train loss = 0.009164 train acc = 1.0000, test acc = 0.0657
[2024-11-03 23:35:58] Evaluate_19: epoch = 1000 train time = 35 s train loss = 0.011086 train acc = 1.0000, test acc = 0.1449
Evaluate 20 random ConvNet, mean = 0.0885 std = 0.0301
-------------------------
[2024-11-03 23:36:06] iter = 0000, loss = 218.2366
[2024-11-03 23:37:15] iter = 0010, loss = 91.7760
[2024-11-03 23:38:24] iter = 0020, loss = 72.9020
[2024-11-03 23:39:33] iter = 0030, loss = 62.8031
[2024-11-03 23:40:42] iter = 0040, loss = 53.0287
[2024-11-03 23:41:50] iter = 0050, loss = 49.4174
[2024-11-03 23:42:59] iter = 0060, loss = 45.8709
```

```
!ls  /content/
```

```
DatasetCondensation  drive  sample_data
```