

training_custom_VGGNet16

December 6, 2024

```
[1]: import argparse
import os
import time
import shutil

import torch
import torch.nn as nn
import torch.optim as optim
import torch.nn.functional as F
import torch.backends.cudnn as cudnn

import torchvision
import torchvision.transforms as transforms

from models import *    # bring everything in the folder models
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[2]: use_gpu = torch.cuda.is_available()
device = torch.device("cuda" if use_gpu else "cpu")
use_gpu, torch.cuda.get_device_name()
```

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[2]: (True, 'NVIDIA GeForce RTX 2080 Ti')
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[3]: global best_prec

batch_size = 256

print_freq = 90

model_name = "VGG16_custom1"
model = VGG16_custom()

# fdir = 'result/'+str(model_name)+'/' + 'model_best.pth.tar'
# checkpoint = torch.load(fdir)
# model.load_state_dict(checkpoint['state_dict'])
```

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[4]: model
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[4]: VGG_quant(
    (features): Sequential(
      (0): QuantConv2d(
        3, 64, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (1): BatchNorm2d(64, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
      (2): ReLU(inplace=True)
      (3): QuantConv2d(
        64, 64, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (4): BatchNorm2d(64, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
      (5): ReLU(inplace=True)
      (6): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
      (7): QuantConv2d(
        64, 128, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (8): BatchNorm2d(128, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
      (9): ReLU(inplace=True)
      (10): QuantConv2d(
        128, 128, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (11): BatchNorm2d(128, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
      (12): ReLU(inplace=True)
      (13): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
      (14): QuantConv2d(
        128, 256, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (15): BatchNorm2d(256, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
      (16): ReLU(inplace=True)
      (17): QuantConv2d(
        256, 256, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
        (weight_quant): weight_quantize_fn()
      )
      (18): BatchNorm2d(256, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)

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(19): ReLU(inplace=True)
(20): QuantConv2d(
  256, 256, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(21): BatchNorm2d(256, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
(22): ReLU(inplace=True)
(23): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
(24): QuantConv2d(
  256, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(25): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
(26): ReLU(inplace=True)
(27): QuantConv2d(
  512, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(28): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
(29): ReLU(inplace=True)
(30): QuantConv2d(
  512, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(31): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
(32): ReLU(inplace=True)
(33): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
(34): QuantConv2d(
  512, 8, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(35): BatchNorm2d(8, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
(36): ReLU(inplace=True)
(37): QuantConv2d(
  8, 8, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
  (weight_quant): weight_quantize_fn()
)
(38): ReLU(inplace=True)
(39): QuantConv2d(
  8, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False

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        (weight_quant): weight_quantize_fn()
    )
    (40): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
    (41): ReLU(inplace=True)
    (42): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
    (43): AvgPool2d(kernel_size=1, stride=1, padding=0)
)
(classifier): Linear(in_features=512, out_features=10, bias=True)
)

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[5]: # means and stds for individual RGB channels
# image = (image - mean) / std
normalize = transforms.Normalize(mean=[0.491, 0.482, 0.447], std=[0.247, 0.243,
↪0.262])

train_dataset = torchvision.datasets.CIFAR10(
    root='./data',
    train=True,
    download=True,
    transform=transforms.Compose([
        transforms.RandomCrop(32, padding=4),
        transforms.RandomHorizontalFlip(),
        transforms.ToTensor(),
        normalize,
    ]))

test_dataset = torchvision.datasets.CIFAR10(
    root='./data',
    train=False,
    download=True,
    transform=transforms.Compose([
        transforms.ToTensor(),
        normalize,
    ]))

trainloader = torch.utils.data.DataLoader(train_dataset, batch_size=batch_size,
↪shuffle=True, num_workers=2)
testloader = torch.utils.data.DataLoader(test_dataset, batch_size=batch_size,
↪shuffle=False, num_workers=2)

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Files already downloaded and verified
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```

[6]: def train(trainloader, model, criterion, optimizer, epoch):

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    batch_time = AverageMeter()    ## at the begining of each epoch, this should
    ↪ be reset
    data_time = AverageMeter()
    losses = AverageMeter()
    top1 = AverageMeter()

    model.train()

    end = time.time()    # measure current time

    for i, (input, target) in enumerate(trainloader):
        # measure data loading time
        data_time.update(time.time() - end)    # data loading time

        input, target = input.cuda(), target.cuda()

        # compute output
        output = model(input)
        loss = criterion(output, target)

        # measure accuracy and record loss
        prec = accuracy(output, target)[0]
        losses.update(loss.item(), input.size(0))
        top1.update(prec.item(), input.size(0))

        # compute gradient and do SGD step
        optimizer.zero_grad()
        loss.backward()
        optimizer.step()

        # measure elapsed time
        batch_time.update(time.time() - end)    # time spent to process one batch
        end = time.time()

    if i % print_freq == 0:
        print('Epoch: [{0}] [{1}/{2}]\t'
              'Time {batch_time.val:.3f} ({batch_time.avg:.3f})\t'
              'Data {data_time.val:.3f} ({data_time.avg:.3f})\t'
              'Loss {loss.val:.4f} ({loss.avg:.4f})\t'
              'Prec {top1.val:.3f}% ({top1.avg:.3f}%)'.format(
                epoch, i, len(trainloader), batch_time=batch_time,
                data_time=data_time, loss=losses, top1=top1))

```

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[7]: def validate(val_loader, model, criterion ):
    batch_time = AverageMeter()
    losses = AverageMeter()

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top1 = AverageMeter()

# switch to evaluate mode
model.eval()

end = time.time()
with torch.no_grad():
    for i, (input, target) in enumerate(val_loader):

        input, target = input.cuda(), target.cuda()

        # compute output
        output = model(input)
        loss = criterion(output, target)

        # measure accuracy and record loss
        prec = accuracy(output, target)[0]
        losses.update(loss.item(), input.size(0))
        top1.update(prec.item(), input.size(0))

        # measure elapsed time
        batch_time.update(time.time() - end)
        end = time.time()

    if i % print_freq == 0: # This line shows how frequently print out
        ↪ the status. e.g., i%5 => every 5 batch, prints out
        print('Test: [{0}/{1}]\t'
              'Time {batch_time.val:.3f} ({batch_time.avg:.3f})\t'
              'Loss {loss.val:.4f} ({loss.avg:.4f})\t'
              'Prec {top1.val:.3f}% ({top1.avg:.3f}%)'
              .format(i, len(val_loader), batch_time=batch_time, loss=losses,
                      top1=top1))

print(' * Prec {top1.avg:.3f}% '.format(top1=top1))
return top1.avg, losses.avg

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[8]: def accuracy(output, target, topk=(1,)):
    """Computes the precision@k for the specified values of k"""
    maxk = max(topk)
    batch_size = target.size(0)

    _, pred = output.topk(maxk, 1, True, True) # topk(k, dim=None,
    ↪ largest=True, sorted=True)
                                                # will output (max value, its
    ↪ index)
    pred = pred.t() # transpose

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    correct = pred.eq(target.view(1, -1).expand_as(pred))    # "-1": calculate_
↪automatically

    res = []
    for k in topk:
        correct_k = correct[:k].view(-1).float().sum(0)    # view(-1): make a_
↪flattened 1D tensor
        res.append(correct_k.mul_(100.0 / batch_size))    # correct: size of_
↪[maxk, batch_size]
    return res

```

```

[9]: class AverageMeter(object):
    """Computes and stores the average and current value"""
    def __init__(self):
        self.reset()

    def reset(self):
        self.val = 0
        self.avg = 0
        self.sum = 0
        self.count = 0

    def update(self, val, n=1):
        self.val = val
        self.sum += val * n    ## n is impact factor
        self.count += n
        self.avg = self.sum / self.count

```

```

[10]: def save_checkpoint(state, is_best, fdir):
    filepath = os.path.join(fdir, 'checkpoint.pth')
    torch.save(state, filepath)
    if is_best:
        shutil.copyfile(filepath, os.path.join(fdir, 'model_best.pth.tar'))

```

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[11]: def adjust_learning_rate(optimizer, epoch):
    """For resnet, the lr starts from 0.1, and is divided by 10 at 80 and 120_
↪epochs"""
    adjust_list = [120, 140]
    # adjust_list = [20, 30, 40, 50]
    if epoch in adjust_list:
        for param_group in optimizer.param_groups:
            param_group['lr'] = param_group['lr'] * 0.1

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[12]: import torch.optim.lr_scheduler as lr_scheduler
# lr = 0.01
lr = 2e-2
weight_decay = 1e-4

```

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epochs = 160
best_prec = 0

model = model.cuda()
model.eval()
criterion = nn.CrossEntropyLoss().cuda()
optimizer = torch.optim.SGD(model.parameters(), lr=lr, momentum=0.9,
    ↪weight_decay=weight_decay)
# weight decay: for regularization to prevent overfitting
lr_sched = lr_scheduler.ReduceLROnPlateau(optimizer, mode='min', factor=0.1,
    ↪patience=5, threshold=0.0001)

if not os.path.exists('result'):
    os.makedirs('result')

fdir = 'result/'+str(model_name)

if not os.path.exists(fdir):
    os.makedirs(fdir)

for epoch in range(0, epochs):
    adjust_learning_rate(optimizer, epoch)

    train(trainloader, model, criterion, optimizer, epoch)

    # evaluate on test set
    print("Validation starts")
    prec, valid_loss = validate(testloader, model, criterion)

    # remember best precision and save checkpoint
    is_best = prec > best_prec
    best_prec = max(prec, best_prec)
    print('best acc: {:.1f}'.format(best_prec))
    if prec < 88: continue
    save_checkpoint({
        'epoch': epoch + 1,
        'state_dict': model.state_dict(),
        'best_prec': best_prec,
        'optimizer': optimizer.state_dict(),
        'scheduler': lr_sched.state_dict(),
    }, is_best, fdir)

    lr_sched.step(valid_loss)

```

Epoch: [0] [0/196]

Time 3.213 (3.213)

Data 0.729 (0.729)

Loss

2.3611 (2.3611) Prec 11.719% (11.719%)
Epoch: [0] [90/196] Time 0.055 (0.092) Data 0.002 (0.011) Loss
1.7612 (1.9577) Prec 31.250% (27.155%)
Epoch: [0] [180/196] Time 0.057 (0.075) Data 0.002 (0.007) Loss
1.5662 (1.7675) Prec 41.406% (34.198%)
Validation starts
Test: [0/40] Time 0.392 (0.392) Loss 1.4695 (1.4695) Prec 46.875%
(46.875%)
* Prec 44.900%
best acc: 44.900000
Epoch: [1] [0/196] Time 0.829 (0.829) Data 0.769 (0.769) Loss
1.4003 (1.4003) Prec 51.562% (51.562%)
Epoch: [1] [90/196] Time 0.058 (0.067) Data 0.002 (0.012) Loss
1.1969 (1.3016) Prec 55.469% (53.322%)
Epoch: [1] [180/196] Time 0.058 (0.062) Data 0.003 (0.007) Loss
1.1620 (1.2224) Prec 60.547% (56.399%)
Validation starts
Test: [0/40] Time 0.358 (0.358) Loss 1.4651 (1.4651) Prec 51.172%
(51.172%)
* Prec 54.240%
best acc: 54.240000
Epoch: [2] [0/196] Time 0.943 (0.943) Data 0.890 (0.890) Loss
1.0890 (1.0890) Prec 62.500% (62.500%)
Epoch: [2] [90/196] Time 0.056 (0.067) Data 0.002 (0.012) Loss
0.9441 (1.0241) Prec 67.188% (64.269%)
Epoch: [2] [180/196] Time 0.056 (0.062) Data 0.002 (0.007) Loss
0.7670 (0.9839) Prec 73.828% (65.817%)
Validation starts
Test: [0/40] Time 0.346 (0.346) Loss 1.0468 (1.0468) Prec 66.016%
(66.016%)
* Prec 64.570%
best acc: 64.570000
Epoch: [3] [0/196] Time 1.016 (1.016) Data 0.963 (0.963) Loss
0.9687 (0.9687) Prec 68.750% (68.750%)
Epoch: [3] [90/196] Time 0.054 (0.068) Data 0.002 (0.013) Loss
0.8776 (0.8721) Prec 71.094% (69.913%)
Epoch: [3] [180/196] Time 0.059 (0.063) Data 0.002 (0.008) Loss
0.9716 (0.8506) Prec 64.844% (70.679%)
Validation starts
Test: [0/40] Time 0.420 (0.420) Loss 0.9011 (0.9011) Prec 73.047%
(73.047%)
* Prec 71.940%
best acc: 71.940000
Epoch: [4] [0/196] Time 0.832 (0.832) Data 0.779 (0.779) Loss
0.6580 (0.6580) Prec 75.391% (75.391%)
Epoch: [4] [90/196] Time 0.059 (0.066) Data 0.002 (0.011) Loss
0.8547 (0.7548) Prec 70.703% (74.356%)
Epoch: [4] [180/196] Time 0.057 (0.062) Data 0.002 (0.007) Loss

0.6528 (0.7385) Prec 74.219% (75.043%)
Validation starts
Test: [0/40] Time 0.351 (0.351) Loss 0.8923 (0.8923) Prec 71.875%
(71.875%)
* Prec 69.320%
best acc: 71.940000
Epoch: [5][0/196] Time 0.893 (0.893) Data 0.840 (0.840) Loss
0.6728 (0.6728) Prec 76.953% (76.953%)
Epoch: [5][90/196] Time 0.054 (0.067) Data 0.002 (0.012) Loss
0.6530 (0.6901) Prec 78.125% (76.932%)
Epoch: [5][180/196] Time 0.058 (0.062) Data 0.002 (0.008) Loss
0.7140 (0.6759) Prec 76.562% (77.357%)
Validation starts
Test: [0/40] Time 0.339 (0.339) Loss 0.8471 (0.8471) Prec 73.438%
(73.438%)
* Prec 73.020%
best acc: 73.020000
Epoch: [6][0/196] Time 0.910 (0.910) Data 0.858 (0.858) Loss
0.6429 (0.6429) Prec 76.562% (76.562%)
Epoch: [6][90/196] Time 0.056 (0.067) Data 0.002 (0.013) Loss
0.5932 (0.6214) Prec 81.641% (78.949%)
Epoch: [6][180/196] Time 0.056 (0.062) Data 0.002 (0.008) Loss
0.5483 (0.6045) Prec 82.422% (79.545%)
Validation starts
Test: [0/40] Time 0.363 (0.363) Loss 0.6538 (0.6538) Prec 78.906%
(78.906%)
* Prec 78.780%
best acc: 78.780000
Epoch: [7][0/196] Time 0.752 (0.752) Data 0.700 (0.700) Loss
0.4588 (0.4588) Prec 83.984% (83.984%)
Epoch: [7][90/196] Time 0.056 (0.066) Data 0.002 (0.011) Loss
0.5486 (0.5743) Prec 79.688% (80.615%)
Epoch: [7][180/196] Time 0.057 (0.062) Data 0.002 (0.007) Loss
0.5683 (0.5684) Prec 80.469% (80.792%)
Validation starts
Test: [0/40] Time 0.537 (0.537) Loss 0.4662 (0.4662) Prec 87.109%
(87.109%)
* Prec 79.970%
best acc: 79.970000
Epoch: [8][0/196] Time 0.842 (0.842) Data 0.786 (0.786) Loss
0.6014 (0.6014) Prec 78.906% (78.906%)
Epoch: [8][90/196] Time 0.055 (0.066) Data 0.002 (0.012) Loss
0.5052 (0.5442) Prec 80.859% (81.619%)
Epoch: [8][180/196] Time 0.056 (0.062) Data 0.002 (0.007) Loss
0.5457 (0.5390) Prec 78.906% (81.727%)
Validation starts
Test: [0/40] Time 0.396 (0.396) Loss 0.6837 (0.6837) Prec 78.906%
(78.906%)

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* Prec 76.430%
best acc: 79.970000
Epoch: [9][0/196]      Time 0.716 (0.716)      Data 0.665 (0.665)      Loss
0.4602 (0.4602)      Prec 84.375% (84.375%)
Epoch: [9][90/196]     Time 0.057 (0.065)      Data 0.001 (0.010)      Loss
0.4710 (0.5002)      Prec 83.984% (82.997%)
Epoch: [9][180/196]    Time 0.058 (0.062)      Data 0.002 (0.007)      Loss
0.4256 (0.5045)      Prec 86.328% (82.940%)
Validation starts
Test: [0/40]      Time 0.305 (0.305)      Loss 0.6470 (0.6470)      Prec 76.953%
(76.953%)
* Prec 78.050%
best acc: 79.970000
Epoch: [10][0/196]     Time 1.062 (1.062)      Data 1.007 (1.007)      Loss
0.5369 (0.5369)      Prec 82.422% (82.422%)
Epoch: [10][90/196]    Time 0.056 (0.069)      Data 0.002 (0.014)      Loss
0.4824 (0.4749)      Prec 82.031% (83.946%)
Epoch: [10][180/196]   Time 0.059 (0.064)      Data 0.002 (0.008)      Loss
0.4143 (0.4743)      Prec 85.938% (83.872%)
Validation starts
Test: [0/40]      Time 0.543 (0.543)      Loss 0.6603 (0.6603)      Prec 78.906%
(78.906%)
* Prec 79.750%
best acc: 79.970000
Epoch: [11][0/196]     Time 0.694 (0.694)      Data 0.641 (0.641)      Loss
0.4334 (0.4334)      Prec 85.938% (85.938%)
Epoch: [11][90/196]    Time 0.057 (0.066)      Data 0.002 (0.010)      Loss
0.4919 (0.4460)      Prec 83.984% (84.937%)
Epoch: [11][180/196]   Time 0.060 (0.063)      Data 0.002 (0.007)      Loss
0.3642 (0.4449)      Prec 87.109% (84.927%)
Validation starts
Test: [0/40]      Time 0.743 (0.743)      Loss 0.4369 (0.4369)      Prec 84.766%
(84.766%)
* Prec 82.860%
best acc: 82.860000
Epoch: [12][0/196]     Time 0.798 (0.798)      Data 0.746 (0.746)      Loss
0.3089 (0.3089)      Prec 91.797% (91.797%)
Epoch: [12][90/196]    Time 0.057 (0.066)      Data 0.002 (0.011)      Loss
0.4445 (0.4120)      Prec 85.547% (86.144%)
Epoch: [12][180/196]   Time 0.057 (0.063)      Data 0.002 (0.007)      Loss
0.3949 (0.4191)      Prec 87.500% (85.970%)
Validation starts
Test: [0/40]      Time 0.532 (0.532)      Loss 0.5107 (0.5107)      Prec 83.203%
(83.203%)
* Prec 81.030%
best acc: 82.860000
Epoch: [13][0/196]     Time 0.963 (0.963)      Data 0.910 (0.910)      Loss
0.4908 (0.4908)      Prec 83.203% (83.203%)

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Epoch: [13][90/196] Time 0.113 (0.068) Data 0.071 (0.013) Loss
 0.3045 (0.4115) Prec 87.891% (86.272%)
 Epoch: [13][180/196] Time 0.061 (0.064) Data 0.002 (0.008) Loss
 0.4309 (0.4042) Prec 85.547% (86.509%)
 Validation starts
 Test: [0/40] Time 0.415 (0.415) Loss 0.4241 (0.4241) Prec 85.156%
 (85.156%)
 * Prec 82.190%
 best acc: 82.860000
 Epoch: [14][0/196] Time 0.694 (0.694) Data 0.640 (0.640) Loss
 0.4258 (0.4258) Prec 83.984% (83.984%)
 Epoch: [14][90/196] Time 0.060 (0.066) Data 0.002 (0.010) Loss
 0.5768 (0.3860) Prec 80.859% (87.384%)
 Epoch: [14][180/196] Time 0.059 (0.063) Data 0.002 (0.007) Loss
 0.3816 (0.3832) Prec 86.719% (87.263%)
 Validation starts
 Test: [0/40] Time 0.284 (0.284) Loss 0.4859 (0.4859) Prec 82.812%
 (82.812%)
 * Prec 81.700%
 best acc: 82.860000
 Epoch: [15][0/196] Time 0.899 (0.899) Data 0.844 (0.844) Loss
 0.3686 (0.3686) Prec 87.891% (87.891%)
 Epoch: [15][90/196] Time 0.057 (0.067) Data 0.002 (0.012) Loss
 0.3859 (0.3621) Prec 88.672% (87.569%)
 Epoch: [15][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
 0.3629 (0.3697) Prec 87.109% (87.412%)
 Validation starts
 Test: [0/40] Time 0.482 (0.482) Loss 0.3467 (0.3467) Prec 88.281%
 (88.281%)
 * Prec 83.980%
 best acc: 83.980000
 Epoch: [16][0/196] Time 0.760 (0.760) Data 0.701 (0.701) Loss
 0.2579 (0.2579) Prec 92.969% (92.969%)
 Epoch: [16][90/196] Time 0.060 (0.067) Data 0.002 (0.010) Loss
 0.3835 (0.3379) Prec 87.891% (88.504%)
 Epoch: [16][180/196] Time 0.061 (0.064) Data 0.002 (0.007) Loss
 0.3026 (0.3479) Prec 89.844% (88.182%)
 Validation starts
 Test: [0/40] Time 0.333 (0.333) Loss 0.5101 (0.5101) Prec 83.594%
 (83.594%)
 * Prec 82.210%
 best acc: 83.980000
 Epoch: [17][0/196] Time 0.815 (0.815) Data 0.755 (0.755) Loss
 0.2300 (0.2300) Prec 92.969% (92.969%)
 Epoch: [17][90/196] Time 0.061 (0.069) Data 0.002 (0.012) Loss
 0.3060 (0.3249) Prec 87.500% (88.822%)
 Epoch: [17][180/196] Time 0.061 (0.065) Data 0.002 (0.007) Loss
 0.2473 (0.3292) Prec 91.797% (88.758%)

Validation starts

Test: [0/40] Time 0.452 (0.452) Loss 0.4398 (0.4398) Prec 86.719%
(86.719%)

* Prec 83.890%

best acc: 83.980000

Epoch: [18][0/196] Time 0.850 (0.850) Data 0.790 (0.790) Loss
0.3477 (0.3477) Prec 87.500% (87.500%)

Epoch: [18][90/196] Time 0.061 (0.067) Data 0.002 (0.011) Loss
0.3495 (0.3116) Prec 87.500% (89.342%)

Epoch: [18][180/196] Time 0.059 (0.063) Data 0.002 (0.007) Loss
0.2787 (0.3207) Prec 91.797% (89.108%)

Validation starts

Test: [0/40] Time 0.405 (0.405) Loss 0.4549 (0.4549) Prec 86.328%
(86.328%)

* Prec 85.750%

best acc: 85.750000

Epoch: [19][0/196] Time 1.005 (1.005) Data 0.951 (0.951) Loss
0.2709 (0.2709) Prec 90.625% (90.625%)

Epoch: [19][90/196] Time 0.058 (0.069) Data 0.002 (0.013) Loss
0.3578 (0.3022) Prec 86.719% (89.788%)

Epoch: [19][180/196] Time 0.060 (0.065) Data 0.002 (0.010) Loss
0.2396 (0.3061) Prec 91.016% (89.559%)

Validation starts

Test: [0/40] Time 0.362 (0.362) Loss 0.4249 (0.4249) Prec 87.500%
(87.500%)

* Prec 84.500%

best acc: 85.750000

Epoch: [20][0/196] Time 0.705 (0.705) Data 0.659 (0.659) Loss
0.2747 (0.2747) Prec 90.234% (90.234%)

Epoch: [20][90/196] Time 0.058 (0.066) Data 0.002 (0.011) Loss
0.2747 (0.2839) Prec 90.625% (90.406%)

Epoch: [20][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.2853 (0.2883) Prec 88.672% (90.254%)

Validation starts

Test: [0/40] Time 0.393 (0.393) Loss 0.5015 (0.5015) Prec 83.984%
(83.984%)

* Prec 84.360%

best acc: 85.750000

Epoch: [21][0/196] Time 0.892 (0.892) Data 0.841 (0.841) Loss
0.2774 (0.2774) Prec 89.453% (89.453%)

Epoch: [21][90/196] Time 0.060 (0.068) Data 0.004 (0.012) Loss
0.2038 (0.2701) Prec 92.969% (90.861%)

Epoch: [21][180/196] Time 0.060 (0.064) Data 0.002 (0.007) Loss
0.2972 (0.2799) Prec 87.891% (90.435%)

Validation starts

Test: [0/40] Time 0.323 (0.323) Loss 0.4826 (0.4826) Prec 83.203%
(83.203%)

* Prec 83.710%

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best acc: 85.750000
Epoch: [22][0/196]      Time 0.915 (0.915)      Data 0.862 (0.862)      Loss
0.1761 (0.1761)      Prec 93.750% (93.750%)
Epoch: [22][90/196]    Time 0.063 (0.068)      Data 0.002 (0.013)      Loss
0.2906 (0.2693)      Prec 89.062% (90.801%)
Epoch: [22][180/196]   Time 0.057 (0.064)      Data 0.003 (0.008)      Loss
0.2199 (0.2776)      Prec 91.797% (90.491%)
Validation starts
Test: [0/40]      Time 0.406 (0.406)      Loss 0.4369 (0.4369)      Prec 84.375%
(84.375%)
* Prec 84.840%
best acc: 85.750000
Epoch: [23][0/196]      Time 0.931 (0.931)      Data 0.878 (0.878)      Loss
0.1939 (0.1939)      Prec 92.578% (92.578%)
Epoch: [23][90/196]    Time 0.093 (0.068)      Data 0.050 (0.012)      Loss
0.2526 (0.2504)      Prec 92.188% (91.599%)
Epoch: [23][180/196]   Time 0.060 (0.064)      Data 0.002 (0.008)      Loss
0.2266 (0.2580)      Prec 92.969% (91.318%)
Validation starts
Test: [0/40]      Time 0.501 (0.501)      Loss 0.4144 (0.4144)      Prec 87.109%
(87.109%)
* Prec 84.680%
best acc: 85.750000
Epoch: [24][0/196]      Time 0.708 (0.708)      Data 0.656 (0.656)      Loss
0.2362 (0.2362)      Prec 91.797% (91.797%)
Epoch: [24][90/196]    Time 0.060 (0.066)      Data 0.002 (0.010)      Loss
0.2823 (0.2510)      Prec 88.672% (91.380%)
Epoch: [24][180/196]   Time 0.060 (0.063)      Data 0.002 (0.007)      Loss
0.3002 (0.2554)      Prec 93.750% (91.301%)
Validation starts
Test: [0/40]      Time 0.333 (0.333)      Loss 0.3688 (0.3688)      Prec 90.625%
(90.625%)
* Prec 85.920%
best acc: 85.920000
Epoch: [25][0/196]      Time 0.876 (0.876)      Data 0.821 (0.821)      Loss
0.1578 (0.1578)      Prec 94.922% (94.922%)
Epoch: [25][90/196]    Time 0.060 (0.068)      Data 0.002 (0.012)      Loss
0.2410 (0.2451)      Prec 92.969% (91.818%)
Epoch: [25][180/196]   Time 0.060 (0.064)      Data 0.002 (0.007)      Loss
0.3152 (0.2474)      Prec 89.844% (91.629%)
Validation starts
Test: [0/40]      Time 0.373 (0.373)      Loss 0.4001 (0.4001)      Prec 86.719%
(86.719%)
* Prec 84.760%
best acc: 85.920000
Epoch: [26][0/196]      Time 0.881 (0.881)      Data 0.827 (0.827)      Loss
0.2509 (0.2509)      Prec 90.234% (90.234%)
Epoch: [26][90/196]    Time 0.060 (0.068)      Data 0.002 (0.013)      Loss

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0.2027 (0.2332) Prec 94.141% (92.024%)
Epoch: [26][180/196] Time 0.058 (0.064) Data 0.002 (0.008) Loss
0.2089 (0.2360) Prec 92.578% (91.888%)
Validation starts
Test: [0/40] Time 0.554 (0.554) Loss 0.4351 (0.4351) Prec 86.328%
(86.328%)
* Prec 85.010%
best acc: 85.920000
Epoch: [27][0/196] Time 0.832 (0.832) Data 0.777 (0.777) Loss
0.2235 (0.2235) Prec 91.016% (91.016%)
Epoch: [27][90/196] Time 0.106 (0.067) Data 0.059 (0.011) Loss
0.1605 (0.2269) Prec 94.922% (92.102%)
Epoch: [27][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.2405 (0.2301) Prec 91.797% (92.015%)
Validation starts
Test: [0/40] Time 0.370 (0.370) Loss 0.4194 (0.4194) Prec 85.156%
(85.156%)
* Prec 85.340%
best acc: 85.920000
Epoch: [28][0/196] Time 0.758 (0.758) Data 0.704 (0.704) Loss
0.2148 (0.2148) Prec 92.188% (92.188%)
Epoch: [28][90/196] Time 0.060 (0.066) Data 0.002 (0.011) Loss
0.2169 (0.2166) Prec 91.406% (92.535%)
Epoch: [28][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.2202 (0.2162) Prec 91.406% (92.658%)
Validation starts
Test: [0/40] Time 0.553 (0.553) Loss 0.4959 (0.4959) Prec 84.766%
(84.766%)
* Prec 85.850%
best acc: 85.920000
Epoch: [29][0/196] Time 1.022 (1.022) Data 0.970 (0.970) Loss
0.1839 (0.1839) Prec 94.141% (94.141%)
Epoch: [29][90/196] Time 0.119 (0.069) Data 0.072 (0.014) Loss
0.1601 (0.2026) Prec 95.703% (93.316%)
Epoch: [29][180/196] Time 0.060 (0.064) Data 0.002 (0.008) Loss
0.1972 (0.2115) Prec 92.188% (92.902%)
Validation starts
Test: [0/40] Time 0.333 (0.333) Loss 0.3846 (0.3846) Prec 87.500%
(87.500%)
* Prec 86.170%
best acc: 86.170000
Epoch: [30][0/196] Time 0.682 (0.682) Data 0.628 (0.628) Loss
0.2083 (0.2083) Prec 93.750% (93.750%)
Epoch: [30][90/196] Time 0.057 (0.065) Data 0.002 (0.009) Loss
0.2914 (0.1988) Prec 91.016% (93.115%)
Epoch: [30][180/196] Time 0.059 (0.062) Data 0.002 (0.006) Loss
0.1956 (0.2056) Prec 91.406% (92.936%)
Validation starts

Test: [0/40] Time 0.524 (0.524) Loss 0.4028 (0.4028) Prec 86.328%
(86.328%)
* Prec 85.600%
best acc: 86.170000

Epoch: [31][0/196] Time 0.865 (0.865) Data 0.807 (0.807) Loss
0.1465 (0.1465) Prec 95.703% (95.703%)
Epoch: [31][90/196] Time 0.057 (0.068) Data 0.002 (0.012) Loss
0.1881 (0.1943) Prec 93.359% (93.308%)
Epoch: [31][180/196] Time 0.055 (0.064) Data 0.002 (0.008) Loss
0.1674 (0.1980) Prec 94.531% (93.185%)

Validation starts
Test: [0/40] Time 0.760 (0.760) Loss 0.4841 (0.4841) Prec 87.109%
(87.109%)
* Prec 85.640%
best acc: 86.170000

Epoch: [32][0/196] Time 1.027 (1.027) Data 0.975 (0.975) Loss
0.1628 (0.1628) Prec 92.969% (92.969%)
Epoch: [32][90/196] Time 0.061 (0.069) Data 0.002 (0.014) Loss
0.1477 (0.1799) Prec 93.750% (93.814%)
Epoch: [32][180/196] Time 0.056 (0.064) Data 0.002 (0.008) Loss
0.1515 (0.1839) Prec 93.750% (93.659%)

Validation starts
Test: [0/40] Time 0.510 (0.510) Loss 0.4742 (0.4742) Prec 86.719%
(86.719%)
* Prec 86.640%
best acc: 86.640000

Epoch: [33][0/196] Time 0.948 (0.948) Data 0.896 (0.896) Loss
0.2239 (0.2239) Prec 94.922% (94.922%)
Epoch: [33][90/196] Time 0.060 (0.068) Data 0.002 (0.012) Loss
0.1804 (0.1770) Prec 94.141% (93.844%)
Epoch: [33][180/196] Time 0.061 (0.064) Data 0.002 (0.008) Loss
0.1992 (0.1847) Prec 94.141% (93.528%)

Validation starts
Test: [0/40] Time 0.817 (0.817) Loss 0.3663 (0.3663) Prec 89.062%
(89.062%)
* Prec 86.660%
best acc: 86.660000

Epoch: [34][0/196] Time 0.722 (0.722) Data 0.667 (0.667) Loss
0.1868 (0.1868) Prec 91.797% (91.797%)
Epoch: [34][90/196] Time 0.058 (0.066) Data 0.002 (0.010) Loss
0.2300 (0.1795) Prec 92.578% (93.686%)
Epoch: [34][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.1867 (0.1788) Prec 94.531% (93.789%)

Validation starts
Test: [0/40] Time 0.648 (0.648) Loss 0.3852 (0.3852) Prec 89.062%
(89.062%)
* Prec 87.180%
best acc: 87.180000

Epoch: [35][0/196] Time 0.769 (0.769) Data 0.717 (0.717) Loss
 0.1972 (0.1972) Prec 93.750% (93.750%)
 Epoch: [35][90/196] Time 0.060 (0.067) Data 0.002 (0.012) Loss
 0.2360 (0.1801) Prec 90.625% (93.922%)
 Epoch: [35][180/196] Time 0.057 (0.064) Data 0.002 (0.009) Loss
 0.1660 (0.1789) Prec 93.359% (93.823%)
 Validation starts
 Test: [0/40] Time 0.366 (0.366) Loss 0.3895 (0.3895) Prec 89.062%
 (89.062%)
 * Prec 86.700%
 best acc: 87.180000
 Epoch: [36][0/196] Time 0.798 (0.798) Data 0.744 (0.744) Loss
 0.1831 (0.1831) Prec 93.359% (93.359%)
 Epoch: [36][90/196] Time 0.059 (0.068) Data 0.002 (0.012) Loss
 0.2022 (0.1615) Prec 95.312% (94.377%)
 Epoch: [36][180/196] Time 0.059 (0.064) Data 0.002 (0.008) Loss
 0.1943 (0.1661) Prec 94.531% (94.197%)
 Validation starts
 Test: [0/40] Time 0.415 (0.415) Loss 0.4667 (0.4667) Prec 85.547%
 (85.547%)
 * Prec 85.440%
 best acc: 87.180000
 Epoch: [37][0/196] Time 0.825 (0.825) Data 0.768 (0.768) Loss
 0.1497 (0.1497) Prec 96.094% (96.094%)
 Epoch: [37][90/196] Time 0.059 (0.068) Data 0.002 (0.013) Loss
 0.1719 (0.1572) Prec 94.922% (94.475%)
 Epoch: [37][180/196] Time 0.055 (0.063) Data 0.002 (0.008) Loss
 0.2007 (0.1608) Prec 93.359% (94.348%)
 Validation starts
 Test: [0/40] Time 0.501 (0.501) Loss 0.3151 (0.3151) Prec 88.281%
 (88.281%)
 * Prec 88.100%
 best acc: 88.100000
 Epoch: [38][0/196] Time 0.762 (0.762) Data 0.708 (0.708) Loss
 0.0983 (0.0983) Prec 96.484% (96.484%)
 Epoch: [38][90/196] Time 0.060 (0.066) Data 0.002 (0.011) Loss
 0.1523 (0.1524) Prec 94.531% (94.712%)
 Epoch: [38][180/196] Time 0.059 (0.063) Data 0.002 (0.007) Loss
 0.1398 (0.1558) Prec 95.703% (94.540%)
 Validation starts
 Test: [0/40] Time 0.362 (0.362) Loss 0.3719 (0.3719) Prec 87.500%
 (87.500%)
 * Prec 87.420%
 best acc: 88.100000
 Epoch: [39][0/196] Time 1.040 (1.040) Data 0.983 (0.983) Loss
 0.1253 (0.1253) Prec 96.484% (96.484%)
 Epoch: [39][90/196] Time 0.059 (0.070) Data 0.002 (0.015) Loss
 0.1432 (0.1372) Prec 95.312% (95.192%)

Epoch: [39][180/196] Time 0.061 (0.065) Data 0.002 (0.009) Loss
0.1615 (0.1512) Prec 95.703% (94.764%)
Validation starts
Test: [0/40] Time 0.800 (0.800) Loss 0.4210 (0.4210) Prec 88.281%
(88.281%)
* Prec 87.540%
best acc: 88.100000
Epoch: [40][0/196] Time 0.784 (0.784) Data 0.730 (0.730) Loss
0.1458 (0.1458) Prec 94.141% (94.141%)
Epoch: [40][90/196] Time 0.057 (0.068) Data 0.001 (0.013) Loss
0.1587 (0.1432) Prec 94.141% (95.046%)
Epoch: [40][180/196] Time 0.058 (0.064) Data 0.002 (0.008) Loss
0.1384 (0.1463) Prec 93.359% (94.844%)
Validation starts
Test: [0/40] Time 0.643 (0.643) Loss 0.5347 (0.5347) Prec 86.719%
(86.719%)
* Prec 87.030%
best acc: 88.100000
Epoch: [41][0/196] Time 0.749 (0.749) Data 0.696 (0.696) Loss
0.0660 (0.0660) Prec 97.656% (97.656%)
Epoch: [41][90/196] Time 0.060 (0.068) Data 0.002 (0.012) Loss
0.1138 (0.1419) Prec 95.312% (95.068%)
Epoch: [41][180/196] Time 0.060 (0.064) Data 0.002 (0.008) Loss
0.1088 (0.1433) Prec 96.094% (95.013%)
Validation starts
Test: [0/40] Time 0.413 (0.413) Loss 0.4036 (0.4036) Prec 87.891%
(87.891%)
* Prec 87.770%
best acc: 88.100000
Epoch: [42][0/196] Time 0.770 (0.770) Data 0.730 (0.730) Loss
0.0933 (0.0933) Prec 96.484% (96.484%)
Epoch: [42][90/196] Time 0.059 (0.067) Data 0.003 (0.012) Loss
0.2148 (0.1420) Prec 94.922% (95.102%)
Epoch: [42][180/196] Time 0.060 (0.064) Data 0.001 (0.007) Loss
0.1495 (0.1409) Prec 94.531% (95.136%)
Validation starts
Test: [0/40] Time 0.379 (0.379) Loss 0.4519 (0.4519) Prec 87.891%
(87.891%)
* Prec 87.630%
best acc: 88.100000
Epoch: [43][0/196] Time 0.843 (0.843) Data 0.791 (0.791) Loss
0.1188 (0.1188) Prec 94.922% (94.922%)
Epoch: [43][90/196] Time 0.060 (0.069) Data 0.002 (0.013) Loss
0.1091 (0.1366) Prec 96.484% (95.231%)
Epoch: [43][180/196] Time 0.058 (0.064) Data 0.002 (0.008) Loss
0.1555 (0.1356) Prec 95.703% (95.269%)
Validation starts
Test: [0/40] Time 0.361 (0.361) Loss 0.3249 (0.3249) Prec 88.672%

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(88.672%)
* Prec 88.060%
best acc: 88.100000
Epoch: [44][0/196]      Time 1.082 (1.082)      Data 1.029 (1.029)      Loss
0.2262 (0.2262)      Prec 93.359% (93.359%)
Epoch: [44][90/196]    Time 0.061 (0.070)      Data 0.002 (0.015)      Loss
0.1588 (0.1304)      Prec 94.922% (95.549%)
Epoch: [44][180/196]   Time 0.060 (0.065)      Data 0.002 (0.009)      Loss
0.1381 (0.1297)      Prec 96.875% (95.528%)
Validation starts
Test: [0/40]      Time 0.390 (0.390)      Loss 0.4207 (0.4207)      Prec 87.109%
(87.109%)
* Prec 86.700%
best acc: 88.100000
Epoch: [45][0/196]      Time 1.038 (1.038)      Data 0.988 (0.988)      Loss
0.1211 (0.1211)      Prec 96.875% (96.875%)
Epoch: [45][90/196]    Time 0.059 (0.070)      Data 0.002 (0.013)      Loss
0.1538 (0.1209)      Prec 93.750% (95.703%)
Epoch: [45][180/196]   Time 0.060 (0.065)      Data 0.002 (0.008)      Loss
0.0882 (0.1256)      Prec 97.266% (95.584%)
Validation starts
Test: [0/40]      Time 0.329 (0.329)      Loss 0.4938 (0.4938)      Prec 85.938%
(85.938%)
* Prec 87.740%
best acc: 88.100000
Epoch: [46][0/196]      Time 0.699 (0.699)      Data 0.643 (0.643)      Loss
0.0941 (0.0941)      Prec 96.875% (96.875%)
Epoch: [46][90/196]    Time 0.060 (0.066)      Data 0.002 (0.010)      Loss
0.0991 (0.1228)      Prec 98.047% (95.742%)
Epoch: [46][180/196]   Time 0.060 (0.063)      Data 0.002 (0.006)      Loss
0.1260 (0.1229)      Prec 94.922% (95.647%)
Validation starts
Test: [0/40]      Time 0.362 (0.362)      Loss 0.3340 (0.3340)      Prec 89.844%
(89.844%)
* Prec 88.390%
best acc: 88.390000
Epoch: [47][0/196]      Time 1.059 (1.059)      Data 1.020 (1.020)      Loss
0.1198 (0.1198)      Prec 95.703% (95.703%)
Epoch: [47][90/196]    Time 0.056 (0.069)      Data 0.002 (0.014)      Loss
0.1477 (0.1180)      Prec 94.531% (95.944%)
Epoch: [47][180/196]   Time 0.057 (0.064)      Data 0.002 (0.008)      Loss
0.1078 (0.1195)      Prec 94.922% (95.889%)
Validation starts
Test: [0/40]      Time 0.420 (0.420)      Loss 0.3687 (0.3687)      Prec 88.672%
(88.672%)
* Prec 87.670%
best acc: 88.390000
Epoch: [48][0/196]      Time 0.673 (0.673)      Data 0.620 (0.620)      Loss

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0.1186 (0.1186)    Prec 96.094% (96.094%)
Epoch: [48][90/196]    Time 0.056 (0.066)    Data 0.002 (0.010)    Loss
0.1156 (0.1222)    Prec 96.484% (95.888%)
Epoch: [48][180/196]    Time 0.060 (0.063)    Data 0.001 (0.007)    Loss
0.1729 (0.1235)    Prec 92.969% (95.688%)
Validation starts
Test: [0/40]    Time 0.316 (0.316)    Loss 0.3623 (0.3623)    Prec 87.500%
(87.500%)
* Prec 88.030%
best acc: 88.390000
Epoch: [49][0/196]    Time 0.845 (0.845)    Data 0.788 (0.788)    Loss
0.0624 (0.0624)    Prec 97.656% (97.656%)
Epoch: [49][90/196]    Time 0.059 (0.067)    Data 0.002 (0.011)    Loss
0.1172 (0.1176)    Prec 94.922% (95.901%)
Epoch: [49][180/196]    Time 0.059 (0.064)    Data 0.002 (0.007)    Loss
0.1155 (0.1188)    Prec 95.703% (95.783%)
Validation starts
Test: [0/40]    Time 0.373 (0.373)    Loss 0.3499 (0.3499)    Prec 89.844%
(89.844%)
* Prec 89.010%
best acc: 89.010000
Epoch: [50][0/196]    Time 0.692 (0.692)    Data 0.640 (0.640)    Loss
0.1181 (0.1181)    Prec 95.703% (95.703%)
Epoch: [50][90/196]    Time 0.058 (0.066)    Data 0.002 (0.011)    Loss
0.0703 (0.1109)    Prec 98.047% (96.064%)
Epoch: [50][180/196]    Time 0.060 (0.063)    Data 0.002 (0.007)    Loss
0.1298 (0.1114)    Prec 96.094% (96.083%)
Validation starts
Test: [0/40]    Time 0.387 (0.387)    Loss 0.4477 (0.4477)    Prec 87.891%
(87.891%)
* Prec 87.610%
best acc: 89.010000
Epoch: [51][0/196]    Time 0.803 (0.803)    Data 0.750 (0.750)    Loss
0.1514 (0.1514)    Prec 93.750% (93.750%)
Epoch: [51][90/196]    Time 0.060 (0.067)    Data 0.002 (0.011)    Loss
0.0969 (0.1112)    Prec 97.266% (96.085%)
Epoch: [51][180/196]    Time 0.061 (0.063)    Data 0.002 (0.007)    Loss
0.1104 (0.1130)    Prec 95.703% (96.042%)
Validation starts
Test: [0/40]    Time 0.329 (0.329)    Loss 0.4699 (0.4699)    Prec 88.281%
(88.281%)
* Prec 87.340%
best acc: 89.010000
Epoch: [52][0/196]    Time 0.840 (0.840)    Data 0.788 (0.788)    Loss
0.0498 (0.0498)    Prec 98.438% (98.438%)
Epoch: [52][90/196]    Time 0.059 (0.067)    Data 0.002 (0.012)    Loss
0.0812 (0.1048)    Prec 96.875% (96.416%)
Epoch: [52][180/196]    Time 0.059 (0.064)    Data 0.002 (0.007)    Loss

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0.1340 (0.1091) Prec 94.141% (96.230%)
Validation starts
Test: [0/40] Time 0.351 (0.351) Loss 0.4490 (0.4490) Prec 87.109%
(87.109%)
* Prec 88.300%
best acc: 89.010000
Epoch: [53][0/196] Time 0.732 (0.732) Data 0.677 (0.677) Loss
0.1221 (0.1221) Prec 95.703% (95.703%)
Epoch: [53][90/196] Time 0.057 (0.066) Data 0.001 (0.010) Loss
0.0970 (0.0994) Prec 96.094% (96.544%)
Epoch: [53][180/196] Time 0.059 (0.063) Data 0.002 (0.007) Loss
0.0912 (0.1052) Prec 97.656% (96.405%)
Validation starts
Test: [0/40] Time 0.356 (0.356) Loss 0.4418 (0.4418) Prec 88.672%
(88.672%)
* Prec 88.330%
best acc: 89.010000
Epoch: [54][0/196] Time 0.777 (0.777) Data 0.724 (0.724) Loss
0.0662 (0.0662) Prec 97.656% (97.656%)
Epoch: [54][90/196] Time 0.061 (0.067) Data 0.002 (0.011) Loss
0.1126 (0.0960) Prec 96.094% (96.695%)
Epoch: [54][180/196] Time 0.056 (0.063) Data 0.002 (0.007) Loss
0.1042 (0.0954) Prec 96.094% (96.707%)
Validation starts
Test: [0/40] Time 0.385 (0.385) Loss 0.4458 (0.4458) Prec 90.625%
(90.625%)
* Prec 88.120%
best acc: 89.010000
Epoch: [55][0/196] Time 0.716 (0.716) Data 0.662 (0.662) Loss
0.0794 (0.0794) Prec 97.656% (97.656%)
Epoch: [55][90/196] Time 0.057 (0.066) Data 0.002 (0.010) Loss
0.1153 (0.1051) Prec 95.703% (96.338%)
Epoch: [55][180/196] Time 0.056 (0.063) Data 0.002 (0.007) Loss
0.1944 (0.1042) Prec 93.359% (96.361%)
Validation starts
Test: [0/40] Time 0.296 (0.296) Loss 0.3634 (0.3634) Prec 89.844%
(89.844%)
* Prec 88.900%
best acc: 89.010000
Epoch: [56][0/196] Time 0.854 (0.854) Data 0.790 (0.790) Loss
0.0584 (0.0584) Prec 97.656% (97.656%)
Epoch: [56][90/196] Time 0.057 (0.067) Data 0.002 (0.011) Loss
0.0410 (0.0920) Prec 98.828% (96.716%)
Epoch: [56][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.1449 (0.0968) Prec 97.266% (96.640%)
Validation starts
Test: [0/40] Time 0.681 (0.681) Loss 0.4678 (0.4678) Prec 86.719%
(86.719%)

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* Prec 87.740%
best acc: 89.010000
Epoch: [57][0/196]      Time 0.790 (0.790)      Data 0.736 (0.736)      Loss
0.0664 (0.0664)      Prec 96.875% (96.875%)
Epoch: [57][90/196]    Time 0.060 (0.067)      Data 0.002 (0.011)      Loss
0.0948 (0.0881)      Prec 95.703% (96.823%)
Epoch: [57][180/196]   Time 0.058 (0.063)      Data 0.002 (0.007)      Loss
0.0839 (0.0949)      Prec 97.266% (96.635%)
Validation starts
Test: [0/40]      Time 0.334 (0.334)      Loss 0.4523 (0.4523)      Prec 89.453%
(89.453%)
* Prec 88.570%
best acc: 89.010000
Epoch: [58][0/196]      Time 0.953 (0.953)      Data 0.900 (0.900)      Loss
0.1007 (0.1007)      Prec 97.656% (97.656%)
Epoch: [58][90/196]    Time 0.064 (0.068)      Data 0.017 (0.013)      Loss
0.0516 (0.0855)      Prec 98.047% (97.017%)
Epoch: [58][180/196]   Time 0.054 (0.064)      Data 0.002 (0.008)      Loss
0.1303 (0.0896)      Prec 95.703% (96.866%)
Validation starts
Test: [0/40]      Time 0.338 (0.338)      Loss 0.3578 (0.3578)      Prec 91.406%
(91.406%)
* Prec 88.890%
best acc: 89.010000
Epoch: [59][0/196]      Time 0.753 (0.753)      Data 0.701 (0.701)      Loss
0.0519 (0.0519)      Prec 98.438% (98.438%)
Epoch: [59][90/196]    Time 0.058 (0.066)      Data 0.002 (0.011)      Loss
0.0721 (0.0592)      Prec 98.047% (97.995%)
Epoch: [59][180/196]   Time 0.060 (0.063)      Data 0.002 (0.007)      Loss
0.0393 (0.0531)      Prec 97.656% (98.198%)
Validation starts
Test: [0/40]      Time 0.379 (0.379)      Loss 0.3428 (0.3428)      Prec 91.406%
(91.406%)
* Prec 90.570%
best acc: 90.570000
Epoch: [60][0/196]      Time 0.774 (0.774)      Data 0.720 (0.720)      Loss
0.0508 (0.0508)      Prec 98.047% (98.047%)
Epoch: [60][90/196]    Time 0.053 (0.066)      Data 0.002 (0.011)      Loss
0.0242 (0.0368)      Prec 99.609% (98.768%)
Epoch: [60][180/196]   Time 0.057 (0.063)      Data 0.002 (0.007)      Loss
0.0433 (0.0357)      Prec 98.828% (98.837%)
Validation starts
Test: [0/40]      Time 0.603 (0.603)      Loss 0.3686 (0.3686)      Prec 91.406%
(91.406%)
* Prec 90.860%
best acc: 90.860000
Epoch: [61][0/196]      Time 0.719 (0.719)      Data 0.666 (0.666)      Loss
0.0367 (0.0367)      Prec 98.438% (98.438%)

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Epoch: [61][90/196] Time 0.058 (0.065) Data 0.002 (0.010) Loss
0.0444 (0.0338) Prec 98.828% (98.931%)

Epoch: [61][180/196] Time 0.056 (0.063) Data 0.002 (0.007) Loss
0.0159 (0.0333) Prec 99.219% (98.936%)

Validation starts
Test: [0/40] Time 0.440 (0.440) Loss 0.3962 (0.3962) Prec 91.406%
(91.406%)
* Prec 90.930%
best acc: 90.930000

Epoch: [62][0/196] Time 0.716 (0.716) Data 0.663 (0.663) Loss
0.0240 (0.0240) Prec 98.828% (98.828%)

Epoch: [62][90/196] Time 0.061 (0.065) Data 0.002 (0.010) Loss
0.0647 (0.0285) Prec 98.047% (99.064%)

Epoch: [62][180/196] Time 0.060 (0.062) Data 0.002 (0.007) Loss
0.0508 (0.0306) Prec 97.656% (99.007%)

Validation starts
Test: [0/40] Time 0.303 (0.303) Loss 0.3178 (0.3178) Prec 92.969%
(92.969%)
* Prec 91.220%
best acc: 91.220000

Epoch: [63][0/196] Time 0.876 (0.876) Data 0.823 (0.823) Loss
0.0300 (0.0300) Prec 98.828% (98.828%)

Epoch: [63][90/196] Time 0.059 (0.067) Data 0.002 (0.012) Loss
0.0377 (0.0275) Prec 98.828% (99.111%)

Epoch: [63][180/196] Time 0.057 (0.063) Data 0.002 (0.007) Loss
0.0178 (0.0277) Prec 99.609% (99.096%)

Validation starts
Test: [0/40] Time 0.638 (0.638) Loss 0.3265 (0.3265) Prec 91.797%
(91.797%)
* Prec 91.210%
best acc: 91.220000

Epoch: [64][0/196] Time 0.785 (0.785) Data 0.734 (0.734) Loss
0.0355 (0.0355) Prec 98.438% (98.438%)

Epoch: [64][90/196] Time 0.056 (0.066) Data 0.002 (0.011) Loss
0.0256 (0.0251) Prec 98.828% (99.172%)

Epoch: [64][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0297 (0.0253) Prec 98.828% (99.148%)

Validation starts
Test: [0/40] Time 0.382 (0.382) Loss 0.3623 (0.3623) Prec 91.797%
(91.797%)
* Prec 91.090%
best acc: 91.220000

Epoch: [65][0/196] Time 0.992 (0.992) Data 0.939 (0.939) Loss
0.0222 (0.0222) Prec 99.219% (99.219%)

Epoch: [65][90/196] Time 0.058 (0.069) Data 0.002 (0.013) Loss
0.0145 (0.0242) Prec 99.609% (99.223%)

Epoch: [65][180/196] Time 0.059 (0.065) Data 0.002 (0.009) Loss
0.0428 (0.0255) Prec 98.438% (99.182%)

Validation starts

Test: [0/40] Time 0.403 (0.403) Loss 0.3505 (0.3505) Prec 92.578%
(92.578%)

* Prec 91.240%

best acc: 91.240000

Epoch: [66][0/196] Time 1.068 (1.068) Data 1.016 (1.016) Loss
0.0227 (0.0227) Prec 99.609% (99.609%)

Epoch: [66][90/196] Time 0.059 (0.070) Data 0.002 (0.014) Loss
0.0083 (0.0245) Prec 100.000% (99.167%)

Epoch: [66][180/196] Time 0.060 (0.065) Data 0.002 (0.009) Loss
0.0267 (0.0238) Prec 99.219% (99.204%)

Validation starts

Test: [0/40] Time 0.614 (0.614) Loss 0.3167 (0.3167) Prec 92.578%
(92.578%)

* Prec 91.310%

best acc: 91.310000

Epoch: [67][0/196] Time 0.738 (0.738) Data 0.683 (0.683) Loss
0.0065 (0.0065) Prec 100.000% (100.000%)

Epoch: [67][90/196] Time 0.062 (0.067) Data 0.002 (0.011) Loss
0.0292 (0.0239) Prec 98.438% (99.240%)

Epoch: [67][180/196] Time 0.056 (0.063) Data 0.002 (0.007) Loss
0.0184 (0.0226) Prec 99.609% (99.247%)

Validation starts

Test: [0/40] Time 0.652 (0.652) Loss 0.3952 (0.3952) Prec 91.406%
(91.406%)

* Prec 91.320%

best acc: 91.320000

Epoch: [68][0/196] Time 0.884 (0.884) Data 0.831 (0.831) Loss
0.0174 (0.0174) Prec 99.219% (99.219%)

Epoch: [68][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0241 (0.0209) Prec 98.828% (99.313%)

Epoch: [68][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.0078 (0.0213) Prec 100.000% (99.275%)

Validation starts

Test: [0/40] Time 0.351 (0.351) Loss 0.3905 (0.3905) Prec 92.188%
(92.188%)

* Prec 91.390%

best acc: 91.390000

Epoch: [69][0/196] Time 0.704 (0.704) Data 0.650 (0.650) Loss
0.0061 (0.0061) Prec 100.000% (100.000%)

Epoch: [69][90/196] Time 0.062 (0.066) Data 0.002 (0.011) Loss
0.0189 (0.0225) Prec 99.219% (99.292%)

Epoch: [69][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.0403 (0.0216) Prec 98.438% (99.309%)

Validation starts

Test: [0/40] Time 0.423 (0.423) Loss 0.3505 (0.3505) Prec 91.797%
(91.797%)

* Prec 91.240%


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best acc: 91.390000
Epoch: [70][0/196]      Time 0.837 (0.837)      Data 0.779 (0.779)      Loss
0.0113 (0.0113)      Prec 100.000% (100.000%)
Epoch: [70][90/196]      Time 0.059 (0.067)      Data 0.007 (0.012)      Loss
0.0180 (0.0220)      Prec 99.609% (99.283%)
Epoch: [70][180/196]      Time 0.056 (0.064)      Data 0.002 (0.007)      Loss
0.0253 (0.0221)      Prec 99.219% (99.292%)
Validation starts
Test: [0/40]      Time 0.459 (0.459)      Loss 0.3690 (0.3690)      Prec 92.188%
(92.188%)
* Prec 91.320%
best acc: 91.390000
Epoch: [71][0/196]      Time 0.900 (0.900)      Data 0.846 (0.846)      Loss
0.0316 (0.0316)      Prec 98.438% (98.438%)
Epoch: [71][90/196]      Time 0.053 (0.068)      Data 0.002 (0.012)      Loss
0.0082 (0.0208)      Prec 100.000% (99.296%)
Epoch: [71][180/196]      Time 0.060 (0.064)      Data 0.002 (0.008)      Loss
0.0163 (0.0214)      Prec 99.219% (99.281%)
Validation starts
Test: [0/40]      Time 0.311 (0.311)      Loss 0.3663 (0.3663)      Prec 92.578%
(92.578%)
* Prec 91.300%
best acc: 91.390000
Epoch: [72][0/196]      Time 0.819 (0.819)      Data 0.758 (0.758)      Loss
0.0376 (0.0376)      Prec 98.828% (98.828%)
Epoch: [72][90/196]      Time 0.060 (0.067)      Data 0.002 (0.011)      Loss
0.0496 (0.0213)      Prec 98.828% (99.330%)
Epoch: [72][180/196]      Time 0.059 (0.064)      Data 0.002 (0.007)      Loss
0.0158 (0.0223)      Prec 99.609% (99.281%)
Validation starts
Test: [0/40]      Time 0.520 (0.520)      Loss 0.3288 (0.3288)      Prec 93.359%
(93.359%)
* Prec 91.320%
best acc: 91.390000
Epoch: [73][0/196]      Time 0.967 (0.967)      Data 0.912 (0.912)      Loss
0.0131 (0.0131)      Prec 99.609% (99.609%)
Epoch: [73][90/196]      Time 0.060 (0.068)      Data 0.002 (0.013)      Loss
0.0143 (0.0198)      Prec 99.609% (99.382%)
Epoch: [73][180/196]      Time 0.062 (0.064)      Data 0.002 (0.008)      Loss
0.0347 (0.0208)      Prec 98.047% (99.316%)
Validation starts
Test: [0/40]      Time 0.385 (0.385)      Loss 0.3507 (0.3507)      Prec 91.406%
(91.406%)
* Prec 91.060%
best acc: 91.390000
Epoch: [74][0/196]      Time 0.630 (0.630)      Data 0.574 (0.574)      Loss
0.0122 (0.0122)      Prec 99.219% (99.219%)
Epoch: [74][90/196]      Time 0.057 (0.065)      Data 0.002 (0.009)      Loss

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0.0241 (0.0206) Prec 98.828% (99.339%)
 Epoch: [74][180/196] Time 0.057 (0.062) Data 0.002 (0.006) Loss
 0.0066 (0.0214) Prec 99.609% (99.309%)
 Validation starts
 Test: [0/40] Time 0.486 (0.486) Loss 0.3845 (0.3845) Prec 91.406%
 (91.406%)
 * Prec 91.270%
 best acc: 91.390000
 Epoch: [75][0/196] Time 0.847 (0.847) Data 0.791 (0.791) Loss
 0.0180 (0.0180) Prec 99.609% (99.609%)
 Epoch: [75][90/196] Time 0.056 (0.067) Data 0.002 (0.011) Loss
 0.0082 (0.0223) Prec 100.000% (99.326%)
 Epoch: [75][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
 0.0098 (0.0219) Prec 99.609% (99.331%)
 Validation starts
 Test: [0/40] Time 0.420 (0.420) Loss 0.3276 (0.3276) Prec 92.188%
 (92.188%)
 * Prec 91.260%
 best acc: 91.390000
 Epoch: [76][0/196] Time 0.861 (0.861) Data 0.807 (0.807) Loss
 0.0208 (0.0208) Prec 99.609% (99.609%)
 Epoch: [76][90/196] Time 0.055 (0.067) Data 0.002 (0.012) Loss
 0.0138 (0.0227) Prec 99.219% (99.313%)
 Epoch: [76][180/196] Time 0.060 (0.063) Data 0.002 (0.008) Loss
 0.0101 (0.0213) Prec 99.609% (99.355%)
 Validation starts
 Test: [0/40] Time 0.639 (0.639) Loss 0.3502 (0.3502) Prec 90.625%
 (90.625%)
 * Prec 91.270%
 best acc: 91.390000
 Epoch: [77][0/196] Time 0.857 (0.857) Data 0.802 (0.802) Loss
 0.0151 (0.0151) Prec 99.219% (99.219%)
 Epoch: [77][90/196] Time 0.056 (0.068) Data 0.002 (0.012) Loss
 0.0248 (0.0239) Prec 99.609% (99.223%)
 Epoch: [77][180/196] Time 0.061 (0.064) Data 0.002 (0.008) Loss
 0.0094 (0.0224) Prec 99.609% (99.242%)
 Validation starts
 Test: [0/40] Time 0.355 (0.355) Loss 0.3498 (0.3498) Prec 91.016%
 (91.016%)
 * Prec 91.250%
 best acc: 91.390000
 Epoch: [78][0/196] Time 0.880 (0.880) Data 0.826 (0.826) Loss
 0.0376 (0.0376) Prec 98.438% (98.438%)
 Epoch: [78][90/196] Time 0.058 (0.067) Data 0.002 (0.011) Loss
 0.0221 (0.0212) Prec 99.609% (99.335%)
 Epoch: [78][180/196] Time 0.056 (0.063) Data 0.002 (0.007) Loss
 0.0066 (0.0206) Prec 100.000% (99.337%)
 Validation starts

Test: [0/40] Time 0.575 (0.575) Loss 0.3986 (0.3986) Prec 91.406%
(91.406%)
* Prec 90.880%
best acc: 91.390000

Epoch: [79][0/196]	Time 0.732 (0.732)	Data 0.678 (0.678)	Loss
0.0300 (0.0300)	Prec 98.828% (98.828%)		
Epoch: [79][90/196]	Time 0.059 (0.066)	Data 0.002 (0.011)	Loss
0.0269 (0.0202)	Prec 99.219% (99.378%)		
Epoch: [79][180/196]	Time 0.055 (0.063)	Data 0.002 (0.007)	Loss
0.0185 (0.0212)	Prec 99.219% (99.327%)		

Validation starts

Test: [0/40] Time 0.416 (0.416) Loss 0.3356 (0.3356) Prec 91.797%
(91.797%)
* Prec 91.120%
best acc: 91.390000

Epoch: [80][0/196]	Time 0.796 (0.796)	Data 0.743 (0.743)	Loss
0.0088 (0.0088)	Prec 100.000% (100.000%)		
Epoch: [80][90/196]	Time 0.061 (0.067)	Data 0.002 (0.011)	Loss
0.0142 (0.0215)	Prec 99.609% (99.365%)		
Epoch: [80][180/196]	Time 0.057 (0.063)	Data 0.002 (0.007)	Loss
0.0149 (0.0221)	Prec 99.219% (99.290%)		

Validation starts

Test: [0/40] Time 0.505 (0.505) Loss 0.3561 (0.3561) Prec 92.188%
(92.188%)
* Prec 91.040%
best acc: 91.390000

Epoch: [81][0/196]	Time 0.736 (0.736)	Data 0.683 (0.683)	Loss
0.0394 (0.0394)	Prec 98.438% (98.438%)		
Epoch: [81][90/196]	Time 0.059 (0.066)	Data 0.002 (0.010)	Loss
0.0373 (0.0205)	Prec 98.828% (99.365%)		
Epoch: [81][180/196]	Time 0.058 (0.063)	Data 0.002 (0.007)	Loss
0.0356 (0.0215)	Prec 98.047% (99.288%)		

Validation starts

Test: [0/40] Time 0.287 (0.287) Loss 0.3461 (0.3461) Prec 91.406%
(91.406%)
* Prec 91.240%
best acc: 91.390000

Epoch: [82][0/196]	Time 0.781 (0.781)	Data 0.728 (0.728)	Loss
0.0142 (0.0142)	Prec 99.219% (99.219%)		
Epoch: [82][90/196]	Time 0.056 (0.067)	Data 0.002 (0.011)	Loss
0.0226 (0.0195)	Prec 99.219% (99.365%)		
Epoch: [82][180/196]	Time 0.062 (0.063)	Data 0.002 (0.007)	Loss
0.0148 (0.0204)	Prec 99.219% (99.333%)		

Validation starts

Test: [0/40] Time 0.382 (0.382) Loss 0.3460 (0.3460) Prec 92.188%
(92.188%)
* Prec 91.240%
best acc: 91.390000

Epoch: [83][0/196] Time 0.758 (0.758) Data 0.704 (0.704) Loss
0.0272 (0.0272) Prec 99.219% (99.219%)

Epoch: [83][90/196] Time 0.062 (0.067) Data 0.002 (0.012) Loss
0.0148 (0.0184) Prec 99.609% (99.459%)

Epoch: [83][180/196] Time 0.054 (0.064) Data 0.002 (0.008) Loss
0.0207 (0.0196) Prec 99.219% (99.391%)

Validation starts

Test: [0/40] Time 0.453 (0.453) Loss 0.3579 (0.3579) Prec 91.797%
(91.797%)

* Prec 91.280%

best acc: 91.390000

Epoch: [84][0/196] Time 1.063 (1.063) Data 1.003 (1.003) Loss
0.0293 (0.0293) Prec 98.438% (98.438%)

Epoch: [84][90/196] Time 0.057 (0.070) Data 0.002 (0.014) Loss
0.0349 (0.0201) Prec 98.828% (99.382%)

Epoch: [84][180/196] Time 0.055 (0.065) Data 0.002 (0.009) Loss
0.0232 (0.0206) Prec 99.219% (99.346%)

Validation starts

Test: [0/40] Time 0.512 (0.512) Loss 0.3511 (0.3511) Prec 91.406%
(91.406%)

* Prec 91.300%

best acc: 91.390000

Epoch: [85][0/196] Time 0.817 (0.817) Data 0.761 (0.761) Loss
0.0180 (0.0180) Prec 99.219% (99.219%)

Epoch: [85][90/196] Time 0.112 (0.067) Data 0.070 (0.011) Loss
0.0106 (0.0206) Prec 99.609% (99.369%)

Epoch: [85][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
0.0163 (0.0206) Prec 99.609% (99.370%)

Validation starts

Test: [0/40] Time 0.629 (0.629) Loss 0.3398 (0.3398) Prec 92.578%
(92.578%)

* Prec 91.190%

best acc: 91.390000

Epoch: [86][0/196] Time 0.825 (0.825) Data 0.772 (0.772) Loss
0.0184 (0.0184) Prec 98.828% (98.828%)

Epoch: [86][90/196] Time 0.059 (0.067) Data 0.002 (0.012) Loss
0.0419 (0.0196) Prec 98.438% (99.343%)

Epoch: [86][180/196] Time 0.058 (0.063) Data 0.002 (0.008) Loss
0.0092 (0.0202) Prec 100.000% (99.305%)

Validation starts

Test: [0/40] Time 0.393 (0.393) Loss 0.3776 (0.3776) Prec 91.406%
(91.406%)

* Prec 91.170%

best acc: 91.390000

Epoch: [87][0/196] Time 0.784 (0.784) Data 0.729 (0.729) Loss
0.0258 (0.0258) Prec 98.828% (98.828%)

Epoch: [87][90/196] Time 0.060 (0.067) Data 0.002 (0.012) Loss
0.0232 (0.0194) Prec 99.219% (99.382%)

Epoch: [87][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0096 (0.0193) Prec 100.000% (99.372%)
Validation starts
Test: [0/40] Time 0.337 (0.337) Loss 0.3170 (0.3170) Prec 93.359%
(93.359%)
* Prec 91.520%
best acc: 91.520000

Epoch: [88][0/196] Time 0.906 (0.906) Data 0.853 (0.853) Loss
0.0138 (0.0138) Prec 99.219% (99.219%)
Epoch: [88][90/196] Time 0.059 (0.068) Data 0.002 (0.012) Loss
0.0192 (0.0204) Prec 99.219% (99.343%)
Epoch: [88][180/196] Time 0.059 (0.064) Data 0.002 (0.008) Loss
0.0256 (0.0205) Prec 99.219% (99.331%)
Validation starts
Test: [0/40] Time 0.485 (0.485) Loss 0.3532 (0.3532) Prec 91.016%
(91.016%)
* Prec 91.230%
best acc: 91.520000

Epoch: [89][0/196] Time 1.008 (1.008) Data 0.954 (0.954) Loss
0.0055 (0.0055) Prec 100.000% (100.000%)
Epoch: [89][90/196] Time 0.091 (0.069) Data 0.044 (0.013) Loss
0.0268 (0.0200) Prec 99.219% (99.365%)
Epoch: [89][180/196] Time 0.061 (0.064) Data 0.002 (0.008) Loss
0.0257 (0.0208) Prec 98.828% (99.294%)
Validation starts
Test: [0/40] Time 0.341 (0.341) Loss 0.3896 (0.3896) Prec 91.016%
(91.016%)
* Prec 91.150%
best acc: 91.520000

Epoch: [90][0/196] Time 0.818 (0.818) Data 0.763 (0.763) Loss
0.0330 (0.0330) Prec 98.828% (98.828%)
Epoch: [90][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0085 (0.0199) Prec 100.000% (99.378%)
Epoch: [90][180/196] Time 0.057 (0.063) Data 0.002 (0.007) Loss
0.0028 (0.0196) Prec 100.000% (99.389%)
Validation starts
Test: [0/40] Time 0.283 (0.283) Loss 0.3695 (0.3695) Prec 91.797%
(91.797%)
* Prec 91.350%
best acc: 91.520000

Epoch: [91][0/196] Time 0.787 (0.787) Data 0.737 (0.737) Loss
0.0169 (0.0169) Prec 99.219% (99.219%)
Epoch: [91][90/196] Time 0.056 (0.066) Data 0.002 (0.011) Loss
0.0388 (0.0221) Prec 98.828% (99.322%)
Epoch: [91][180/196] Time 0.057 (0.063) Data 0.002 (0.007) Loss
0.0124 (0.0222) Prec 99.609% (99.309%)
Validation starts
Test: [0/40] Time 0.327 (0.327) Loss 0.3945 (0.3945) Prec 92.188%

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(92.188%)
* Prec 91.340%
best acc: 91.520000
Epoch: [92][0/196]      Time 1.055 (1.055)      Data 0.997 (0.997)      Loss
0.0196 (0.0196)      Prec 100.000% (100.000%)
Epoch: [92][90/196]      Time 0.055 (0.070)      Data 0.003 (0.014)      Loss
0.0219 (0.0213)      Prec 99.219% (99.313%)
Epoch: [92][180/196]      Time 0.061 (0.064)      Data 0.002 (0.008)      Loss
0.0412 (0.0206)      Prec 98.438% (99.340%)
Validation starts
Test: [0/40]      Time 0.871 (0.871)      Loss 0.3336 (0.3336)      Prec 92.969%
(92.969%)
* Prec 91.320%
best acc: 91.520000
Epoch: [93][0/196]      Time 0.765 (0.765)      Data 0.708 (0.708)      Loss
0.0207 (0.0207)      Prec 99.219% (99.219%)
Epoch: [93][90/196]      Time 0.059 (0.066)      Data 0.002 (0.011)      Loss
0.0235 (0.0204)      Prec 99.219% (99.339%)
Epoch: [93][180/196]      Time 0.058 (0.063)      Data 0.002 (0.007)      Loss
0.0331 (0.0215)      Prec 98.828% (99.292%)
Validation starts
Test: [0/40]      Time 0.440 (0.440)      Loss 0.3320 (0.3320)      Prec 92.969%
(92.969%)
* Prec 91.240%
best acc: 91.520000
Epoch: [94][0/196]      Time 0.720 (0.720)      Data 0.666 (0.666)      Loss
0.0157 (0.0157)      Prec 99.609% (99.609%)
Epoch: [94][90/196]      Time 0.059 (0.066)      Data 0.002 (0.011)      Loss
0.0188 (0.0213)      Prec 99.609% (99.292%)
Epoch: [94][180/196]      Time 0.063 (0.063)      Data 0.002 (0.007)      Loss
0.0173 (0.0217)      Prec 99.219% (99.279%)
Validation starts
Test: [0/40]      Time 0.396 (0.396)      Loss 0.3621 (0.3621)      Prec 91.406%
(91.406%)
* Prec 91.300%
best acc: 91.520000
Epoch: [95][0/196]      Time 0.765 (0.765)      Data 0.711 (0.711)      Loss
0.0253 (0.0253)      Prec 99.219% (99.219%)
Epoch: [95][90/196]      Time 0.059 (0.066)      Data 0.002 (0.010)      Loss
0.0440 (0.0204)      Prec 98.828% (99.300%)
Epoch: [95][180/196]      Time 0.060 (0.063)      Data 0.002 (0.006)      Loss
0.0153 (0.0192)      Prec 99.609% (99.355%)
Validation starts
Test: [0/40]      Time 0.489 (0.489)      Loss 0.3752 (0.3752)      Prec 92.578%
(92.578%)
* Prec 91.150%
best acc: 91.520000
Epoch: [96][0/196]      Time 1.116 (1.116)      Data 1.062 (1.062)      Loss

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0.0145 (0.0145)    Prec 98.828% (98.828%)
Epoch: [96][90/196]    Time 0.086 (0.070)    Data 0.041 (0.015)    Loss
0.0374 (0.0218)    Prec 99.219% (99.236%)
Epoch: [96][180/196]    Time 0.058 (0.065)    Data 0.001 (0.009)    Loss
0.0278 (0.0225)    Prec 98.828% (99.230%)
Validation starts
Test: [0/40]    Time 0.746 (0.746)    Loss 0.3558 (0.3558)    Prec 91.797%
(91.797%)
* Prec 91.210%
best acc: 91.520000
Epoch: [97][0/196]    Time 0.840 (0.840)    Data 0.784 (0.784)    Loss
0.0102 (0.0102)    Prec 100.000% (100.000%)
Epoch: [97][90/196]    Time 0.054 (0.067)    Data 0.002 (0.012)    Loss
0.0330 (0.0221)    Prec 98.828% (99.257%)
Epoch: [97][180/196]    Time 0.061 (0.063)    Data 0.002 (0.008)    Loss
0.0325 (0.0214)    Prec 98.438% (99.307%)
Validation starts
Test: [0/40]    Time 0.615 (0.615)    Loss 0.3479 (0.3479)    Prec 92.188%
(92.188%)
* Prec 91.220%
best acc: 91.520000
Epoch: [98][0/196]    Time 0.847 (0.847)    Data 0.793 (0.793)    Loss
0.0151 (0.0151)    Prec 99.609% (99.609%)
Epoch: [98][90/196]    Time 0.057 (0.068)    Data 0.002 (0.012)    Loss
0.0088 (0.0206)    Prec 100.000% (99.373%)
Epoch: [98][180/196]    Time 0.058 (0.064)    Data 0.002 (0.007)    Loss
0.0124 (0.0213)    Prec 99.609% (99.301%)
Validation starts
Test: [0/40]    Time 0.458 (0.458)    Loss 0.3468 (0.3468)    Prec 91.016%
(91.016%)
* Prec 91.180%
best acc: 91.520000
Epoch: [99][0/196]    Time 0.767 (0.767)    Data 0.712 (0.712)    Loss
0.0299 (0.0299)    Prec 98.828% (98.828%)
Epoch: [99][90/196]    Time 0.059 (0.067)    Data 0.002 (0.011)    Loss
0.0203 (0.0222)    Prec 99.609% (99.287%)
Epoch: [99][180/196]    Time 0.060 (0.063)    Data 0.002 (0.007)    Loss
0.0581 (0.0210)    Prec 97.656% (99.299%)
Validation starts
Test: [0/40]    Time 0.367 (0.367)    Loss 0.3399 (0.3399)    Prec 92.578%
(92.578%)
* Prec 91.430%
best acc: 91.520000
Epoch: [100][0/196]    Time 0.714 (0.714)    Data 0.661 (0.661)    Loss
0.0166 (0.0166)    Prec 99.609% (99.609%)
Epoch: [100][90/196]    Time 0.055 (0.066)    Data 0.002 (0.010)    Loss
0.0142 (0.0197)    Prec 100.000% (99.369%)
Epoch: [100][180/196]    Time 0.062 (0.063)    Data 0.002 (0.007)    Loss

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0.0163 (0.0209) Prec 99.609% (99.320%)
Validation starts
Test: [0/40] Time 0.505 (0.505) Loss 0.3596 (0.3596) Prec 92.578%
(92.578%)
* Prec 91.430%
best acc: 91.520000
Epoch: [101][0/196] Time 0.898 (0.898) Data 0.846 (0.846) Loss
0.0337 (0.0337) Prec 99.609% (99.609%)
Epoch: [101][90/196] Time 0.060 (0.067) Data 0.002 (0.012) Loss
0.0096 (0.0203) Prec 100.000% (99.403%)
Epoch: [101][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
0.0272 (0.0210) Prec 98.828% (99.307%)
Validation starts
Test: [0/40] Time 0.283 (0.283) Loss 0.3855 (0.3855) Prec 91.406%
(91.406%)
* Prec 91.340%
best acc: 91.520000
Epoch: [102][0/196] Time 0.785 (0.785) Data 0.733 (0.733) Loss
0.0115 (0.0115) Prec 99.609% (99.609%)
Epoch: [102][90/196] Time 0.059 (0.066) Data 0.002 (0.011) Loss
0.0262 (0.0203) Prec 98.438% (99.335%)
Epoch: [102][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
0.0115 (0.0212) Prec 100.000% (99.290%)
Validation starts
Test: [0/40] Time 0.360 (0.360) Loss 0.3437 (0.3437) Prec 91.797%
(91.797%)
* Prec 91.200%
best acc: 91.520000
Epoch: [103][0/196] Time 0.994 (0.994) Data 0.939 (0.939) Loss
0.0238 (0.0238) Prec 99.609% (99.609%)
Epoch: [103][90/196] Time 0.059 (0.068) Data 0.002 (0.013) Loss
0.0174 (0.0214) Prec 98.828% (99.292%)
Epoch: [103][180/196] Time 0.058 (0.064) Data 0.002 (0.008) Loss
0.0435 (0.0208) Prec 98.047% (99.305%)
Validation starts
Test: [0/40] Time 0.445 (0.445) Loss 0.3684 (0.3684) Prec 90.234%
(90.234%)
* Prec 91.250%
best acc: 91.520000
Epoch: [104][0/196] Time 0.802 (0.802) Data 0.748 (0.748) Loss
0.0171 (0.0171) Prec 99.609% (99.609%)
Epoch: [104][90/196] Time 0.103 (0.066) Data 0.057 (0.011) Loss
0.0099 (0.0200) Prec 100.000% (99.335%)
Epoch: [104][180/196] Time 0.063 (0.063) Data 0.001 (0.007) Loss
0.0110 (0.0213) Prec 99.609% (99.279%)
Validation starts
Test: [0/40] Time 0.360 (0.360) Loss 0.3696 (0.3696) Prec 91.797%
(91.797%)


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* Prec 91.390%
best acc: 91.520000
Epoch: [105][0/196]      Time 0.890 (0.890)      Data 0.836 (0.836)      Loss
0.0092 (0.0092)      Prec 100.000% (100.000%)
Epoch: [105][90/196]    Time 0.116 (0.068)      Data 0.073 (0.012)      Loss
0.0129 (0.0182)      Prec 100.000% (99.455%)
Epoch: [105][180/196]   Time 0.054 (0.064)      Data 0.002 (0.008)      Loss
0.0131 (0.0200)      Prec 99.219% (99.359%)
Validation starts
Test: [0/40]      Time 0.416 (0.416)      Loss 0.3301 (0.3301)      Prec 91.797%
(91.797%)
* Prec 91.330%
best acc: 91.520000
Epoch: [106][0/196]      Time 0.824 (0.824)      Data 0.767 (0.767)      Loss
0.0223 (0.0223)      Prec 99.219% (99.219%)
Epoch: [106][90/196]    Time 0.060 (0.067)      Data 0.002 (0.012)      Loss
0.0117 (0.0202)      Prec 99.609% (99.335%)
Epoch: [106][180/196]   Time 0.060 (0.064)      Data 0.002 (0.008)      Loss
0.0218 (0.0204)      Prec 99.219% (99.340%)
Validation starts
Test: [0/40]      Time 0.307 (0.307)      Loss 0.3894 (0.3894)      Prec 91.016%
(91.016%)
* Prec 91.140%
best acc: 91.520000
Epoch: [107][0/196]      Time 0.637 (0.637)      Data 0.584 (0.584)      Loss
0.0220 (0.0220)      Prec 99.219% (99.219%)
Epoch: [107][90/196]    Time 0.061 (0.065)      Data 0.003 (0.010)      Loss
0.0305 (0.0210)      Prec 99.219% (99.335%)
Epoch: [107][180/196]   Time 0.060 (0.062)      Data 0.002 (0.006)      Loss
0.0191 (0.0214)      Prec 99.219% (99.312%)
Validation starts
Test: [0/40]      Time 0.327 (0.327)      Loss 0.3315 (0.3315)      Prec 92.188%
(92.188%)
* Prec 91.200%
best acc: 91.520000
Epoch: [108][0/196]      Time 0.768 (0.768)      Data 0.715 (0.715)      Loss
0.0289 (0.0289)      Prec 98.828% (98.828%)
Epoch: [108][90/196]    Time 0.059 (0.066)      Data 0.002 (0.011)      Loss
0.0169 (0.0196)      Prec 99.609% (99.378%)
Epoch: [108][180/196]   Time 0.058 (0.063)      Data 0.002 (0.007)      Loss
0.0201 (0.0207)      Prec 99.609% (99.314%)
Validation starts
Test: [0/40]      Time 0.365 (0.365)      Loss 0.3763 (0.3763)      Prec 92.578%
(92.578%)
* Prec 91.060%
best acc: 91.520000
Epoch: [109][0/196]      Time 0.806 (0.806)      Data 0.752 (0.752)      Loss
0.0100 (0.0100)      Prec 99.609% (99.609%)

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Epoch: [109][90/196] Time 0.054 (0.067) Data 0.002 (0.012) Loss
0.0399 (0.0228) Prec 98.828% (99.249%)

Epoch: [109][180/196] Time 0.057 (0.063) Data 0.002 (0.008) Loss
0.0216 (0.0212) Prec 99.219% (99.307%)

Validation starts
Test: [0/40] Time 0.688 (0.688) Loss 0.3762 (0.3762) Prec 91.016%
(91.016%)

* Prec 91.230%

best acc: 91.520000

Epoch: [110][0/196] Time 0.828 (0.828) Data 0.774 (0.774) Loss
0.0280 (0.0280) Prec 98.828% (98.828%)

Epoch: [110][90/196] Time 0.059 (0.068) Data 0.002 (0.011) Loss
0.0474 (0.0187) Prec 98.438% (99.416%)

Epoch: [110][180/196] Time 0.060 (0.064) Data 0.002 (0.007) Loss
0.0066 (0.0208) Prec 100.000% (99.344%)

Validation starts
Test: [0/40] Time 0.392 (0.392) Loss 0.4052 (0.4052) Prec 90.625%
(90.625%)

* Prec 91.090%

best acc: 91.520000

Epoch: [111][0/196] Time 0.782 (0.782) Data 0.723 (0.723) Loss
0.0056 (0.0056) Prec 100.000% (100.000%)

Epoch: [111][90/196] Time 0.059 (0.067) Data 0.003 (0.011) Loss
0.0164 (0.0206) Prec 99.219% (99.343%)

Epoch: [111][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0098 (0.0208) Prec 99.609% (99.327%)

Validation starts
Test: [0/40] Time 0.376 (0.376) Loss 0.3259 (0.3259) Prec 91.797%
(91.797%)

* Prec 91.340%

best acc: 91.520000

Epoch: [112][0/196] Time 0.918 (0.918) Data 0.858 (0.858) Loss
0.0222 (0.0222) Prec 99.609% (99.609%)

Epoch: [112][90/196] Time 0.057 (0.068) Data 0.003 (0.012) Loss
0.0162 (0.0206) Prec 99.219% (99.317%)

Epoch: [112][180/196] Time 0.061 (0.064) Data 0.002 (0.008) Loss
0.0176 (0.0213) Prec 99.219% (99.301%)

Validation starts
Test: [0/40] Time 0.364 (0.364) Loss 0.4132 (0.4132) Prec 90.625%
(90.625%)

* Prec 91.200%

best acc: 91.520000

Epoch: [113][0/196] Time 0.716 (0.716) Data 0.663 (0.663) Loss
0.0126 (0.0126) Prec 99.609% (99.609%)

Epoch: [113][90/196] Time 0.059 (0.066) Data 0.002 (0.010) Loss
0.0310 (0.0192) Prec 99.219% (99.429%)

Epoch: [113][180/196] Time 0.059 (0.063) Data 0.002 (0.007) Loss
0.0332 (0.0195) Prec 98.828% (99.407%)

Validation starts

Test: [0/40] Time 0.333 (0.333) Loss 0.3820 (0.3820) Prec 90.234%
(90.234%)

* Prec 91.160%

best acc: 91.520000

Epoch: [114][0/196] Time 0.841 (0.841) Data 0.788 (0.788) Loss
0.0124 (0.0124) Prec 99.609% (99.609%)

Epoch: [114][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0055 (0.0209) Prec 100.000% (99.360%)

Epoch: [114][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0123 (0.0206) Prec 99.609% (99.391%)

Validation starts

Test: [0/40] Time 0.462 (0.462) Loss 0.3823 (0.3823) Prec 91.797%
(91.797%)

* Prec 91.170%

best acc: 91.520000

Epoch: [115][0/196] Time 0.816 (0.816) Data 0.756 (0.756) Loss
0.0168 (0.0168) Prec 99.219% (99.219%)

Epoch: [115][90/196] Time 0.056 (0.067) Data 0.002 (0.011) Loss
0.0234 (0.0204) Prec 99.219% (99.313%)

Epoch: [115][180/196] Time 0.057 (0.063) Data 0.002 (0.007) Loss
0.0125 (0.0213) Prec 99.219% (99.307%)

Validation starts

Test: [0/40] Time 0.451 (0.451) Loss 0.3460 (0.3460) Prec 92.578%
(92.578%)

* Prec 91.210%

best acc: 91.520000

Epoch: [116][0/196] Time 0.844 (0.844) Data 0.784 (0.784) Loss
0.0236 (0.0236) Prec 99.219% (99.219%)

Epoch: [116][90/196] Time 0.057 (0.067) Data 0.002 (0.011) Loss
0.0149 (0.0219) Prec 100.000% (99.206%)

Epoch: [116][180/196] Time 0.058 (0.064) Data 0.002 (0.007) Loss
0.0112 (0.0216) Prec 100.000% (99.309%)

Validation starts

Test: [0/40] Time 0.505 (0.505) Loss 0.3431 (0.3431) Prec 93.750%
(93.750%)

* Prec 91.240%

best acc: 91.520000

Epoch: [117][0/196] Time 0.822 (0.822) Data 0.767 (0.767) Loss
0.0110 (0.0110) Prec 99.609% (99.609%)

Epoch: [117][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0157 (0.0228) Prec 99.609% (99.275%)

Epoch: [117][180/196] Time 0.059 (0.064) Data 0.002 (0.007) Loss
0.0181 (0.0213) Prec 99.219% (99.312%)

Validation starts

Test: [0/40] Time 0.403 (0.403) Loss 0.3160 (0.3160) Prec 92.578%
(92.578%)

* Prec 91.310%

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best acc: 91.520000
Epoch: [118][0/196]      Time 1.043 (1.043)      Data 0.988 (0.988)      Loss
0.0030 (0.0030)      Prec 100.000% (100.000%)
Epoch: [118][90/196]    Time 0.060 (0.070)      Data 0.002 (0.014)      Loss
0.0174 (0.0202)      Prec 99.609% (99.373%)
Epoch: [118][180/196]   Time 0.061 (0.065)      Data 0.002 (0.008)      Loss
0.0103 (0.0218)      Prec 99.609% (99.260%)
Validation starts
Test: [0/40]      Time 0.391 (0.391)      Loss 0.3456 (0.3456)      Prec 91.797%
(91.797%)
* Prec 91.070%
best acc: 91.520000
Epoch: [119][0/196]      Time 1.012 (1.012)      Data 0.959 (0.959)      Loss
0.0110 (0.0110)      Prec 100.000% (100.000%)
Epoch: [119][90/196]    Time 0.060 (0.069)      Data 0.002 (0.014)      Loss
0.0110 (0.0211)      Prec 99.609% (99.352%)
Epoch: [119][180/196]   Time 0.059 (0.064)      Data 0.002 (0.008)      Loss
0.0246 (0.0212)      Prec 99.609% (99.340%)
Validation starts
Test: [0/40]      Time 0.382 (0.382)      Loss 0.3400 (0.3400)      Prec 92.578%
(92.578%)
* Prec 91.410%
best acc: 91.520000
Epoch: [120][0/196]      Time 0.771 (0.771)      Data 0.718 (0.718)      Loss
0.0158 (0.0158)      Prec 99.219% (99.219%)
Epoch: [120][90/196]    Time 0.059 (0.066)      Data 0.002 (0.011)      Loss
0.0110 (0.0197)      Prec 99.609% (99.373%)
Epoch: [120][180/196]   Time 0.056 (0.063)      Data 0.002 (0.007)      Loss
0.0231 (0.0205)      Prec 98.828% (99.305%)
Validation starts
Test: [0/40]      Time 0.411 (0.411)      Loss 0.3260 (0.3260)      Prec 91.797%
(91.797%)
* Prec 91.220%
best acc: 91.520000
Epoch: [121][0/196]      Time 1.054 (1.054)      Data 0.998 (0.998)      Loss
0.0211 (0.0211)      Prec 98.828% (98.828%)
Epoch: [121][90/196]    Time 0.057 (0.069)      Data 0.002 (0.015)      Loss
0.0045 (0.0227)      Prec 100.000% (99.210%)
Epoch: [121][180/196]   Time 0.060 (0.064)      Data 0.002 (0.009)      Loss
0.0402 (0.0227)      Prec 99.219% (99.245%)
Validation starts
Test: [0/40]      Time 0.388 (0.388)      Loss 0.3877 (0.3877)      Prec 91.797%
(91.797%)
* Prec 91.100%
best acc: 91.520000
Epoch: [122][0/196]      Time 1.011 (1.011)      Data 0.960 (0.960)      Loss
0.0403 (0.0403)      Prec 98.828% (98.828%)
Epoch: [122][90/196]    Time 0.059 (0.069)      Data 0.002 (0.014)      Loss

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0.0043 (0.0206) Prec 100.000% (99.369%)
 Epoch: [122][180/196] Time 0.057 (0.064) Data 0.002 (0.008) Loss
 0.0606 (0.0211) Prec 98.438% (99.344%)
 Validation starts
 Test: [0/40] Time 0.286 (0.286) Loss 0.3472 (0.3472) Prec 92.969%
 (92.969%)
 * Prec 91.210%
 best acc: 91.520000
 Epoch: [123][0/196] Time 0.734 (0.734) Data 0.679 (0.679) Loss
 0.0291 (0.0291) Prec 99.219% (99.219%)
 Epoch: [123][90/196] Time 0.060 (0.065) Data 0.002 (0.010) Loss
 0.0188 (0.0202) Prec 98.828% (99.330%)
 Epoch: [123][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
 0.0165 (0.0220) Prec 99.609% (99.281%)
 Validation starts
 Test: [0/40] Time 0.361 (0.361) Loss 0.3605 (0.3605) Prec 91.016%
 (91.016%)
 * Prec 91.130%
 best acc: 91.520000
 Epoch: [124][0/196] Time 0.760 (0.760) Data 0.706 (0.706) Loss
 0.0184 (0.0184) Prec 99.219% (99.219%)
 Epoch: [124][90/196] Time 0.059 (0.066) Data 0.002 (0.010) Loss
 0.0192 (0.0208) Prec 98.828% (99.330%)
 Epoch: [124][180/196] Time 0.062 (0.063) Data 0.002 (0.006) Loss
 0.0462 (0.0210) Prec 98.828% (99.331%)
 Validation starts
 Test: [0/40] Time 0.600 (0.600) Loss 0.3494 (0.3494) Prec 92.969%
 (92.969%)
 * Prec 91.440%
 best acc: 91.520000
 Epoch: [125][0/196] Time 0.820 (0.820) Data 0.767 (0.767) Loss
 0.0234 (0.0234) Prec 98.828% (98.828%)
 Epoch: [125][90/196] Time 0.060 (0.066) Data 0.002 (0.011) Loss
 0.0167 (0.0218) Prec 99.609% (99.287%)
 Epoch: [125][180/196] Time 0.057 (0.063) Data 0.002 (0.007) Loss
 0.0414 (0.0219) Prec 98.828% (99.290%)
 Validation starts
 Test: [0/40] Time 0.352 (0.352) Loss 0.3257 (0.3257) Prec 92.969%
 (92.969%)
 * Prec 91.220%
 best acc: 91.520000
 Epoch: [126][0/196] Time 0.911 (0.911) Data 0.856 (0.856) Loss
 0.0260 (0.0260) Prec 98.828% (98.828%)
 Epoch: [126][90/196] Time 0.053 (0.067) Data 0.013 (0.012) Loss
 0.0085 (0.0216) Prec 100.000% (99.296%)
 Epoch: [126][180/196] Time 0.061 (0.063) Data 0.001 (0.007) Loss
 0.0154 (0.0211) Prec 99.609% (99.318%)
 Validation starts

Test: [0/40] Time 0.383 (0.383) Loss 0.3794 (0.3794) Prec 92.188%
(92.188%)
* Prec 91.170%
best acc: 91.520000

Epoch: [127][0/196]	Time 0.849 (0.849)	Data 0.795 (0.795)	Loss
0.0227 (0.0227)	Prec 98.828% (98.828%)		
Epoch: [127][90/196]	Time 0.058 (0.067)	Data 0.002 (0.012)	Loss
0.0149 (0.0205)	Prec 99.609% (99.369%)		
Epoch: [127][180/196]	Time 0.057 (0.063)	Data 0.002 (0.007)	Loss
0.0123 (0.0209)	Prec 99.609% (99.320%)		

Validation starts

Test: [0/40] Time 0.325 (0.325) Loss 0.3640 (0.3640) Prec 92.578%
(92.578%)
* Prec 91.260%
best acc: 91.520000

Epoch: [128][0/196]	Time 0.744 (0.744)	Data 0.688 (0.688)	Loss
0.0297 (0.0297)	Prec 99.219% (99.219%)		
Epoch: [128][90/196]	Time 0.061 (0.066)	Data 0.002 (0.011)	Loss
0.0107 (0.0207)	Prec 99.219% (99.292%)		
Epoch: [128][180/196]	Time 0.059 (0.063)	Data 0.002 (0.007)	Loss
0.0138 (0.0211)	Prec 99.609% (99.283%)		

Validation starts

Test: [0/40] Time 0.480 (0.480) Loss 0.3488 (0.3488) Prec 92.188%
(92.188%)
* Prec 91.180%
best acc: 91.520000

Epoch: [129][0/196]	Time 0.911 (0.911)	Data 0.858 (0.858)	Loss
0.0169 (0.0169)	Prec 99.219% (99.219%)		
Epoch: [129][90/196]	Time 0.060 (0.070)	Data 0.003 (0.014)	Loss
0.0246 (0.0206)	Prec 99.219% (99.386%)		
Epoch: [129][180/196]	Time 0.062 (0.064)	Data 0.002 (0.009)	Loss
0.0345 (0.0204)	Prec 98.828% (99.374%)		

Validation starts

Test: [0/40] Time 0.405 (0.405) Loss 0.3557 (0.3557) Prec 92.188%
(92.188%)
* Prec 91.520%
best acc: 91.520000

Epoch: [130][0/196]	Time 0.707 (0.707)	Data 0.655 (0.655)	Loss
0.0357 (0.0357)	Prec 98.438% (98.438%)		
Epoch: [130][90/196]	Time 0.058 (0.066)	Data 0.002 (0.010)	Loss
0.0126 (0.0226)	Prec 99.609% (99.223%)		
Epoch: [130][180/196]	Time 0.058 (0.063)	Data 0.002 (0.007)	Loss
0.0381 (0.0224)	Prec 98.438% (99.260%)		

Validation starts

Test: [0/40] Time 0.360 (0.360) Loss 0.3299 (0.3299) Prec 92.969%
(92.969%)
* Prec 91.130%
best acc: 91.520000

Epoch: [131][0/196] Time 0.931 (0.931) Data 0.878 (0.878) Loss
0.0150 (0.0150) Prec 100.000% (100.000%)

Epoch: [131][90/196] Time 0.059 (0.068) Data 0.002 (0.012) Loss
0.0087 (0.0200) Prec 100.000% (99.373%)

Epoch: [131][180/196] Time 0.059 (0.064) Data 0.002 (0.008) Loss
0.0253 (0.0200) Prec 99.219% (99.366%)

Validation starts

Test: [0/40] Time 0.351 (0.351) Loss 0.3230 (0.3230) Prec 93.359%
(93.359%)

* Prec 91.350%

best acc: 91.520000

Epoch: [132][0/196] Time 0.811 (0.811) Data 0.759 (0.759) Loss
0.0398 (0.0398) Prec 99.219% (99.219%)

Epoch: [132][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0313 (0.0209) Prec 99.219% (99.322%)

Epoch: [132][180/196] Time 0.067 (0.063) Data 0.002 (0.007) Loss
0.0273 (0.0216) Prec 99.219% (99.286%)

Validation starts

Test: [0/40] Time 0.362 (0.362) Loss 0.3578 (0.3578) Prec 91.016%
(91.016%)

* Prec 91.340%

best acc: 91.520000

Epoch: [133][0/196] Time 0.780 (0.780) Data 0.722 (0.722) Loss
0.0276 (0.0276) Prec 98.828% (98.828%)

Epoch: [133][90/196] Time 0.061 (0.067) Data 0.002 (0.011) Loss
0.0195 (0.0198) Prec 99.219% (99.390%)

Epoch: [133][180/196] Time 0.061 (0.064) Data 0.002 (0.007) Loss
0.0373 (0.0211) Prec 98.828% (99.327%)

Validation starts

Test: [0/40] Time 0.390 (0.390) Loss 0.3885 (0.3885) Prec 91.797%
(91.797%)

* Prec 91.340%

best acc: 91.520000

Epoch: [134][0/196] Time 0.876 (0.876) Data 0.818 (0.818) Loss
0.0361 (0.0361) Prec 98.828% (98.828%)

Epoch: [134][90/196] Time 0.059 (0.069) Data 0.001 (0.012) Loss
0.0219 (0.0221) Prec 99.219% (99.313%)

Epoch: [134][180/196] Time 0.058 (0.064) Data 0.002 (0.007) Loss
0.0597 (0.0217) Prec 98.828% (99.288%)

Validation starts

Test: [0/40] Time 0.867 (0.867) Loss 0.3314 (0.3314) Prec 92.188%
(92.188%)

* Prec 91.290%

best acc: 91.520000

Epoch: [135][0/196] Time 0.797 (0.797) Data 0.745 (0.745) Loss
0.0177 (0.0177) Prec 99.219% (99.219%)

Epoch: [135][90/196] Time 0.061 (0.067) Data 0.002 (0.012) Loss
0.0407 (0.0223) Prec 98.438% (99.296%)

Epoch: [135][180/196] Time 0.053 (0.063) Data 0.002 (0.008) Loss
0.0225 (0.0213) Prec 99.219% (99.309%)
Validation starts
Test: [0/40] Time 0.929 (0.929) Loss 0.3432 (0.3432) Prec 92.188%
(92.188%)
* Prec 91.460%
best acc: 91.520000
Epoch: [136][0/196] Time 0.884 (0.884) Data 0.829 (0.829) Loss
0.0308 (0.0308) Prec 98.828% (98.828%)
Epoch: [136][90/196] Time 0.060 (0.067) Data 0.001 (0.011) Loss
0.0332 (0.0213) Prec 98.828% (99.313%)
Epoch: [136][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
0.0128 (0.0214) Prec 99.609% (99.322%)
Validation starts
Test: [0/40] Time 0.392 (0.392) Loss 0.3847 (0.3847) Prec 90.625%
(90.625%)
* Prec 91.200%
best acc: 91.520000
Epoch: [137][0/196] Time 0.729 (0.729) Data 0.676 (0.676) Loss
0.0100 (0.0100) Prec 100.000% (100.000%)
Epoch: [137][90/196] Time 0.058 (0.066) Data 0.002 (0.011) Loss
0.0194 (0.0215) Prec 99.609% (99.296%)
Epoch: [137][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0385 (0.0212) Prec 98.828% (99.327%)
Validation starts
Test: [0/40] Time 0.367 (0.367) Loss 0.3473 (0.3473) Prec 92.188%
(92.188%)
* Prec 91.290%
best acc: 91.520000
Epoch: [138][0/196] Time 1.044 (1.044) Data 0.990 (0.990) Loss
0.0326 (0.0326) Prec 99.219% (99.219%)
Epoch: [138][90/196] Time 0.081 (0.069) Data 0.034 (0.013) Loss
0.0108 (0.0214) Prec 99.609% (99.300%)
Epoch: [138][180/196] Time 0.059 (0.064) Data 0.002 (0.008) Loss
0.0338 (0.0217) Prec 98.828% (99.275%)
Validation starts
Test: [0/40] Time 0.439 (0.439) Loss 0.3765 (0.3765) Prec 91.016%
(91.016%)
* Prec 91.290%
best acc: 91.520000
Epoch: [139][0/196] Time 0.941 (0.941) Data 0.887 (0.887) Loss
0.0154 (0.0154) Prec 99.609% (99.609%)
Epoch: [139][90/196] Time 0.086 (0.068) Data 0.040 (0.013) Loss
0.0328 (0.0218) Prec 98.828% (99.296%)
Epoch: [139][180/196] Time 0.059 (0.063) Data 0.002 (0.008) Loss
0.0126 (0.0210) Prec 99.609% (99.309%)
Validation starts
Test: [0/40] Time 0.703 (0.703) Loss 0.3952 (0.3952) Prec 90.234%


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(90.234%)
* Prec 91.010%
best acc: 91.520000
Epoch: [140][0/196]      Time 0.733 (0.733)      Data 0.679 (0.679)      Loss
0.0060 (0.0060)      Prec 100.000% (100.000%)
Epoch: [140][90/196]    Time 0.053 (0.066)      Data 0.002 (0.010)      Loss
0.0091 (0.0201)      Prec 99.609% (99.378%)
Epoch: [140][180/196]   Time 0.060 (0.063)      Data 0.002 (0.007)      Loss
0.0164 (0.0205)      Prec 100.000% (99.381%)
Validation starts
Test: [0/40]      Time 0.404 (0.404)      Loss 0.3862 (0.3862)      Prec 90.625%
(90.625%)
* Prec 91.230%
best acc: 91.520000
Epoch: [141][0/196]      Time 0.635 (0.635)      Data 0.582 (0.582)      Loss
0.0179 (0.0179)      Prec 99.609% (99.609%)
Epoch: [141][90/196]    Time 0.057 (0.065)      Data 0.002 (0.009)      Loss
0.0056 (0.0206)      Prec 100.000% (99.382%)
Epoch: [141][180/196]   Time 0.062 (0.062)      Data 0.002 (0.006)      Loss
0.0077 (0.0201)      Prec 100.000% (99.381%)
Validation starts
Test: [0/40]      Time 0.533 (0.533)      Loss 0.3388 (0.3388)      Prec 92.188%
(92.188%)
* Prec 91.460%
best acc: 91.520000
Epoch: [142][0/196]      Time 0.732 (0.732)      Data 0.679 (0.679)      Loss
0.0182 (0.0182)      Prec 99.609% (99.609%)
Epoch: [142][90/196]    Time 0.060 (0.066)      Data 0.002 (0.010)      Loss
0.0061 (0.0209)      Prec 100.000% (99.378%)
Epoch: [142][180/196]   Time 0.057 (0.062)      Data 0.002 (0.006)      Loss
0.0318 (0.0209)      Prec 98.828% (99.342%)
Validation starts
Test: [0/40]      Time 0.312 (0.312)      Loss 0.3239 (0.3239)      Prec 92.188%
(92.188%)
* Prec 91.180%
best acc: 91.520000
Epoch: [143][0/196]      Time 0.707 (0.707)      Data 0.654 (0.654)      Loss
0.0194 (0.0194)      Prec 99.219% (99.219%)
Epoch: [143][90/196]    Time 0.055 (0.066)      Data 0.002 (0.011)      Loss
0.0274 (0.0213)      Prec 99.609% (99.292%)
Epoch: [143][180/196]   Time 0.065 (0.063)      Data 0.002 (0.007)      Loss
0.0227 (0.0200)      Prec 98.828% (99.366%)
Validation starts
Test: [0/40]      Time 0.650 (0.650)      Loss 0.3682 (0.3682)      Prec 91.797%
(91.797%)
* Prec 91.080%
best acc: 91.520000
Epoch: [144][0/196]      Time 0.749 (0.749)      Data 0.696 (0.696)      Loss

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0.0142 (0.0142)    Prec 99.219% (99.219%)
Epoch: [144][90/196]    Time 0.050 (0.066)    Data 0.002 (0.011)    Loss
0.0107 (0.0205)    Prec 100.000% (99.313%)
Epoch: [144][180/196]    Time 0.055 (0.063)    Data 0.002 (0.007)    Loss
0.0216 (0.0202)    Prec 99.219% (99.366%)
Validation starts
Test: [0/40]    Time 0.573 (0.573)    Loss 0.3693 (0.3693)    Prec 91.016%
(91.016%)
* Prec 91.050%
best acc: 91.520000
Epoch: [145][0/196]    Time 0.767 (0.767)    Data 0.710 (0.710)    Loss
0.0307 (0.0307)    Prec 98.438% (98.438%)
Epoch: [145][90/196]    Time 0.056 (0.067)    Data 0.003 (0.011)    Loss
0.0129 (0.0203)    Prec 99.219% (99.317%)
Epoch: [145][180/196]    Time 0.056 (0.063)    Data 0.002 (0.007)    Loss
0.0301 (0.0196)    Prec 99.609% (99.350%)
Validation starts
Test: [0/40]    Time 0.356 (0.356)    Loss 0.3788 (0.3788)    Prec 90.625%
(90.625%)
* Prec 91.030%
best acc: 91.520000
Epoch: [146][0/196]    Time 0.862 (0.862)    Data 0.803 (0.803)    Loss
0.0325 (0.0325)    Prec 98.828% (98.828%)
Epoch: [146][90/196]    Time 0.058 (0.067)    Data 0.002 (0.011)    Loss
0.0186 (0.0221)    Prec 99.609% (99.309%)
Epoch: [146][180/196]    Time 0.059 (0.064)    Data 0.002 (0.007)    Loss
0.0299 (0.0219)    Prec 98.438% (99.294%)
Validation starts
Test: [0/40]    Time 0.342 (0.342)    Loss 0.3464 (0.3464)    Prec 92.969%
(92.969%)
* Prec 91.310%
best acc: 91.520000
Epoch: [147][0/196]    Time 0.713 (0.713)    Data 0.660 (0.660)    Loss
0.0165 (0.0165)    Prec 99.219% (99.219%)
Epoch: [147][90/196]    Time 0.060 (0.066)    Data 0.002 (0.010)    Loss
0.0128 (0.0197)    Prec 100.000% (99.300%)
Epoch: [147][180/196]    Time 0.059 (0.063)    Data 0.002 (0.007)    Loss
0.0120 (0.0207)    Prec 100.000% (99.268%)
Validation starts
Test: [0/40]    Time 0.318 (0.318)    Loss 0.3456 (0.3456)    Prec 92.188%
(92.188%)
* Prec 91.260%
best acc: 91.520000
Epoch: [148][0/196]    Time 0.757 (0.757)    Data 0.704 (0.704)    Loss
0.0311 (0.0311)    Prec 98.828% (98.828%)
Epoch: [148][90/196]    Time 0.059 (0.066)    Data 0.003 (0.011)    Loss
0.0161 (0.0219)    Prec 99.219% (99.262%)
Epoch: [148][180/196]    Time 0.056 (0.063)    Data 0.002 (0.006)    Loss

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0.0389 (0.0213) Prec 98.438% (99.303%)
Validation starts
Test: [0/40] Time 0.283 (0.283) Loss 0.3917 (0.3917) Prec 91.797%
(91.797%)
* Prec 91.200%
best acc: 91.520000
Epoch: [149][0/196] Time 0.718 (0.718) Data 0.665 (0.665) Loss
0.0091 (0.0091) Prec 100.000% (100.000%)
Epoch: [149][90/196] Time 0.055 (0.065) Data 0.003 (0.010) Loss
0.0318 (0.0220) Prec 98.828% (99.240%)
Epoch: [149][180/196] Time 0.061 (0.062) Data 0.002 (0.007) Loss
0.0261 (0.0212) Prec 99.219% (99.288%)
Validation starts
Test: [0/40] Time 0.521 (0.521) Loss 0.3626 (0.3626) Prec 91.797%
(91.797%)
* Prec 91.230%
best acc: 91.520000
Epoch: [150][0/196] Time 0.782 (0.782) Data 0.729 (0.729) Loss
0.0255 (0.0255) Prec 98.828% (98.828%)
Epoch: [150][90/196] Time 0.059 (0.067) Data 0.002 (0.011) Loss
0.0150 (0.0205) Prec 99.609% (99.373%)
Epoch: [150][180/196] Time 0.060 (0.063) Data 0.002 (0.007) Loss
0.0189 (0.0211) Prec 99.219% (99.337%)
Validation starts
Test: [0/40] Time 0.505 (0.505) Loss 0.3565 (0.3565) Prec 92.969%
(92.969%)
* Prec 91.340%
best acc: 91.520000
Epoch: [151][0/196] Time 0.775 (0.775) Data 0.737 (0.737) Loss
0.0482 (0.0482) Prec 98.438% (98.438%)
Epoch: [151][90/196] Time 0.058 (0.066) Data 0.002 (0.011) Loss
0.0316 (0.0204) Prec 98.828% (99.317%)
Epoch: [151][180/196] Time 0.058 (0.063) Data 0.002 (0.007) Loss
0.0092 (0.0204) Prec 99.609% (99.314%)
Validation starts
Test: [0/40] Time 0.382 (0.382) Loss 0.3678 (0.3678) Prec 92.188%
(92.188%)
* Prec 91.150%
best acc: 91.520000
Epoch: [152][0/196] Time 0.827 (0.827) Data 0.774 (0.774) Loss
0.0220 (0.0220) Prec 99.219% (99.219%)
Epoch: [152][90/196] Time 0.059 (0.066) Data 0.002 (0.011) Loss
0.0113 (0.0207) Prec 100.000% (99.279%)
Epoch: [152][180/196] Time 0.061 (0.063) Data 0.002 (0.007) Loss
0.0069 (0.0209) Prec 100.000% (99.305%)
Validation starts
Test: [0/40] Time 0.439 (0.439) Loss 0.3744 (0.3744) Prec 90.625%
(90.625%)

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* Prec 91.050%
best acc: 91.520000
Epoch: [153][0/196]      Time 0.741 (0.741)      Data 0.687 (0.687)      Loss
0.0410 (0.0410)      Prec 98.438% (98.438%)
Epoch: [153][90/196]    Time 0.060 (0.066)      Data 0.002 (0.011)      Loss
0.0351 (0.0218)      Prec 98.438% (99.283%)
Epoch: [153][180/196]   Time 0.061 (0.063)      Data 0.002 (0.007)      Loss
0.0308 (0.0205)      Prec 98.047% (99.355%)
Validation starts
Test: [0/40]      Time 0.587 (0.587)      Loss 0.3841 (0.3841)      Prec 91.797%
(91.797%)
* Prec 91.150%
best acc: 91.520000
Epoch: [154][0/196]      Time 0.871 (0.871)      Data 0.819 (0.819)      Loss
0.0178 (0.0178)      Prec 98.828% (98.828%)
Epoch: [154][90/196]    Time 0.091 (0.068)      Data 0.043 (0.012)      Loss
0.0273 (0.0228)      Prec 99.219% (99.266%)
Epoch: [154][180/196]   Time 0.061 (0.063)      Data 0.002 (0.007)      Loss
0.0110 (0.0212)      Prec 99.609% (99.305%)
Validation starts
Test: [0/40]      Time 0.394 (0.394)      Loss 0.3515 (0.3515)      Prec 92.969%
(92.969%)
* Prec 91.100%
best acc: 91.520000
Epoch: [155][0/196]      Time 0.980 (0.980)      Data 0.927 (0.927)      Loss
0.0184 (0.0184)      Prec 99.609% (99.609%)
Epoch: [155][90/196]    Time 0.057 (0.068)      Data 0.002 (0.012)      Loss
0.0128 (0.0209)      Prec 99.609% (99.287%)
Epoch: [155][180/196]   Time 0.058 (0.064)      Data 0.002 (0.007)      Loss
0.0067 (0.0202)      Prec 100.000% (99.312%)
Validation starts
Test: [0/40]      Time 0.417 (0.417)      Loss 0.3328 (0.3328)      Prec 92.578%
(92.578%)
* Prec 91.570%
best acc: 91.570000
Epoch: [156][0/196]      Time 0.804 (0.804)      Data 0.750 (0.750)      Loss
0.0090 (0.0090)      Prec 100.000% (100.000%)
Epoch: [156][90/196]    Time 0.060 (0.067)      Data 0.002 (0.012)      Loss
0.0151 (0.0211)      Prec 99.609% (99.275%)
Epoch: [156][180/196]   Time 0.061 (0.064)      Data 0.002 (0.008)      Loss
0.0150 (0.0207)      Prec 99.609% (99.337%)
Validation starts
Test: [0/40]      Time 0.615 (0.615)      Loss 0.3227 (0.3227)      Prec 91.406%
(91.406%)
* Prec 91.280%
best acc: 91.570000
Epoch: [157][0/196]      Time 0.852 (0.852)      Data 0.800 (0.800)      Loss
0.0142 (0.0142)      Prec 99.609% (99.609%)

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Epoch: [157][90/196]    Time 0.054 (0.067)    Data 0.002 (0.012)    Loss
0.0123 (0.0207)    Prec 99.609% (99.330%)
Epoch: [157][180/196]  Time 0.059 (0.063)    Data 0.002 (0.007)    Loss
0.0090 (0.0201)    Prec 100.000% (99.353%)
Validation starts
Test: [0/40]    Time 0.356 (0.356)    Loss 0.3602 (0.3602)    Prec 92.578%
(92.578%)
    * Prec 91.290%
best acc: 91.570000
Epoch: [158][0/196]    Time 0.781 (0.781)    Data 0.726 (0.726)    Loss
0.0143 (0.0143)    Prec 99.219% (99.219%)
Epoch: [158][90/196]  Time 0.060 (0.066)    Data 0.002 (0.011)    Loss
0.0331 (0.0198)    Prec 98.438% (99.390%)
Epoch: [158][180/196]  Time 0.056 (0.063)    Data 0.003 (0.007)    Loss
0.0486 (0.0202)    Prec 98.047% (99.340%)
Validation starts
Test: [0/40]    Time 0.289 (0.289)    Loss 0.3378 (0.3378)    Prec 92.969%
(92.969%)
    * Prec 91.250%
best acc: 91.570000
Epoch: [159][0/196]    Time 0.722 (0.722)    Data 0.668 (0.668)    Loss
0.0179 (0.0179)    Prec 99.219% (99.219%)
Epoch: [159][90/196]  Time 0.053 (0.066)    Data 0.002 (0.010)    Loss
0.0190 (0.0195)    Prec 99.219% (99.382%)
Epoch: [159][180/196]  Time 0.057 (0.063)    Data 0.002 (0.007)    Loss
0.0086 (0.0198)    Prec 100.000% (99.378%)
Validation starts
Test: [0/40]    Time 0.281 (0.281)    Loss 0.3544 (0.3544)    Prec 91.406%
(91.406%)
    * Prec 91.290%
best acc: 91.570000

```

```

[15]: fdir = 'result/'+str(model_name)+'model_best.pth.tar'

checkpoint = torch.load(fdir)
model.load_state_dict(checkpoint['state_dict'])
device = torch.device("cuda")

model.cuda()
model.eval()

test_loss = 0
correct = 0

with torch.no_grad():
    for data, target in testloader:
        data, target = data.to(device), target.to(device) # loading to GPU

```

```
output = model(data)
pred = output.argmax(dim=1, keepdim=True)
correct += pred.eq(target.view_as(pred)).sum().item()

test_loss /= len(testloader.dataset)

print('\nTest set: Accuracy: {}/{} ({:.0f}%) \n'.format(
    correct, len(testloader.dataset),
    100. * correct / len(testloader.dataset)))
```

Test set: Accuracy: 9157/10000 (92%)

[]: