VGG16_Quantization_Aware_Training

December 13, 2025

[ ]:
```
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 *


global best_prec
use_gpu = torch.cuda.is_available()
print('=> Building model...')



batch_size = 512
model_name = "VGG16_quant_project_part1"   #"Resnet20_quant"
model = VGG16_quant_project_part1()

print(model)

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,
    ]))
trainloader = torch.utils.data.DataLoader(train_dataset, batch_size=batch_size,␣
 ↪shuffle=True, num_workers=2)


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

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


print_freq = 100 # every 100 batches, accuracy printed. Here, each batch␣
 ↪includes "batch_size" data points
# CIFAR10 has 50,000 training data, and 10,000 validation data.

def train(trainloader, model, criterion, optimizer, epoch):
    batch_time = AverageMeter()
    data_time = AverageMeter()
    losses = AverageMeter()
    top1 = AverageMeter()

    model.train()

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

        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)
        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))



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


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)
    pred = pred.t()
    correct = pred.eq(target.view(1, -1).expand_as(pred))

    res = []
    for k in topk:
        correct_k = correct[:k].view(-1).float().sum(0)
        res.append(correct_k.mul_(100.0 / batch_size))
    return res


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
        self.count += n
        self.avg = self.sum / self.count


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'))


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 = [80, 120]
    if epoch in adjust_list:
        for param_group in optimizer.param_groups:
            param_group['lr'] = param_group['lr'] * 0.1

#model = nn.DataParallel(model).cuda()
#all_params = checkpoint['state_dict']
#model.load_state_dict(all_params, strict=False)
#criterion = nn.CrossEntropyLoss().cuda()
#validate(testloader, model, criterion)
```

```
=> Building model…
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)
    (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, 8, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
    (25): BatchNorm2d(8, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
    (26): ReLU(inplace=True)
    (27): QuantConv2d(
      8, 8, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
```

```
    (28): ReLU(inplace=True)
    (29): QuantConv2d(
      8, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
    (30): ReLU(inplace=True)
    (31): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
    (32): QuantConv2d(
      512, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
    (33): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
    (34): ReLU(inplace=True)
    (35): QuantConv2d(
      512, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
    (36): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
    (37): ReLU(inplace=True)
    (38): QuantConv2d(
      512, 512, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1), bias=False
      (weight_quant): weight_quantize_fn()
    )
    (39): BatchNorm2d(512, eps=1e-05, momentum=0.1, affine=True,
track_running_stats=True)
    (40): ReLU(inplace=True)
    (41): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1,
ceil_mode=False)
    (42): AvgPool2d(kernel_size=1, stride=1, padding=0)
  )
  (classifier): Linear(in_features=512, out_features=10, bias=True)
)
```

[3]:
```python
import torch.nn.utils.prune as prune

def prune_model(model, amount=0.8, method='mixed'):
    """
    Applies pruning to the model.
    method:
        'unstructured': Prunes individual weights (L1 norm).
        'structured': Prunes entire channels/filters (L1 norm).
        'mixed': Combines structured and unstructured pruning to achieve the␣
 ↪target sparsity.
                 (e.g., 40% structured + remaining unstructured to reach target)
```

```
    """
    print(f"Applying {method} pruning with target amount={amount}...")

    for name, module in model.named_modules():
        if isinstance(module, (QuantConv2d, nn.Conv2d, nn.Linear)):
            if method == 'unstructured':
                prune.l1_unstructured(module, name='weight', amount=amount)
            elif method == 'structured':
                # Prune output channels (dim=0)
                prune.ln_structured(module, name='weight', amount=amount, n=1,␣
↪dim=0)
            elif method == 'mixed':
                # Strategy: Apply 50% structured pruning, then apply␣
↪unstructured pruning
                # to the remaining weights to reach the total target amount.
                # Formula: total_sparsity = 1 - (1 - s) * (1 - u)
                # If target is 0.8 and s is 0.5:
                # 0.8 = 1 - (0.5) * (1 - u) => 0.2 = 0.5 * (1 - u) => 0.4 = 1 -␣
↪u => u = 0.6

                s_amount = 0.4 # Fixed structured amount
                if amount > s_amount:
                    u_amount = 1 - (1 - amount) / (1 - s_amount)

                    # Apply structured first
                    prune.ln_structured(module, name='weight', amount=s_amount,␣
↪n=1, dim=0)
                    # Apply unstructured on top
                    prune.l1_unstructured(module, name='weight',␣
↪amount=u_amount)
                else:
                    # If target is less than fixed structured amount, just use␣
↪structured
                    prune.ln_structured(module, name='weight', amount=amount,␣
↪n=1, dim=0)

    # Calculate and print global sparsity
    total_zeros = 0
    total_params = 0
    for name, module in model.named_modules():
        if isinstance(module, (QuantConv2d, nn.Conv2d, nn.Linear)):
            if hasattr(module, 'weight'):
                # Check for mask
                if prune.is_pruned(module):
                    zeros = torch.sum(module.weight == 0).item()
                else:
```

```
                    zeros = torch.sum(module.weight == 0).item()
                total_zeros += zeros
                total_params += module.weight.nelement()

    if total_params > 0:
        print(f"Global sparsity achieved: {total_zeros/total_params*100:.2f}%")

# Example usage:
# prune_model(model, amount=0.8, method='mixed')

# Note: To make pruning permanent (remove masks and update weights permanently):
# for name, module in model.named_modules():
#     if isinstance(module, (QuantConv2d, nn.Conv2d, nn.Linear)):
#         if prune.is_pruned(module):
#             prune.remove(module, 'weight')
```

[4]:
```
import matplotlib.pyplot as plt
import numpy as np

def visualize_feature_maps(model, input_image, layer_idx=0, title="Feature␣
 ↪Maps"):
    """
    Visualizes the feature maps of a specific convolutional layer in the model.
    Args:
        model: The PyTorch model.
        input_image: A single input image tensor [1, C, H, W].
        layer_idx: The index of the convolutional layer in model.features to␣
 ↪visualize.
        title: Title for the plot.
    """
    model.eval()
    activations = []

    def hook(module, input, output):
        activations.append(output)

    # Register hook to the specified convolutional layer index
    count = 0
    handle = None
    # Iterate through features to find the conv layer
    for m in model.features:
        if isinstance(m, (nn.Conv2d, QuantConv2d)):
            if count == layer_idx:
                handle = m.register_forward_hook(hook)
                break
            count += 1
```

```
    if handle is None:
        print(f"Convolutional layer index {layer_idx} not found")
        return

    # Forward pass
    with torch.no_grad():
        model(input_image)

    handle.remove()

    # Plot
    if len(activations) > 0:
        fmaps = activations[0][0].cpu().numpy() # [C, H, W]
        num_plots = min(16, fmaps.shape[0]) # Plot up to 16 feature maps

        rows = 2
        cols = 8
        fig, axes = plt.subplots(rows, cols, figsize=(16, 4))
        fig.suptitle(title, fontsize=16)

        for i in range(rows * cols):
            ax = axes[i // cols, i % cols]
            if i < num_plots:
                # Use gray_r colormap so 0 (inactive) appears white, and high␣
 ↪values appear black/dark
                ax.imshow(fmaps[i], cmap='gray_r')
            ax.axis('off')
        plt.show()
    else:
        print("No activations captured.")
```

[ ]:
```
lr = 1e-3
weight_decay = 1e-6
epochs = 1000
best_prec = 0
# momentum = 0.9
#model = nn.DataParallel(model).cuda()
model.cuda()
criterion = nn.CrossEntropyLoss(label_smoothing=0.1).cuda()
# optimizer = torch.optim.SGD(model.parameters(), lr=lr, momentum=0.9,␣
 ↪weight_decay=weight_decay)
optimizer = torch.optim.Adam(model.parameters(), lr=lr,␣
 ↪weight_decay=weight_decay)
#cudnn.benchmark = True

from torch.optim.lr_scheduler import CosineAnnealingLR
scheduler = CosineAnnealingLR(
```

```
    optimizer,
    T_max=epochs,  # 500
    eta_min=1e-10,  # final LR
)



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):

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

    # evaluate on test set
    print("Validation starts")
    prec = 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))
    save_checkpoint({
        'epoch': epoch + 1,
        'state_dict': model.state_dict(),
        'best_prec': best_prec,
        'optimizer': optimizer.state_dict(),
    }, is_best, fdir)
    scheduler.step()
```

[5]:
```
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: 9162/10000 (92%)
```

[5]:
```
# Pre-hook to save inputs
class SaveOutput:
    def __init__(self):
        self.outputs = []   # list of (name, module_in) for pre-hooks
    def clear(self):
        self.outputs = []

save_output = SaveOutput()
hook_map = []   # keeps the module name for each saved output

def make_pre_hook(name):
    def hook(module, module_in, module_out=None):
        # store (module_name, module_in tensor)
        save_output.outputs.append((name, module_in))
        hook_map.append(name)
    return hook

# register named pre-hooks only for relevant layer types
for name, module in model.named_modules():
    if isinstance(module, (torch.nn.Conv2d, torch.nn.MaxPool2d, torch.nn.ReLU)):
        module.register_forward_pre_hook(make_pre_hook(name))

# run a single batch to populate save_output
device = torch.device("cuda" if torch.cuda.is_available() else "cpu")
model.to(device)
save_output.clear()
images, labels = next(iter(testloader))
images = images.to(device)
_ = model(images)

# print mapping of saved outputs
```

```
print("Saved-hook index -> module name (in order):")
for idx, nm in enumerate(hook_map):
    print(idx, ":", nm)

# show modules that have weight_q (quantized convs) and find their hook indices
print("\nModules that expose weight_q (quantized conv layers):")
quant_names = []
for name, m in model.named_modules():
    if hasattr(m, 'weight_q'):
        print("  -", name)
        quant_names.append(name)

print("\nHook indices for quantized modules (if present in hook_map):")
for qn in quant_names:
    indices = [i for i, nm in enumerate(hook_map) if nm == qn]
    print(qn, "-> hook indices:", indices)
```

```
Saved-hook index -> module name (in order):
0 : features.0
1 : features.2
2 : features.3
3 : features.5
4 : features.6
5 : features.7
6 : features.9
7 : features.10
8 : features.12
9 : features.13
10 : features.14
11 : features.16
12 : features.17
13 : features.19
14 : features.20
15 : features.22
16 : features.23
17 : features.24
18 : features.26
19 : features.27
20 : features.28
21 : features.29
22 : features.30
23 : features.31
24 : features.32
25 : features.34
26 : features.35
27 : features.37
28 : features.38
29 : features.40
```

```
30 : features.41

Modules that expose weight_q (quantized conv layers):
  - features.0
  - features.0.weight_quant
  - features.3
  - features.3.weight_quant
  - features.7
  - features.7.weight_quant
  - features.10
  - features.10.weight_quant
  - features.14
  - features.14.weight_quant
  - features.17
  - features.17.weight_quant
  - features.20
  - features.20.weight_quant
  - features.24
  - features.24.weight_quant
  - features.27
  - features.27.weight_quant
  - features.29
  - features.29.weight_quant
  - features.32
  - features.32.weight_quant
  - features.35
  - features.35.weight_quant
  - features.38
  - features.38.weight_quant

Hook indices for quantized modules (if present in hook_map):
features.0 -> hook indices: [0]
features.0.weight_quant -> hook indices: []
features.3 -> hook indices: [2]
features.3.weight_quant -> hook indices: []
features.7 -> hook indices: [5]
features.7.weight_quant -> hook indices: []
features.10 -> hook indices: [7]
features.10.weight_quant -> hook indices: []
features.14 -> hook indices: [10]
features.14.weight_quant -> hook indices: []
features.17 -> hook indices: [12]
features.17.weight_quant -> hook indices: []
features.20 -> hook indices: [14]
features.20.weight_quant -> hook indices: []
features.24 -> hook indices: [17]
features.24.weight_quant -> hook indices: []
features.27 -> hook indices: [19]
```

```
features.27.weight_quant -> hook indices: []
features.29 -> hook indices: [21]
features.29.weight_quant -> hook indices: []
features.32 -> hook indices: [24]
features.32.weight_quant -> hook indices: []
features.35 -> hook indices: [26]
features.35.weight_quant -> hook indices: []
features.38 -> hook indices: [28]
features.38.weight_quant -> hook indices: []
```

[11]:
```python
# Find x_int and w_int for the 8*8 convolution layer
# Search for the layer with 8 input channels and 8 output channels
target_layer = None
for name, m in model.named_modules():
    # Check for Conv2d or QuantConv2d
    if hasattr(m, 'in_channels') and hasattr(m, 'out_channels'):
        if m.in_channels == 8 and m.out_channels == 8:
            target_layer = name
            print(f"Found target layer: {name} (In: {m.in_channels}, Out: {m.
 ↪out_channels})")
            break

if target_layer is None:
    print("Error: Could not find a layer with 8 input and 8 output channels.␣
 ↪Defaulting to features.27")
    target_layer = 'features.27'

# 1. Get Weights for 8x8 Conv
mod = dict(model.named_modules())[target_layer]

w_bit = 4
if hasattr(mod, 'weight_q'):
    weight_q = mod.weight_q.detach()
else:
    weight_q = mod.weight.detach()

print(mod.show_params())
w_alpha = 2.374
w_delta = w_alpha / ((2 ** (w_bit-1))-1)
weight_int = torch.round(weight_q / w_delta)
print("Weight Int shape:", weight_int.shape) # Should be [8, 8, 3, 3]
print(f"Weight Int Min: {weight_int.min()}, Max: {weight_int.max()}")

# 2. Get Input for 8x8 Conv
x_int = None
for name, val in save_output.outputs:
    if name == target_layer:
```

```
        x = val[0][0:1].detach()
        print(f"Found input for {target_layer}")
        break

if x is not None:
    x_bit = 4
    x_alpha = 4.564
    x_delta = x_alpha / ((2 ** x_bit)-1)

    # Quantize Input
    act_quant_fn = act_quantization(x_bit)
    x_q = act_quant_fn(x, x_alpha)
    x_int = torch.round(x_q / x_delta)
    print("Input Int shape:", x_int.shape) # Should be [Batch, 8, 4, 4]
    print(f"Input Int Min: {x_int.min()}, Max: {x_int.max()}")

if x_int is not None and weight_int is not None:
    # Prepare files
    f_a = open('activation_tile0.txt', 'w')
    f_o = open('out.txt', 'w')

    # Write Headers
    header = '#col0row7[msb-lsb],col0row6[msb-lsb],....,col0row0[msb-lsb]#\n'
    header += '#col1row7[msb-lsb],col1row6[msb-lsb],....,col1row0[msb-lsb]#\n'
    header += '#................#\n'
    f_a.write(header)
    f_o.write(header)

    bit_precision = 4

    # Pad Input for 3x3 convolution (padding=1)
    # x_int is [Batch, 8, 4, 4]
    x_padded = F.pad(x_int, (1, 1, 1, 1), "constant", 0) # [Batch, 8, 6, 6]

    # --- Write Activation (ONCE) ---
    # Flatten x_padded to [8, 36] (Channels, Spatial)
    # We want to write 36 lines, each with 8 channels.
    # The hardware expects the full 6x6 input map.
    X_full = x_padded[0].reshape(8, -1) # [8, 36]
    for t in range(X_full.size(1)): # 0 to 35
        for c in range(X_full.size(0)): # 0 to 7
            val = round(X_full[7-c, t].item()) # Descending channel order
            if val < 0:
                val = val + (1 << bit_precision)
            X_bin = '{0:04b}'.format(val)
            for k in range(bit_precision):
                f_a.write(X_bin[k])
```

```
        f_a.write('\n')
    f_a.close()
    print("Saved activation_tile0.txt")

    print("Generating weights for 3x3 convolution (9 files)...")

    # Loop over kernel positions (3x3)
    # We iterate ky, kx from 0 to 2
    kij = 0
    for ky in range(3):
        for kx in range(3):
            # Open specific weight file for this kij
            f_w = open(f'weight_itile0_otile0_kij{kij}.txt', 'w')
            f_w.write(header)

            # --- 1. Weights for this kernel position ---
            # weight_int is [Out, In, Ky, Kx]
            W = weight_int[:, :, ky, kx] # [Out, In]

            # Write W to f_w using HW_Code6 Logic
            # W is [8, 8] (Out, In) -> (Col, Row)
            for j in range(W.size(0)):  # column loop (outer)
                for i in range(W.size(1)): # row loop (inner)
                    val = round(W[j,7-i].item()) # Access Column j, Row (7-i)
                    if val < 0:
                        val = val + (1 << bit_precision)
                    W_bin = '{0:04b}'.format(val)
                    for k in range(bit_precision):
                        f_w.write(W_bin[k])
                f_w.write('\n')
            f_w.close()
            kij += 1

    print("Saved 9 weight files.")

    # --- 3. Expected Output ---
    # Calculate full 3x3 convolution
    out_int = F.conv2d(x_int, weight_int, padding=1)
    out_relu = F.relu(out_int)
    out_flat = out_relu[0].view(8, -1) # [8, 16] (Channels, Time)

    # Write out_flat to f_o using HW_Code6 Logic (psum.txt style)
    # out_flat is [8, 16] (Col, Time) - Channels are Columns in output
    bit_precision_out = 16
    for t in range(out_flat.size(1)): # Loop over time steps
        for c in range(out_flat.size(0)): # Loop over columns
            # Access columns in descending order: 7, 6, ..., 0
```

```
            val = round(out_flat[7-c, t].item())

            # 2's complement for negative numbers
            if val < 0:
                val = val + (1 << bit_precision_out)

            # Format to 16-bit binary string
            val_bin = '{0:016b}'.format(val)

            # Write bits
            for k in range(bit_precision_out):
                f_o.write(val_bin[k])

        f_o.write('\n') # New line after all columns for this time step

    print("Saved out.txt")

    f_o.close()
```

```
Found target layer: features.27 (In: 8, Out: 8)
clipping threshold weight alpha: 2.374000, activation alpha: 4.564000
None
Weight Int shape: torch.Size([8, 8, 3, 3])
Weight Int Min: -7.0, Max: 7.0
Found input for features.27
Input Int shape: torch.Size([1, 8, 4, 4])
Input Int Min: 0.0, Max: 13.0
Saved activation_tile0.txt
Generating weights for 3x3 convolution (9 files)…
Saved 9 weight files.
Saved out.txt
```

[ ]:
```
# Additionally , save a integers version as reference
f_w_int = open('weight_int.txt', 'w')
# Loop over kernel positions (3x3)
for ky in range(3):
    for kx in range(3):
        W = weight_int[:, :, ky, kx]
        for j in range(W.size(0)):  # column loop (outer)
            for i in range(W.size(1)): # row loop (inner)
                val = round(W[j,7-i].item()) # Access Column j, Row (7-i)
                f_w_int.write(f"{val} ")
            f_w_int.write('\n')
f_w_int.close()

f_x_int = open('activation_int.txt', 'w')
# Pad Input for 3x3 convolution (padding=1)
```

```
x_padded = F.pad(x_int, (1, 1, 1, 1), "constant", 0) # [Batch, 8, 6, 6]

# Write Activation (ONCE) - Full 6x6 map
X_full = x_padded[0].reshape(8, -1) # [8, 36]
for t in range(X_full.size(1)): # 0 to 35
    for c in range(X_full.size(0)): # 0 to 7
        val = round(X_full[7-c, t].item()) # Descending channel order
        f_x_int.write(f"{val} ")
    f_x_int.write('\n')
f_x_int.close()

f_o_int = open('out_int.txt', 'w')
# Calculate full 3x3 convolution
out_int = F.conv2d(x_int, weight_int, padding=1)
out_relu = F.relu(out_int)
out_flat = out_relu[0].view(8, -1) # [8, 16] (Channels, Time)
for t in range(out_flat.size(1)): # Loop over time steps
    for c in range(out_flat.size(0)): # Loop over columns
        # Access columns in descending order: 7, 6, ..., 0
        val = round(out_flat[7-c, t].item())
        f_o_int.write(f"{val} ")
    f_o_int.write('\n')
f_o_int.close()
print("Saved out_int.txt")
```

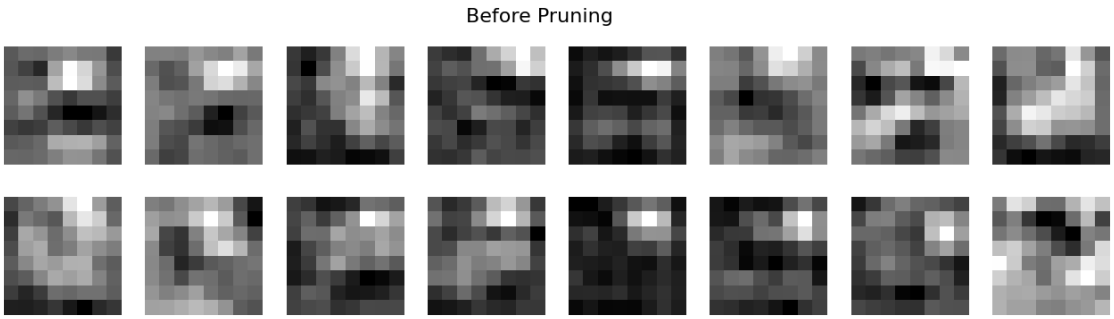
[14]:
```
# Simulate the 8x8 MAC array dataflow and compare with the PyTorch convolution␣
 ↪result
def simulate_mac_array(weight_tiles: torch.Tensor, input_tensor: torch.Tensor)␣
 ↪-> torch.Tensor:
    """Emulates the weight-stationary 8x8 array accumulating psums across the␣
 ↪3x3 kernel passes."""
    assert weight_tiles is not None and input_tensor is not None, "weight_int␣
 ↪and x_int must already be computed"
    assert weight_tiles.shape == (8, 8, 3, 3), "Expected weight tensor shaped␣
 ↪[8, 8, 3, 3]"

    x_pad = F.pad(input_tensor.to(torch.float32), (1, 1, 1, 1), "constant", 0) ␣
 ↪# [1, 8, 6, 6]
    psum = torch.zeros((weight_tiles.size(0), 16), dtype=torch.float32,␣
 ↪device=x_pad.device)
    weights_f32 = weight_tiles.to(torch.float32)
    time_len = 4 * 4  # 16 positions per pass

    for ky in range(3):
        for kx in range(3):
```

```
            w_tile = weights_f32[:, :, ky, kx]                              # [8␣
 ↪out, 8 in]
            x_slice = x_pad[:, :, ky:ky+4, kx:kx+4][0]                      # [8 in,␣
 ↪4, 4]
            x_stream = x_slice.reshape(weights_f32.size(1), time_len)  # [8 in,␣
 ↪16 time]
            psum += torch.matmul(w_tile, x_stream)                          #␣
 ↪accumulate partial sums
    return psum.to(torch.int32)

mac_psum = simulate_mac_array(weight_int, x_int)
mac_relu = torch.clamp(mac_psum, min=0)
ref_out = torch.round(out_flat).to(torch.int32)

diff = mac_relu - ref_out
max_err = diff.abs().max().item()
mismatches = (diff != 0).sum().item()

print(f"MAC-array simulation complete. Max abs error: {max_err}")
print(f"Total mismatched entries: {mismatches} / {diff.numel()}")
if mismatches:
    mismatch_idx = (diff != 0).nonzero(as_tuple=False)
    sample = mismatch_idx[:5]
    for idx in sample:
        c, t = idx.tolist()
        print(f"  Channel {c}, time {t}: sim={mac_relu[c, t].item()} vs␣
 ↪ref={ref_out[c, t].item()}")
else:
    print("All simulated outputs exactly match the PyTorch reference.")
```

```
MAC-array simulation complete. Max abs error: 0
Total mismatched entries: 0 / 128
All simulated outputs exactly match the PyTorch reference.
```

[29]:
```
dataiter = iter(testloader)
images, labels = next(dataiter)
sample_img = images[0].unsqueeze(0).cuda()

print("Visualizing 6th Conv Layer Feature Maps BEFORE Pruning:")
visualize_feature_maps(model, sample_img, layer_idx=6, title="Before Pruning")
```

```
Visualizing 6th Conv Layer Feature Maps BEFORE Pruning:
```



[6]:
```
# Apply Mixed Pruning of 70%
# This will apply 40% structured pruning followed by unstructured pruning to␣
 ↪reach ~70% total sparsity.
prune_model(model, amount=0.7, method='mixed')
##### Find "weight_int" for 6th layer ####
w_bit = 4
weight_q = model.features[17].weight_q
w_alpha = model.features[17].weight_quant.wgt_alpha
w_delta = w_alpha /(2**(w_bit-1)-1)

weight_int = weight_q / w_delta
# Show sparsity
sparsity_weight_int = (weight_int == 0).sum() / weight_int.nelement()
print("Sparsity level: ", sparsity_weight_int)
```

```
Applying mixed pruning with target amount=0.7…
Global sparsity achieved: 70.00%
Sparsity level:  tensor(0.1940, device='cuda:0')
```

[8]:
```
lr = 1e-3
weight_decay = 1e-6
epochs = 1000
best_prec = 0
# momentum = 0.9
#model = nn.DataParallel(model).cuda()
model.cuda()
criterion = nn.CrossEntropyLoss(label_smoothing=0.1).cuda()
# optimizer = torch.optim.SGD(model.parameters(), lr=lr, momentum=0.9,␣
 ↪weight_decay=weight_decay)
optimizer = torch.optim.Adam(model.parameters(), lr=lr,␣
 ↪weight_decay=weight_decay)
cudnn.benchmark = True

from torch.optim.lr_scheduler import CosineAnnealingLR
scheduler = CosineAnnealingLR(
```

```
    optimizer,
    T_max=epochs,  # 500
    eta_min=1e-10,  # final LR
)



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):

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

    # evaluate on test set
    print("Validation starts")
    prec = 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))
    save_checkpoint({
        'epoch': epoch + 1,
        'state_dict': model.state_dict(),
        'best_prec': best_prec,
        'optimizer': optimizer.state_dict(),
    }, is_best, fdir)
    scheduler.step()
```

```
Epoch: [0][0/98]        Time 4.213 (4.213)      Data 4.189 (4.189)      Loss
0.9576 (0.9576)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.703 (3.703)      Loss 1.1602 (1.1602)    Prec 63.867%
(63.867%)
 * Prec 63.750%
best acc: 63.750000
Epoch: [1][0/98]        Time 3.974 (3.974)      Data 3.953 (3.953)      Loss
1.0087 (1.0087)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.468 (3.468)      Loss 1.1842 (1.1842)    Prec 61.914%
(61.914%)
 * Prec 63.020%
best acc: 63.750000
```

```
Epoch: [2][0/98]        Time 4.057 (4.057)      Data 3.945 (3.945)      Loss
0.9686 (0.9686)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.511 (3.511)      Loss 1.1822 (1.1822)    Prec 63.672%
(63.672%)
 * Prec 63.340%
best acc: 63.750000
Epoch: [3][0/98]        Time 3.946 (3.946)      Data 3.925 (3.925)      Loss
0.9837 (0.9837)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.372 (3.372)      Loss 1.1661 (1.1661)    Prec 64.062%
(64.062%)
 * Prec 63.680%
best acc: 63.750000
Epoch: [4][0/98]        Time 3.943 (3.943)      Data 3.921 (3.921)      Loss
0.9901 (0.9901)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.474 (3.474)      Loss 1.1612 (1.1612)    Prec 64.258%
(64.258%)
 * Prec 64.260%
best acc: 64.260000
Epoch: [5][0/98]        Time 4.106 (4.106)      Data 4.086 (4.086)      Loss
0.9623 (0.9623)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.579 (3.579)      Loss 1.1655 (1.1655)    Prec 63.281%
(63.281%)
 * Prec 63.410%
best acc: 64.260000
Epoch: [6][0/98]        Time 3.939 (3.939)      Data 3.919 (3.919)      Loss
0.9639 (0.9639)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.585 (3.585)      Loss 1.1618 (1.1618)    Prec 63.672%
(63.672%)
 * Prec 64.090%
best acc: 64.260000
Epoch: [7][0/98]        Time 4.135 (4.135)      Data 4.113 (4.113)      Loss
0.9702 (0.9702)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.479 (3.479)      Loss 1.1583 (1.1583)    Prec 63.867%
(63.867%)
 * Prec 63.670%
best acc: 64.260000
Epoch: [8][0/98]        Time 4.069 (4.069)      Data 4.046 (4.046)      Loss
0.9767 (0.9767)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.647 (3.647)      Loss 1.1538 (1.1538)    Prec 63.086%
(63.086%)
 * Prec 63.440%
```

```
best acc: 64.260000
Epoch: [9][0/98]        Time 4.023 (4.023)      Data 4.000 (4.000)      Loss
0.9909 (0.9909)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.640 (3.640)      Loss 1.1903 (1.1903)    Prec 63.086%
(63.086%)
 * Prec 64.210%
best acc: 64.260000
Epoch: [10][0/98]       Time 4.119 (4.119)      Data 4.097 (4.097)      Loss
1.0246 (1.0246)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.459 (3.459)      Loss 1.1536 (1.1536)    Prec 63.672%
(63.672%)
 * Prec 64.020%
best acc: 64.260000
Epoch: [11][0/98]       Time 3.858 (3.858)      Data 3.836 (3.836)      Loss
0.9476 (0.9476)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.423 (3.423)      Loss 1.1756 (1.1756)    Prec 61.523%
(61.523%)
 * Prec 62.950%
best acc: 64.260000
Epoch: [12][0/98]       Time 3.886 (3.886)      Data 3.864 (3.864)      Loss
1.0088 (1.0088)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.445 (3.445)      Loss 1.1684 (1.1684)    Prec 64.844%
(64.844%)
 * Prec 63.700%
best acc: 64.260000
Epoch: [13][0/98]       Time 3.966 (3.966)      Data 3.945 (3.945)      Loss
0.9722 (0.9722)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.393 (3.393)      Loss 1.1457 (1.1457)    Prec 62.891%
(62.891%)
 * Prec 63.730%
best acc: 64.260000
Epoch: [14][0/98]       Time 3.939 (3.939)      Data 3.916 (3.916)      Loss
0.9749 (0.9749)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.423 (3.423)      Loss 1.1522 (1.1522)    Prec 63.477%
(63.477%)
 * Prec 63.500%
best acc: 64.260000
Epoch: [15][0/98]       Time 3.946 (3.946)      Data 3.924 (3.924)      Loss
0.9583 (0.9583)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.472 (3.472)      Loss 1.1962 (1.1962)    Prec 64.258%
(64.258%)
```

```
 * Prec 62.900%
best acc: 64.260000
Epoch: [16][0/98]       Time 4.148 (4.148)      Data 4.125 (4.125)      Loss
1.0289 (1.0289)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.528 (3.528)      Loss 1.1537 (1.1537)    Prec 63.867%
(63.867%)
 * Prec 64.350%
best acc: 64.350000
Epoch: [17][0/98]       Time 4.134 (4.134)      Data 4.111 (4.111)      Loss
0.9811 (0.9811)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.443 (3.443)      Loss 1.1592 (1.1592)    Prec 62.891%
(62.891%)
 * Prec 63.670%
best acc: 64.350000
Epoch: [18][0/98]       Time 4.033 (4.033)      Data 4.012 (4.012)      Loss
1.0078 (1.0078)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.387 (3.387)      Loss 1.1750 (1.1750)    Prec 63.086%
(63.086%)
 * Prec 63.710%
best acc: 64.350000
Epoch: [19][0/98]       Time 3.925 (3.925)      Data 3.903 (3.903)      Loss
1.0359 (1.0359)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.583 (3.583)      Loss 1.1772 (1.1772)    Prec 63.281%
(63.281%)
 * Prec 63.390%
best acc: 64.350000
Epoch: [20][0/98]       Time 3.990 (3.990)      Data 3.969 (3.969)      Loss
0.9336 (0.9336)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.578 (3.578)      Loss 1.1537 (1.1537)    Prec 64.062%
(64.062%)
 * Prec 63.700%
best acc: 64.350000
Epoch: [21][0/98]       Time 4.051 (4.051)      Data 4.029 (4.029)      Loss
0.9995 (0.9995)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.628 (3.628)      Loss 1.1551 (1.1551)    Prec 64.453%
(64.453%)
 * Prec 64.040%
best acc: 64.350000
Epoch: [22][0/98]       Time 4.042 (4.042)      Data 4.020 (4.020)      Loss
0.9605 (0.9605)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1610 (1.1610)    Prec 64.062%
```

```
(64.062%)
 * Prec 64.000%
best acc: 64.350000
Epoch: [23][0/98]       Time 4.007 (4.007)      Data 3.985 (3.985)      Loss
0.9511 (0.9511)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.571 (3.571)      Loss 1.1759 (1.1759)    Prec 62.891%
(62.891%)
 * Prec 63.610%
best acc: 64.350000
Epoch: [24][0/98]       Time 3.928 (3.928)      Data 3.906 (3.906)      Loss
1.0011 (1.0011)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.437 (3.437)      Loss 1.1733 (1.1733)    Prec 64.648%
(64.648%)
 * Prec 63.290%
best acc: 64.350000
Epoch: [25][0/98]       Time 3.986 (3.986)      Data 3.878 (3.878)      Loss
0.9939 (0.9939)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.411 (3.411)      Loss 1.1546 (1.1546)    Prec 64.258%
(64.258%)
 * Prec 64.170%
best acc: 64.350000
Epoch: [26][0/98]       Time 3.872 (3.872)      Data 3.850 (3.850)      Loss
0.9729 (0.9729)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.365 (3.365)      Loss 1.1660 (1.1660)    Prec 65.625%
(65.625%)
 * Prec 63.800%
best acc: 64.350000
Epoch: [27][0/98]       Time 3.941 (3.941)      Data 3.920 (3.920)      Loss
0.9623 (0.9623)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.363 (3.363)      Loss 1.1724 (1.1724)    Prec 63.867%
(63.867%)
 * Prec 64.270%
best acc: 64.350000
Epoch: [28][0/98]       Time 3.882 (3.882)      Data 3.861 (3.861)      Loss
1.0213 (1.0213)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.462 (3.462)      Loss 1.1831 (1.1831)    Prec 63.477%
(63.477%)
 * Prec 63.710%
best acc: 64.350000
Epoch: [29][0/98]       Time 4.000 (4.000)      Data 3.897 (3.897)      Loss
0.9515 (0.9515)    Prec 70.508% (70.508%)
Validation starts
```

```
Test: [0/20]    Time 3.447 (3.447)      Loss 1.1739 (1.1739)    Prec 62.695%
(62.695%)
 * Prec 63.750%
best acc: 64.350000
Epoch: [30][0/98]       Time 3.979 (3.979)      Data 3.880 (3.880)      Loss
0.9520 (0.9520)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.444 (3.444)      Loss 1.1448 (1.1448)    Prec 65.430%
(65.430%)
 * Prec 64.190%
best acc: 64.350000
Epoch: [31][0/98]       Time 3.927 (3.927)      Data 3.905 (3.905)      Loss
0.9838 (0.9838)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.427 (3.427)      Loss 1.1304 (1.1304)    Prec 63.672%
(63.672%)
 * Prec 64.140%
best acc: 64.350000
Epoch: [32][0/98]       Time 3.924 (3.924)      Data 3.902 (3.902)      Loss
1.0323 (1.0323)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.333 (3.333)      Loss 1.1341 (1.1341)    Prec 66.016%
(66.016%)
 * Prec 64.140%
best acc: 64.350000
Epoch: [33][0/98]       Time 4.011 (4.011)      Data 3.989 (3.989)      Loss
0.9921 (0.9921)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1191 (1.1191)    Prec 64.844%
(64.844%)
 * Prec 64.440%
best acc: 64.440000
Epoch: [34][0/98]       Time 3.984 (3.984)      Data 3.964 (3.964)      Loss
0.9576 (0.9576)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.446 (3.446)      Loss 1.1737 (1.1737)    Prec 62.891%
(62.891%)
 * Prec 63.280%
best acc: 64.440000
Epoch: [35][0/98]       Time 3.909 (3.909)      Data 3.887 (3.887)      Loss
0.9734 (0.9734)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.422 (3.422)      Loss 1.1668 (1.1668)    Prec 64.648%
(64.648%)
 * Prec 63.340%
best acc: 64.440000
Epoch: [36][0/98]       Time 3.871 (3.871)      Data 3.849 (3.849)      Loss
0.9534 (0.9534)    Prec 68.359% (68.359%)
```

```
Validation starts
Test: [0/20]    Time 3.375 (3.375)      Loss 1.1075 (1.1075)    Prec 64.648%
(64.648%)
 * Prec 63.640%
best acc: 64.440000
Epoch: [37][0/98]       Time 3.882 (3.882)      Data 3.861 (3.861)      Loss
1.0225 (1.0225)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.466 (3.466)      Loss 1.1736 (1.1736)    Prec 62.891%
(62.891%)
 * Prec 63.470%
best acc: 64.440000
Epoch: [38][0/98]       Time 4.017 (4.017)      Data 3.902 (3.902)      Loss
1.0000 (1.0000)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.348 (3.348)      Loss 1.1691 (1.1691)    Prec 63.672%
(63.672%)
 * Prec 64.090%
best acc: 64.440000
Epoch: [39][0/98]       Time 3.907 (3.907)      Data 3.886 (3.886)      Loss
0.9325 (0.9325)    Prec 74.609% (74.609%)
Validation starts
Test: [0/20]    Time 3.350 (3.350)      Loss 1.1598 (1.1598)    Prec 64.648%
(64.648%)
 * Prec 64.050%
best acc: 64.440000
Epoch: [40][0/98]       Time 3.873 (3.873)      Data 3.848 (3.848)      Loss
0.9132 (0.9132)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.322 (3.322)      Loss 1.1750 (1.1750)    Prec 62.891%
(62.891%)
 * Prec 63.710%
best acc: 64.440000
Epoch: [41][0/98]       Time 3.910 (3.910)      Data 3.890 (3.890)      Loss
1.0234 (1.0234)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.441 (3.441)      Loss 1.1381 (1.1381)    Prec 63.867%
(63.867%)
 * Prec 63.750%
best acc: 64.440000
Epoch: [42][0/98]       Time 3.905 (3.905)      Data 3.883 (3.883)      Loss
0.9515 (0.9515)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.340 (3.340)      Loss 1.1654 (1.1654)    Prec 63.477%
(63.477%)
 * Prec 64.370%
best acc: 64.440000
Epoch: [43][0/98]       Time 3.903 (3.903)      Data 3.881 (3.881)      Loss
```

```
0.9975 (0.9975)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.369 (3.369)      Loss 1.1391 (1.1391)    Prec 64.062%
(64.062%)
 * Prec 64.130%
best acc: 64.440000
Epoch: [44][0/98]       Time 3.887 (3.887)      Data 3.864 (3.864)      Loss
0.9515 (0.9515)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.466 (3.466)      Loss 1.1525 (1.1525)    Prec 65.430%
(65.430%)
 * Prec 64.520%
best acc: 64.520000
Epoch: [45][0/98]       Time 4.000 (4.000)      Data 3.886 (3.886)      Loss
0.9663 (0.9663)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.335 (3.335)      Loss 1.1453 (1.1453)    Prec 63.867%
(63.867%)
 * Prec 64.260%
best acc: 64.520000
Epoch: [46][0/98]       Time 3.869 (3.869)      Data 3.846 (3.846)      Loss
0.9950 (0.9950)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.336 (3.336)      Loss 1.1870 (1.1870)    Prec 64.062%
(64.062%)
 * Prec 64.190%
best acc: 64.520000
Epoch: [47][0/98]       Time 3.910 (3.910)      Data 3.887 (3.887)      Loss
0.9987 (0.9987)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.403 (3.403)      Loss 1.1871 (1.1871)    Prec 62.695%
(62.695%)
 * Prec 63.540%
best acc: 64.520000
Epoch: [48][0/98]       Time 3.899 (3.899)      Data 3.877 (3.877)      Loss
0.9978 (0.9978)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.382 (3.382)      Loss 1.1524 (1.1524)    Prec 63.672%
(63.672%)
 * Prec 63.600%
best acc: 64.520000
Epoch: [49][0/98]       Time 3.933 (3.933)      Data 3.911 (3.911)      Loss
1.0021 (1.0021)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.336 (3.336)      Loss 1.1541 (1.1541)    Prec 63.086%
(63.086%)
 * Prec 63.540%
best acc: 64.520000
```

```
Epoch: [50][0/98]       Time 3.814 (3.814)      Data 3.792 (3.792)      Loss
0.9690 (0.9690)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.302 (3.302)      Loss 1.1612 (1.1612)    Prec 64.062%
(64.062%)
 * Prec 63.950%
best acc: 64.520000
Epoch: [51][0/98]       Time 3.808 (3.808)      Data 3.787 (3.787)      Loss
0.9914 (0.9914)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.265 (3.265)      Loss 1.1534 (1.1534)    Prec 65.039%
(65.039%)
 * Prec 63.590%
best acc: 64.520000
Epoch: [52][0/98]       Time 3.835 (3.835)      Data 3.812 (3.812)      Loss
0.9845 (0.9845)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.238 (3.238)      Loss 1.1433 (1.1433)    Prec 63.086%
(63.086%)
 * Prec 63.400%
best acc: 64.520000
Epoch: [53][0/98]       Time 3.785 (3.785)      Data 3.764 (3.764)      Loss
1.0318 (1.0318)    Prec 64.258% (64.258%)
Validation starts
Test: [0/20]    Time 3.257 (3.257)      Loss 1.1927 (1.1927)    Prec 62.305%
(62.305%)
 * Prec 63.550%
best acc: 64.520000
Epoch: [54][0/98]       Time 3.793 (3.793)      Data 3.772 (3.772)      Loss
0.9701 (0.9701)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.269 (3.269)      Loss 1.1628 (1.1628)    Prec 63.086%
(63.086%)
 * Prec 63.560%
best acc: 64.520000
Epoch: [55][0/98]       Time 3.783 (3.783)      Data 3.761 (3.761)      Loss
0.9821 (0.9821)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.246 (3.246)      Loss 1.1664 (1.1664)    Prec 63.086%
(63.086%)
 * Prec 63.770%
best acc: 64.520000
Epoch: [56][0/98]       Time 3.813 (3.813)      Data 3.793 (3.793)      Loss
0.9917 (0.9917)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.255 (3.255)      Loss 1.1649 (1.1649)    Prec 63.867%
(63.867%)
 * Prec 63.310%
```

```
best acc: 64.520000
Epoch: [57][0/98]       Time 3.782 (3.782)      Data 3.761 (3.761)      Loss
0.9751 (0.9751)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.349 (3.349)      Loss 1.1718 (1.1718)    Prec 63.281%
(63.281%)
 * Prec 64.000%
best acc: 64.520000
Epoch: [58][0/98]       Time 3.825 (3.825)      Data 3.803 (3.803)      Loss
0.9719 (0.9719)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.290 (3.290)      Loss 1.1713 (1.1713)    Prec 64.062%
(64.062%)
 * Prec 64.040%
best acc: 64.520000
Epoch: [59][0/98]       Time 4.948 (4.948)      Data 4.925 (4.925)      Loss
0.9737 (0.9737)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 4.160 (4.160)      Loss 1.1250 (1.1250)    Prec 63.672%
(63.672%)
 * Prec 63.540%
best acc: 64.520000
Epoch: [60][0/98]       Time 5.395 (5.395)      Data 5.374 (5.374)      Loss
0.9710 (0.9710)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.712 (3.712)      Loss 1.1748 (1.1748)    Prec 62.109%
(62.109%)
 * Prec 63.520%
best acc: 64.520000
Epoch: [61][0/98]       Time 4.326 (4.326)      Data 4.305 (4.305)      Loss
0.9913 (0.9913)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.711 (3.711)      Loss 1.1535 (1.1535)    Prec 63.672%
(63.672%)
 * Prec 64.410%
best acc: 64.520000
Epoch: [62][0/98]       Time 4.311 (4.311)      Data 4.288 (4.288)      Loss
1.0062 (1.0062)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.693 (3.693)      Loss 1.1499 (1.1499)    Prec 63.672%
(63.672%)
 * Prec 64.380%
best acc: 64.520000
Epoch: [63][0/98]       Time 4.296 (4.296)      Data 4.272 (4.272)      Loss
0.9723 (0.9723)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.674 (3.674)      Loss 1.1603 (1.1603)    Prec 63.867%
(63.867%)
```

```
 * Prec 64.030%
best acc: 64.520000
Epoch: [64][0/98]       Time 4.318 (4.318)      Data 4.295 (4.295)      Loss
0.9836 (0.9836)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.711 (3.711)      Loss 1.1773 (1.1773)    Prec 64.648%
(64.648%)
 * Prec 63.710%
best acc: 64.520000
Epoch: [65][0/98]       Time 4.273 (4.273)      Data 4.251 (4.251)      Loss
1.0378 (1.0378)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.714 (3.714)      Loss 1.1499 (1.1499)    Prec 64.453%
(64.453%)
 * Prec 64.460%
best acc: 64.520000
Epoch: [66][0/98]       Time 4.278 (4.278)      Data 4.255 (4.255)      Loss
0.9647 (0.9647)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.711 (3.711)      Loss 1.1478 (1.1478)    Prec 64.648%
(64.648%)
 * Prec 64.000%
best acc: 64.520000
Epoch: [67][0/98]       Time 4.298 (4.298)      Data 4.274 (4.274)      Loss
0.9871 (0.9871)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.667 (3.667)      Loss 1.1784 (1.1784)    Prec 63.281%
(63.281%)
 * Prec 63.160%
best acc: 64.520000
Epoch: [68][0/98]       Time 4.331 (4.331)      Data 4.309 (4.309)      Loss
0.9828 (0.9828)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.711 (3.711)      Loss 1.1789 (1.1789)    Prec 63.281%
(63.281%)
 * Prec 64.250%
best acc: 64.520000
Epoch: [69][0/98]       Time 4.276 (4.276)      Data 4.253 (4.253)      Loss
1.0075 (1.0075)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.690 (3.690)      Loss 1.1576 (1.1576)    Prec 63.477%
(63.477%)
 * Prec 63.790%
best acc: 64.520000
Epoch: [70][0/98]       Time 4.282 (4.282)      Data 4.259 (4.259)      Loss
0.9810 (0.9810)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1673 (1.1673)    Prec 62.891%
```

```
(62.891%)
 * Prec 63.840%
best acc: 64.520000
Epoch: [71][0/98]       Time 4.250 (4.250)      Data 4.227 (4.227)      Loss
1.0095 (1.0095)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.683 (3.683)      Loss 1.1539 (1.1539)    Prec 64.258%
(64.258%)
 * Prec 64.220%
best acc: 64.520000
Epoch: [72][0/98]       Time 4.269 (4.269)      Data 4.247 (4.247)      Loss
1.0031 (1.0031)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1631 (1.1631)    Prec 64.258%
(64.258%)
 * Prec 64.390%
best acc: 64.520000
Epoch: [73][0/98]       Time 4.303 (4.303)      Data 4.278 (4.278)      Loss
1.0071 (1.0071)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.1802 (1.1802)    Prec 64.453%
(64.453%)
 * Prec 63.390%
best acc: 64.520000
Epoch: [74][0/98]       Time 4.388 (4.388)      Data 4.362 (4.362)      Loss
0.9799 (0.9799)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1506 (1.1506)    Prec 63.477%
(63.477%)
 * Prec 63.620%
best acc: 64.520000
Epoch: [75][0/98]       Time 4.271 (4.271)      Data 4.248 (4.248)      Loss
0.9961 (0.9961)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1510 (1.1510)    Prec 63.281%
(63.281%)
 * Prec 63.510%
best acc: 64.520000
Epoch: [76][0/98]       Time 4.248 (4.248)      Data 4.225 (4.225)      Loss
1.0351 (1.0351)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.633 (3.633)      Loss 1.1342 (1.1342)    Prec 65.039%
(65.039%)
 * Prec 64.640%
best acc: 64.640000
Epoch: [77][0/98]       Time 4.291 (4.291)      Data 4.269 (4.269)      Loss
0.9579 (0.9579)    Prec 69.531% (69.531%)
Validation starts
```

```
Test: [0/20]    Time 3.626 (3.626)      Loss 1.1752 (1.1752)    Prec 62.305%
(62.305%)
 * Prec 62.930%
best acc: 64.640000
Epoch: [78][0/98]       Time 4.280 (4.280)      Data 4.258 (4.258)      Loss
0.9759 (0.9759)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.705 (3.705)      Loss 1.1496 (1.1496)    Prec 63.672%
(63.672%)
 * Prec 63.530%
best acc: 64.640000
Epoch: [79][0/98]       Time 4.235 (4.235)      Data 4.212 (4.212)      Loss
0.9580 (0.9580)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.728 (3.728)      Loss 1.1717 (1.1717)    Prec 63.281%
(63.281%)
 * Prec 63.750%
best acc: 64.640000
Epoch: [80][0/98]       Time 4.301 (4.301)      Data 4.280 (4.280)      Loss
0.9471 (0.9471)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.622 (3.622)      Loss 1.1382 (1.1382)    Prec 64.062%
(64.062%)
 * Prec 64.450%
best acc: 64.640000
Epoch: [81][0/98]       Time 4.227 (4.227)      Data 4.204 (4.204)      Loss
0.9650 (0.9650)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.593 (3.593)      Loss 1.1698 (1.1698)    Prec 64.453%
(64.453%)
 * Prec 64.390%
best acc: 64.640000
Epoch: [82][0/98]       Time 4.293 (4.293)      Data 4.271 (4.271)      Loss
0.9637 (0.9637)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1638 (1.1638)    Prec 64.062%
(64.062%)
 * Prec 64.240%
best acc: 64.640000
Epoch: [83][0/98]       Time 4.244 (4.244)      Data 4.222 (4.222)      Loss
0.9241 (0.9241)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.641 (3.641)      Loss 1.1788 (1.1788)    Prec 64.844%
(64.844%)
 * Prec 63.790%
best acc: 64.640000
Epoch: [84][0/98]       Time 4.302 (4.302)      Data 4.279 (4.279)      Loss
1.0189 (1.0189)    Prec 64.844% (64.844%)
```

```
Validation starts
Test: [0/20]    Time 3.652 (3.652)      Loss 1.1760 (1.1760)    Prec 62.891%
(62.891%)
 * Prec 64.220%
best acc: 64.640000
Epoch: [85][0/98]       Time 4.227 (4.227)      Data 4.205 (4.205)      Loss
0.9535 (0.9535)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.669 (3.669)      Loss 1.1320 (1.1320)    Prec 63.672%
(63.672%)
 * Prec 62.920%
best acc: 64.640000
Epoch: [86][0/98]       Time 4.225 (4.225)      Data 4.203 (4.203)      Loss
0.9501 (0.9501)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.638 (3.638)      Loss 1.1352 (1.1352)    Prec 63.867%
(63.867%)
 * Prec 63.340%
best acc: 64.640000
Epoch: [87][0/98]       Time 4.222 (4.222)      Data 4.199 (4.199)      Loss
0.9832 (0.9832)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1841 (1.1841)    Prec 64.844%
(64.844%)
 * Prec 63.830%
best acc: 64.640000
Epoch: [88][0/98]       Time 4.227 (4.227)      Data 4.201 (4.201)      Loss
0.9687 (0.9687)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1599 (1.1599)    Prec 64.062%
(64.062%)
 * Prec 63.920%
best acc: 64.640000
Epoch: [89][0/98]       Time 4.298 (4.298)      Data 4.275 (4.275)      Loss
0.9851 (0.9851)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.1579 (1.1579)    Prec 63.281%
(63.281%)
 * Prec 64.130%
best acc: 64.640000
Epoch: [90][0/98]       Time 4.228 (4.228)      Data 4.207 (4.207)      Loss
0.9897 (0.9897)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1751 (1.1751)    Prec 63.086%
(63.086%)
 * Prec 64.170%
best acc: 64.640000
Epoch: [91][0/98]       Time 4.221 (4.221)      Data 4.198 (4.198)      Loss
```

```
0.9595 (0.9595)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.576 (3.576)      Loss 1.1686 (1.1686)    Prec 63.672%
(63.672%)
 * Prec 64.540%
best acc: 64.640000
Epoch: [92][0/98]       Time 4.239 (4.239)      Data 4.217 (4.217)      Loss
1.0042 (1.0042)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.651 (3.651)      Loss 1.1766 (1.1766)    Prec 63.672%
(63.672%)
 * Prec 64.290%
best acc: 64.640000
Epoch: [93][0/98]       Time 4.240 (4.240)      Data 4.215 (4.215)      Loss
0.9908 (0.9908)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.1661 (1.1661)    Prec 63.281%
(63.281%)
 * Prec 63.790%
best acc: 64.640000
Epoch: [94][0/98]       Time 4.292 (4.292)      Data 4.270 (4.270)      Loss
0.9716 (0.9716)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.655 (3.655)      Loss 1.1517 (1.1517)    Prec 64.062%
(64.062%)
 * Prec 63.560%
best acc: 64.640000
Epoch: [95][0/98]       Time 4.248 (4.248)      Data 4.226 (4.226)      Loss
0.9236 (0.9236)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.631 (3.631)      Loss 1.1768 (1.1768)    Prec 62.695%
(62.695%)
 * Prec 64.030%
best acc: 64.640000
Epoch: [96][0/98]       Time 4.277 (4.277)      Data 4.255 (4.255)      Loss
0.9620 (0.9620)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.730 (3.730)      Loss 1.1819 (1.1819)    Prec 64.062%
(64.062%)
 * Prec 64.250%
best acc: 64.640000
Epoch: [97][0/98]       Time 4.226 (4.226)      Data 4.205 (4.205)      Loss
0.9741 (0.9741)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1790 (1.1790)    Prec 64.062%
(64.062%)
 * Prec 64.030%
best acc: 64.640000
```

```
Epoch: [98][0/98]       Time 4.215 (4.215)      Data 4.191 (4.191)      Loss
0.9333 (0.9333)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1736 (1.1736)    Prec 62.891%
(62.891%)
 * Prec 63.730%
best acc: 64.640000
Epoch: [99][0/98]       Time 4.231 (4.231)      Data 4.208 (4.208)      Loss
0.9635 (0.9635)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.641 (3.641)      Loss 1.1824 (1.1824)    Prec 63.477%
(63.477%)
 * Prec 63.850%
best acc: 64.640000
Epoch: [100][0/98]      Time 4.242 (4.242)      Data 4.220 (4.220)      Loss
0.9782 (0.9782)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.656 (3.656)      Loss 1.1622 (1.1622)    Prec 64.062%
(64.062%)
 * Prec 64.390%
best acc: 64.640000
Epoch: [101][0/98]      Time 4.288 (4.288)      Data 4.262 (4.262)      Loss
0.9761 (0.9761)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.634 (3.634)      Loss 1.1992 (1.1992)    Prec 61.914%
(61.914%)
 * Prec 63.700%
best acc: 64.640000
Epoch: [102][0/98]      Time 4.229 (4.229)      Data 4.205 (4.205)      Loss
1.0398 (1.0398)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.656 (3.656)      Loss 1.2336 (1.2336)    Prec 60.742%
(60.742%)
 * Prec 63.020%
best acc: 64.640000
Epoch: [103][0/98]      Time 4.293 (4.293)      Data 4.271 (4.271)      Loss
0.9917 (0.9917)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.654 (3.654)      Loss 1.1463 (1.1463)    Prec 62.695%
(62.695%)
 * Prec 63.360%
best acc: 64.640000
Epoch: [104][0/98]      Time 4.187 (4.187)      Data 4.163 (4.163)      Loss
0.9804 (0.9804)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.625 (3.625)      Loss 1.1434 (1.1434)    Prec 64.258%
(64.258%)
 * Prec 63.670%
```

```
best acc: 64.640000
Epoch: [105][0/98]      Time 4.227 (4.227)      Data 4.201 (4.201)      Loss
0.9577 (0.9577)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1548 (1.1548)    Prec 63.867%
(63.867%)
 * Prec 64.390%
best acc: 64.640000
Epoch: [106][0/98]      Time 4.198 (4.198)      Data 4.172 (4.172)      Loss
0.9711 (0.9711)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1684 (1.1684)    Prec 62.500%
(62.500%)
 * Prec 63.640%
best acc: 64.640000
Epoch: [107][0/98]      Time 4.184 (4.184)      Data 4.163 (4.163)      Loss
0.9865 (0.9865)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1644 (1.1644)    Prec 63.867%
(63.867%)
 * Prec 63.770%
best acc: 64.640000
Epoch: [108][0/98]      Time 4.164 (4.164)      Data 4.142 (4.142)      Loss
0.9698 (0.9698)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1567 (1.1567)    Prec 64.844%
(64.844%)
 * Prec 64.130%
best acc: 64.640000
Epoch: [109][0/98]      Time 4.200 (4.200)      Data 4.177 (4.177)      Loss
0.9280 (0.9280)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1159 (1.1159)    Prec 65.625%
(65.625%)
 * Prec 64.740%
best acc: 64.740000
Epoch: [110][0/98]      Time 4.227 (4.227)      Data 4.204 (4.204)      Loss
0.9688 (0.9688)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.572 (3.572)      Loss 1.1422 (1.1422)    Prec 64.062%
(64.062%)
 * Prec 64.470%
best acc: 64.740000
Epoch: [111][0/98]      Time 4.192 (4.192)      Data 4.169 (4.169)      Loss
0.9497 (0.9497)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.1592 (1.1592)    Prec 64.062%
(64.062%)
```

```
 * Prec 63.810%
best acc: 64.740000
Epoch: [112][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9666 (0.9666)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.618 (3.618)      Loss 1.1353 (1.1353)    Prec 63.867%
(63.867%)
 * Prec 63.710%
best acc: 64.740000
Epoch: [113][0/98]      Time 4.190 (4.190)      Data 4.169 (4.169)      Loss
0.9594 (0.9594)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.602 (3.602)      Loss 1.1623 (1.1623)    Prec 64.453%
(64.453%)
 * Prec 64.800%
best acc: 64.800000
Epoch: [114][0/98]      Time 4.120 (4.120)      Data 4.097 (4.097)      Loss
0.9702 (0.9702)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.371 (3.371)      Loss 1.1856 (1.1856)    Prec 63.477%
(63.477%)
 * Prec 64.660%
best acc: 64.800000
Epoch: [115][0/98]      Time 4.182 (4.182)      Data 4.155 (4.155)      Loss
0.9772 (0.9772)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.848 (3.848)      Loss 1.1632 (1.1632)    Prec 63.281%
(63.281%)
 * Prec 64.130%
best acc: 64.800000
Epoch: [116][0/98]      Time 4.270 (4.270)      Data 4.248 (4.248)      Loss
0.9924 (0.9924)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.918 (3.918)      Loss 1.2072 (1.2072)    Prec 61.719%
(61.719%)
 * Prec 63.360%
best acc: 64.800000
Epoch: [117][0/98]      Time 4.566 (4.566)      Data 4.544 (4.544)      Loss
1.0242 (1.0242)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 4.318 (4.318)      Loss 1.1957 (1.1957)    Prec 62.695%
(62.695%)
 * Prec 63.520%
best acc: 64.800000
Epoch: [118][0/98]      Time 4.546 (4.546)      Data 4.524 (4.524)      Loss
0.9863 (0.9863)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.775 (3.775)      Loss 1.1750 (1.1750)    Prec 63.086%
```

```
(63.086%)
 * Prec 63.410%
best acc: 64.800000
Epoch: [119][0/98]      Time 4.363 (4.363)      Data 4.341 (4.341)      Loss
0.9787 (0.9787)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.796 (3.796)      Loss 1.1654 (1.1654)    Prec 62.695%
(62.695%)
 * Prec 63.590%
best acc: 64.800000
Epoch: [120][0/98]      Time 4.347 (4.347)      Data 4.325 (4.325)      Loss
1.0218 (1.0218)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.818 (3.818)      Loss 1.1629 (1.1629)    Prec 63.477%
(63.477%)
 * Prec 63.320%
best acc: 64.800000
Epoch: [121][0/98]      Time 4.319 (4.319)      Data 4.296 (4.296)      Loss
0.9852 (0.9852)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.739 (3.739)      Loss 1.1813 (1.1813)    Prec 64.062%
(64.062%)
 * Prec 64.150%
best acc: 64.800000
Epoch: [122][0/98]      Time 4.845 (4.845)      Data 4.822 (4.822)      Loss
0.9803 (0.9803)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 4.125 (4.125)      Loss 1.1515 (1.1515)    Prec 64.453%
(64.453%)
 * Prec 64.550%
best acc: 64.800000
Epoch: [123][0/98]      Time 4.355 (4.355)      Data 4.334 (4.334)      Loss
0.9730 (0.9730)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1554 (1.1554)    Prec 66.016%
(66.016%)
 * Prec 64.180%
best acc: 64.800000
Epoch: [124][0/98]      Time 3.829 (3.829)      Data 3.809 (3.809)      Loss
0.9579 (0.9579)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.454 (3.454)      Loss 1.1514 (1.1514)    Prec 64.648%
(64.648%)
 * Prec 64.410%
best acc: 64.800000
Epoch: [125][0/98]      Time 3.962 (3.962)      Data 3.864 (3.864)      Loss
0.9486 (0.9486)    Prec 69.727% (69.727%)
Validation starts
```

```
Test: [0/20]    Time 3.424 (3.424)      Loss 1.1599 (1.1599)    Prec 62.891%
(62.891%)
 * Prec 63.530%
best acc: 64.800000
Epoch: [126][0/98]      Time 4.090 (4.090)      Data 4.068 (4.068)      Loss
0.9485 (0.9485)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.391 (3.391)      Loss 1.1463 (1.1463)    Prec 62.891%
(62.891%)
 * Prec 63.440%
best acc: 64.800000
Epoch: [127][0/98]      Time 3.869 (3.869)      Data 3.847 (3.847)      Loss
0.9498 (0.9498)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.366 (3.366)      Loss 1.1391 (1.1391)    Prec 65.234%
(65.234%)
 * Prec 64.710%
best acc: 64.800000
Epoch: [128][0/98]      Time 3.858 (3.858)      Data 3.837 (3.837)      Loss
0.9427 (0.9427)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.301 (3.301)      Loss 1.1774 (1.1774)    Prec 64.062%
(64.062%)
 * Prec 64.070%
best acc: 64.800000
Epoch: [129][0/98]      Time 3.880 (3.880)      Data 3.859 (3.859)      Loss
0.9510 (0.9510)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.298 (3.298)      Loss 1.1800 (1.1800)    Prec 63.672%
(63.672%)
 * Prec 64.110%
best acc: 64.800000
Epoch: [130][0/98]      Time 3.952 (3.952)      Data 3.932 (3.932)      Loss
0.9495 (0.9495)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.496 (3.496)      Loss 1.1457 (1.1457)    Prec 63.672%
(63.672%)
 * Prec 64.320%
best acc: 64.800000
Epoch: [131][0/98]      Time 3.927 (3.927)      Data 3.904 (3.904)      Loss
0.9804 (0.9804)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.508 (3.508)      Loss 1.1744 (1.1744)    Prec 63.477%
(63.477%)
 * Prec 64.210%
best acc: 64.800000
Epoch: [132][0/98]      Time 4.056 (4.056)      Data 4.035 (4.035)      Loss
0.9094 (0.9094)    Prec 72.266% (72.266%)
```

```
Validation starts
Test: [0/20]    Time 3.461 (3.461)      Loss 1.1822 (1.1822)    Prec 62.500%
(62.500%)
 * Prec 63.460%
best acc: 64.800000
Epoch: [133][0/98]      Time 4.056 (4.056)      Data 4.035 (4.035)      Loss
0.9562 (0.9562)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1423 (1.1423)    Prec 64.258%
(64.258%)
 * Prec 63.680%
best acc: 64.800000
Epoch: [134][0/98]      Time 4.109 (4.109)      Data 4.087 (4.087)      Loss
0.9660 (0.9660)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.1524 (1.1524)    Prec 65.234%
(65.234%)
 * Prec 64.650%
best acc: 64.800000
Epoch: [135][0/98]      Time 4.111 (4.111)      Data 4.087 (4.087)      Loss
0.9846 (0.9846)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.511 (3.511)      Loss 1.2113 (1.2113)    Prec 62.305%
(62.305%)
 * Prec 63.630%
best acc: 64.800000
Epoch: [136][0/98]      Time 4.115 (4.115)      Data 4.091 (4.091)      Loss
0.9922 (0.9922)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.569 (3.569)      Loss 1.1876 (1.1876)    Prec 62.695%
(62.695%)
 * Prec 63.660%
best acc: 64.800000
Epoch: [137][0/98]      Time 4.090 (4.090)      Data 4.066 (4.066)      Loss
0.9703 (0.9703)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.483 (3.483)      Loss 1.2009 (1.2009)    Prec 63.477%
(63.477%)
 * Prec 63.690%
best acc: 64.800000
Epoch: [138][0/98]      Time 4.058 (4.058)      Data 4.037 (4.037)      Loss
0.9998 (0.9998)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.468 (3.468)      Loss 1.2091 (1.2091)    Prec 62.109%
(62.109%)
 * Prec 62.740%
best acc: 64.800000
Epoch: [139][0/98]      Time 4.047 (4.047)      Data 4.024 (4.024)      Loss
```

```
1.0179 (1.0179)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.555 (3.555)      Loss 1.1626 (1.1626)    Prec 66.211%
(66.211%)
 * Prec 64.350%
best acc: 64.800000
Epoch: [140][0/98]      Time 4.059 (4.059)      Data 4.036 (4.036)      Loss
0.9462 (0.9462)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.473 (3.473)      Loss 1.1944 (1.1944)    Prec 64.062%
(64.062%)
 * Prec 63.940%
best acc: 64.800000
Epoch: [141][0/98]      Time 4.066 (4.066)      Data 4.044 (4.044)      Loss
0.9530 (0.9530)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.521 (3.521)      Loss 1.1790 (1.1790)    Prec 64.258%
(64.258%)
 * Prec 63.640%
best acc: 64.800000
Epoch: [142][0/98]      Time 4.058 (4.058)      Data 4.036 (4.036)      Loss
0.9507 (0.9507)    Prec 74.414% (74.414%)
Validation starts
Test: [0/20]    Time 3.468 (3.468)      Loss 1.1734 (1.1734)    Prec 62.695%
(62.695%)
 * Prec 63.450%
best acc: 64.800000
Epoch: [143][0/98]      Time 4.207 (4.207)      Data 4.184 (4.184)      Loss
1.0145 (1.0145)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.424 (3.424)      Loss 1.1824 (1.1824)    Prec 64.062%
(64.062%)
 * Prec 64.090%
best acc: 64.800000
Epoch: [144][0/98]      Time 3.905 (3.905)      Data 3.882 (3.882)      Loss
0.9412 (0.9412)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.451 (3.451)      Loss 1.1689 (1.1689)    Prec 64.453%
(64.453%)
 * Prec 63.810%
best acc: 64.800000
Epoch: [145][0/98]      Time 3.990 (3.990)      Data 3.873 (3.873)      Loss
0.9786 (0.9786)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.318 (3.318)      Loss 1.1702 (1.1702)    Prec 63.867%
(63.867%)
 * Prec 64.290%
best acc: 64.800000
```

```
Epoch: [146][0/98]      Time 3.950 (3.950)      Data 3.929 (3.929)      Loss
0.9734 (0.9734)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.451 (3.451)      Loss 1.1675 (1.1675)    Prec 63.477%
(63.477%)
 * Prec 64.600%
best acc: 64.800000
Epoch: [147][0/98]      Time 3.896 (3.896)      Data 3.874 (3.874)      Loss
1.0052 (1.0052)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1663 (1.1663)    Prec 63.477%
(63.477%)
 * Prec 64.140%
best acc: 64.800000
Epoch: [148][0/98]      Time 3.901 (3.901)      Data 3.880 (3.880)      Loss
1.0349 (1.0349)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.367 (3.367)      Loss 1.1526 (1.1526)    Prec 63.477%
(63.477%)
 * Prec 63.390%
best acc: 64.800000
Epoch: [149][0/98]      Time 3.857 (3.857)      Data 3.836 (3.836)      Loss
0.9930 (0.9930)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.492 (3.492)      Loss 1.1314 (1.1314)    Prec 65.234%
(65.234%)
 * Prec 64.470%
best acc: 64.800000
Epoch: [150][0/98]      Time 3.858 (3.858)      Data 3.838 (3.838)      Loss
0.9779 (0.9779)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.277 (3.277)      Loss 1.1745 (1.1745)    Prec 63.672%
(63.672%)
 * Prec 64.280%
best acc: 64.800000
Epoch: [151][0/98]      Time 3.828 (3.828)      Data 3.807 (3.807)      Loss
1.0112 (1.0112)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.330 (3.330)      Loss 1.1511 (1.1511)    Prec 63.086%
(63.086%)
 * Prec 63.560%
best acc: 64.800000
Epoch: [152][0/98]      Time 3.866 (3.866)      Data 3.844 (3.844)      Loss
0.9937 (0.9937)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.316 (3.316)      Loss 1.1678 (1.1678)    Prec 63.867%
(63.867%)
 * Prec 64.050%
```

```
best acc: 64.800000
Epoch: [153][0/98]      Time 3.966 (3.966)      Data 3.945 (3.945)      Loss
1.0060 (1.0060)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.333 (3.333)      Loss 1.1863 (1.1863)    Prec 62.500%
(62.500%)
 * Prec 63.980%
best acc: 64.800000
Epoch: [154][0/98]      Time 3.907 (3.907)      Data 3.886 (3.886)      Loss
1.0182 (1.0182)    Prec 65.039% (65.039%)
Validation starts
Test: [0/20]    Time 3.331 (3.331)      Loss 1.1547 (1.1547)    Prec 66.406%
(66.406%)
 * Prec 63.780%
best acc: 64.800000
Epoch: [155][0/98]      Time 3.905 (3.905)      Data 3.884 (3.884)      Loss
0.9850 (0.9850)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.438 (3.438)      Loss 1.1407 (1.1407)    Prec 64.453%
(64.453%)
 * Prec 63.630%
best acc: 64.800000
Epoch: [156][0/98]      Time 3.923 (3.923)      Data 3.902 (3.902)      Loss
1.0145 (1.0145)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.386 (3.386)      Loss 1.1530 (1.1530)    Prec 64.453%
(64.453%)
 * Prec 64.480%
best acc: 64.800000
Epoch: [157][0/98]      Time 3.903 (3.903)      Data 3.881 (3.881)      Loss
0.9765 (0.9765)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.367 (3.367)      Loss 1.1558 (1.1558)    Prec 63.672%
(63.672%)
 * Prec 64.330%
best acc: 64.800000
Epoch: [158][0/98]      Time 3.913 (3.913)      Data 3.891 (3.891)      Loss
0.9476 (0.9476)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.415 (3.415)      Loss 1.1597 (1.1597)    Prec 63.672%
(63.672%)
 * Prec 64.390%
best acc: 64.800000
Epoch: [159][0/98]      Time 3.896 (3.896)      Data 3.874 (3.874)      Loss
0.9430 (0.9430)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.382 (3.382)      Loss 1.1448 (1.1448)    Prec 63.867%
(63.867%)
```

```
 * Prec 64.590%
best acc: 64.800000
Epoch: [160][0/98]      Time 3.900 (3.900)      Data 3.879 (3.879)      Loss
1.0048 (1.0048)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.375 (3.375)      Loss 1.1158 (1.1158)    Prec 65.039%
(65.039%)
 * Prec 64.630%
best acc: 64.800000
Epoch: [161][0/98]      Time 3.910 (3.910)      Data 3.888 (3.888)      Loss
0.9398 (0.9398)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.463 (3.463)      Loss 1.1262 (1.1262)    Prec 64.648%
(64.648%)
 * Prec 63.940%
best acc: 64.800000
Epoch: [162][0/98]      Time 3.986 (3.986)      Data 3.869 (3.869)      Loss
0.9983 (0.9983)    Prec 65.430% (65.430%)
Validation starts
Test: [0/20]    Time 3.376 (3.376)      Loss 1.1583 (1.1583)    Prec 63.672%
(63.672%)
 * Prec 64.120%
best acc: 64.800000
Epoch: [163][0/98]      Time 3.916 (3.916)      Data 3.894 (3.894)      Loss
0.9564 (0.9564)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.461 (3.461)      Loss 1.1681 (1.1681)    Prec 64.844%
(64.844%)
 * Prec 64.260%
best acc: 64.800000
Epoch: [164][0/98]      Time 3.941 (3.941)      Data 3.919 (3.919)      Loss
1.0145 (1.0145)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.459 (3.459)      Loss 1.1741 (1.1741)    Prec 62.891%
(62.891%)
 * Prec 64.260%
best acc: 64.800000
Epoch: [165][0/98]      Time 3.886 (3.886)      Data 3.862 (3.862)      Loss
0.9589 (0.9589)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.383 (3.383)      Loss 1.1812 (1.1812)    Prec 63.086%
(63.086%)
 * Prec 64.060%
best acc: 64.800000
Epoch: [166][0/98]      Time 3.914 (3.914)      Data 3.892 (3.892)      Loss
1.0254 (1.0254)    Prec 64.648% (64.648%)
Validation starts
Test: [0/20]    Time 3.409 (3.409)      Loss 1.1828 (1.1828)    Prec 64.648%
```

```
(64.648%)
 * Prec 63.600%
best acc: 64.800000
Epoch: [167][0/98]      Time 3.961 (3.961)      Data 3.938 (3.938)      Loss
1.0120 (1.0120)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.440 (3.440)      Loss 1.1690 (1.1690)    Prec 63.867%
(63.867%)
 * Prec 63.820%
best acc: 64.800000
Epoch: [168][0/98]      Time 4.142 (4.142)      Data 4.119 (4.119)      Loss
0.9242 (0.9242)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.432 (3.432)      Loss 1.1774 (1.1774)    Prec 63.867%
(63.867%)
 * Prec 64.370%
best acc: 64.800000
Epoch: [169][0/98]      Time 3.924 (3.924)      Data 3.902 (3.902)      Loss
0.9429 (0.9429)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.430 (3.430)      Loss 1.1618 (1.1618)    Prec 63.672%
(63.672%)
 * Prec 64.150%
best acc: 64.800000
Epoch: [170][0/98]      Time 4.041 (4.041)      Data 4.020 (4.020)      Loss
0.9701 (0.9701)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.391 (3.391)      Loss 1.1824 (1.1824)    Prec 63.672%
(63.672%)
 * Prec 64.110%
best acc: 64.800000
Epoch: [171][0/98]      Time 3.913 (3.913)      Data 3.893 (3.893)      Loss
0.9706 (0.9706)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.350 (3.350)      Loss 1.1694 (1.1694)    Prec 62.891%
(62.891%)
 * Prec 63.490%
best acc: 64.800000
Epoch: [172][0/98]      Time 3.893 (3.893)      Data 3.873 (3.873)      Loss
0.9537 (0.9537)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.391 (3.391)      Loss 1.1815 (1.1815)    Prec 62.695%
(62.695%)
 * Prec 63.470%
best acc: 64.800000
Epoch: [173][0/98]      Time 3.904 (3.904)      Data 3.883 (3.883)      Loss
0.9673 (0.9673)    Prec 68.945% (68.945%)
Validation starts
```

```
Test: [0/20]    Time 3.331 (3.331)      Loss 1.1693 (1.1693)    Prec 65.234%
(65.234%)
 * Prec 64.020%
best acc: 64.800000
Epoch: [174][0/98]      Time 3.914 (3.914)      Data 3.892 (3.892)      Loss
0.9764 (0.9764)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.358 (3.358)      Loss 1.1452 (1.1452)    Prec 64.453%
(64.453%)
 * Prec 64.490%
best acc: 64.800000
Epoch: [175][0/98]      Time 3.929 (3.929)      Data 3.908 (3.908)      Loss
0.9826 (0.9826)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.384 (3.384)      Loss 1.1576 (1.1576)    Prec 63.477%
(63.477%)
 * Prec 63.890%
best acc: 64.800000
Epoch: [176][0/98]      Time 3.888 (3.888)      Data 3.867 (3.867)      Loss
0.9454 (0.9454)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.413 (3.413)      Loss 1.1776 (1.1776)    Prec 63.867%
(63.867%)
 * Prec 64.150%
best acc: 64.800000
Epoch: [177][0/98]      Time 3.922 (3.922)      Data 3.899 (3.899)      Loss
0.9514 (0.9514)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.424 (3.424)      Loss 1.1585 (1.1585)    Prec 64.453%
(64.453%)
 * Prec 64.330%
best acc: 64.800000
Epoch: [178][0/98]      Time 3.917 (3.917)      Data 3.893 (3.893)      Loss
0.9522 (0.9522)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.750 (3.750)      Loss 1.1412 (1.1412)    Prec 66.016%
(66.016%)
 * Prec 64.370%
best acc: 64.800000
Epoch: [179][0/98]      Time 4.276 (4.276)      Data 4.254 (4.254)      Loss
0.9473 (0.9473)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.770 (3.770)      Loss 1.1304 (1.1304)    Prec 65.039%
(65.039%)
 * Prec 64.770%
best acc: 64.800000
Epoch: [180][0/98]      Time 4.370 (4.370)      Data 4.347 (4.347)      Loss
0.9569 (0.9569)    Prec 71.484% (71.484%)
```

```
Validation starts
Test: [0/20]    Time 3.770 (3.770)      Loss 1.1540 (1.1540)    Prec 63.672%
(63.672%)
 * Prec 64.240%
best acc: 64.800000
Epoch: [181][0/98]      Time 4.340 (4.340)      Data 4.318 (4.318)      Loss
1.0111 (1.0111)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.750 (3.750)      Loss 1.1233 (1.1233)    Prec 65.430%
(65.430%)
 * Prec 64.590%
best acc: 64.800000
Epoch: [182][0/98]      Time 4.300 (4.300)      Data 4.279 (4.279)      Loss
0.9610 (0.9610)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.461 (3.461)      Loss 1.1626 (1.1626)    Prec 64.453%
(64.453%)
 * Prec 64.510%
best acc: 64.800000
Epoch: [183][0/98]      Time 4.127 (4.127)      Data 4.105 (4.105)      Loss
0.9910 (0.9910)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.574 (3.574)      Loss 1.1514 (1.1514)    Prec 65.039%
(65.039%)
 * Prec 64.320%
best acc: 64.800000
Epoch: [184][0/98]      Time 4.103 (4.103)      Data 4.082 (4.082)      Loss
0.9921 (0.9921)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.358 (3.358)      Loss 1.1704 (1.1704)    Prec 63.477%
(63.477%)
 * Prec 64.060%
best acc: 64.800000
Epoch: [185][0/98]      Time 3.872 (3.872)      Data 3.849 (3.849)      Loss
0.9561 (0.9561)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.402 (3.402)      Loss 1.1725 (1.1725)    Prec 63.672%
(63.672%)
 * Prec 64.190%
best acc: 64.800000
Epoch: [186][0/98]      Time 3.914 (3.914)      Data 3.892 (3.892)      Loss
0.9727 (0.9727)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.350 (3.350)      Loss 1.1892 (1.1892)    Prec 63.672%
(63.672%)
 * Prec 64.690%
best acc: 64.800000
Epoch: [187][0/98]      Time 3.897 (3.897)      Data 3.875 (3.875)      Loss
```

```
0.9590 (0.9590)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.656 (3.656)      Loss 1.1940 (1.1940)    Prec 61.914%
(61.914%)
 * Prec 64.290%
best acc: 64.800000
Epoch: [188][0/98]      Time 4.104 (4.104)      Data 4.082 (4.082)      Loss
0.9937 (0.9937)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.478 (3.478)      Loss 1.1771 (1.1771)    Prec 63.086%
(63.086%)
 * Prec 64.520%
best acc: 64.800000
Epoch: [189][0/98]      Time 3.940 (3.940)      Data 3.919 (3.919)      Loss
0.9489 (0.9489)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.464 (3.464)      Loss 1.2060 (1.2060)    Prec 64.062%
(64.062%)
 * Prec 63.520%
best acc: 64.800000
Epoch: [190][0/98]      Time 3.917 (3.917)      Data 3.895 (3.895)      Loss
0.9453 (0.9453)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.396 (3.396)      Loss 1.1422 (1.1422)    Prec 64.648%
(64.648%)
 * Prec 64.350%
best acc: 64.800000
Epoch: [191][0/98]      Time 3.991 (3.991)      Data 3.970 (3.970)      Loss
0.9768 (0.9768)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.433 (3.433)      Loss 1.1639 (1.1639)    Prec 64.062%
(64.062%)
 * Prec 64.530%
best acc: 64.800000
Epoch: [192][0/98]      Time 4.000 (4.000)      Data 3.978 (3.978)      Loss
0.9405 (0.9405)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.396 (3.396)      Loss 1.1767 (1.1767)    Prec 63.477%
(63.477%)
 * Prec 64.040%
best acc: 64.800000
Epoch: [193][0/98]      Time 4.272 (4.272)      Data 4.252 (4.252)      Loss
0.9555 (0.9555)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.760 (3.760)      Loss 1.2094 (1.2094)    Prec 61.719%
(61.719%)
 * Prec 63.570%
best acc: 64.800000
```

```
Epoch: [194][0/98]      Time 4.395 (4.395)      Data 4.373 (4.373)      Loss
0.9701 (0.9701)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.721 (3.721)      Loss 1.1858 (1.1858)    Prec 64.062%
(64.062%)
 * Prec 63.920%
best acc: 64.800000
Epoch: [195][0/98]      Time 4.238 (4.238)      Data 4.216 (4.216)      Loss
0.9805 (0.9805)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1853 (1.1853)    Prec 62.891%
(62.891%)
 * Prec 64.180%
best acc: 64.800000
Epoch: [196][0/98]      Time 4.263 (4.263)      Data 4.238 (4.238)      Loss
0.9269 (0.9269)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1645 (1.1645)    Prec 64.062%
(64.062%)
 * Prec 64.210%
best acc: 64.800000
Epoch: [197][0/98]      Time 4.295 (4.295)      Data 4.272 (4.272)      Loss
0.9525 (0.9525)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.987 (3.987)      Loss 1.1546 (1.1546)    Prec 64.062%
(64.062%)
 * Prec 64.400%
best acc: 64.800000
Epoch: [198][0/98]      Time 4.385 (4.385)      Data 4.255 (4.255)      Loss
0.9759 (0.9759)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.633 (3.633)      Loss 1.1771 (1.1771)    Prec 63.477%
(63.477%)
 * Prec 64.200%
best acc: 64.800000
Epoch: [199][0/98]      Time 4.206 (4.206)      Data 4.184 (4.184)      Loss
0.9711 (0.9711)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.665 (3.665)      Loss 1.1941 (1.1941)    Prec 62.891%
(62.891%)
 * Prec 64.180%
best acc: 64.800000
Epoch: [200][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9845 (0.9845)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.2072 (1.2072)    Prec 63.672%
(63.672%)
 * Prec 63.900%
```

```
best acc: 64.800000
Epoch: [201][0/98]      Time 4.195 (4.195)      Data 4.173 (4.173)      Loss
0.9281 (0.9281)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.632 (3.632)      Loss 1.1392 (1.1392)    Prec 65.234%
(65.234%)
 * Prec 64.730%
best acc: 64.800000
Epoch: [202][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9554 (0.9554)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.664 (3.664)      Loss 1.1491 (1.1491)    Prec 64.062%
(64.062%)
 * Prec 63.730%
best acc: 64.800000
Epoch: [203][0/98]      Time 4.191 (4.191)      Data 4.168 (4.168)      Loss
0.9600 (0.9600)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.669 (3.669)      Loss 1.2060 (1.2060)    Prec 62.891%
(62.891%)
 * Prec 64.380%
best acc: 64.800000
Epoch: [204][0/98]      Time 4.237 (4.237)      Data 4.216 (4.216)      Loss
1.0467 (1.0467)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.662 (3.662)      Loss 1.1663 (1.1663)    Prec 63.281%
(63.281%)
 * Prec 63.570%
best acc: 64.800000
Epoch: [205][0/98]      Time 4.179 (4.179)      Data 4.158 (4.158)      Loss
0.9419 (0.9419)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.638 (3.638)      Loss 1.1682 (1.1682)    Prec 63.477%
(63.477%)
 * Prec 63.900%
best acc: 64.800000
Epoch: [206][0/98]      Time 4.369 (4.369)      Data 4.267 (4.267)      Loss
0.9364 (0.9364)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.733 (3.733)      Loss 1.1407 (1.1407)    Prec 64.258%
(64.258%)
 * Prec 63.750%
best acc: 64.800000
Epoch: [207][0/98]      Time 4.207 (4.207)      Data 4.184 (4.184)      Loss
1.0239 (1.0239)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.686 (3.686)      Loss 1.1869 (1.1869)    Prec 62.695%
(62.695%)
```

```
 * Prec 63.900%
best acc: 64.800000
Epoch: [208][0/98]      Time 4.332 (4.332)      Data 4.232 (4.232)      Loss
0.9671 (0.9671)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.659 (3.659)      Loss 1.2051 (1.2051)    Prec 64.844%
(64.844%)
 * Prec 63.850%
best acc: 64.800000
Epoch: [209][0/98]      Time 4.209 (4.209)      Data 4.188 (4.188)      Loss
1.0081 (1.0081)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.716 (3.716)      Loss 1.1655 (1.1655)    Prec 64.648%
(64.648%)
 * Prec 64.170%
best acc: 64.800000
Epoch: [210][0/98]      Time 4.242 (4.242)      Data 4.219 (4.219)      Loss
0.9494 (0.9494)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.603 (3.603)      Loss 1.1497 (1.1497)    Prec 64.258%
(64.258%)
 * Prec 64.390%
best acc: 64.800000
Epoch: [211][0/98]      Time 4.288 (4.288)      Data 4.186 (4.186)      Loss
0.9409 (0.9409)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.647 (3.647)      Loss 1.1494 (1.1494)    Prec 65.234%
(65.234%)
 * Prec 64.150%
best acc: 64.800000
Epoch: [212][0/98]      Time 4.191 (4.191)      Data 4.169 (4.169)      Loss
1.0207 (1.0207)    Prec 65.430% (65.430%)
Validation starts
Test: [0/20]    Time 3.625 (3.625)      Loss 1.1579 (1.1579)    Prec 63.672%
(63.672%)
 * Prec 64.480%
best acc: 64.800000
Epoch: [213][0/98]      Time 4.193 (4.193)      Data 4.170 (4.170)      Loss
0.9410 (0.9410)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1497 (1.1497)    Prec 64.062%
(64.062%)
 * Prec 63.690%
best acc: 64.800000
Epoch: [214][0/98]      Time 4.236 (4.236)      Data 4.165 (4.165)      Loss
0.9419 (0.9419)    Prec 74.609% (74.609%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1804 (1.1804)    Prec 62.891%
```

```
(62.891%)
 * Prec 64.150%
best acc: 64.800000
Epoch: [215][0/98]      Time 4.208 (4.208)      Data 4.186 (4.186)      Loss
0.9221 (0.9221)    Prec 73.828% (73.828%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.1957 (1.1957)    Prec 65.039%
(65.039%)
 * Prec 64.610%
best acc: 64.800000
Epoch: [216][0/98]      Time 4.259 (4.259)      Data 4.237 (4.237)      Loss
0.9766 (0.9766)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.764 (3.764)      Loss 1.1536 (1.1536)    Prec 63.867%
(63.867%)
 * Prec 64.450%
best acc: 64.800000
Epoch: [217][0/98]      Time 4.240 (4.240)      Data 4.219 (4.219)      Loss
0.9994 (0.9994)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.642 (3.642)      Loss 1.1571 (1.1571)    Prec 63.477%
(63.477%)
 * Prec 63.620%
best acc: 64.800000
Epoch: [218][0/98]      Time 4.223 (4.223)      Data 4.200 (4.200)      Loss
0.9906 (0.9906)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1679 (1.1679)    Prec 63.086%
(63.086%)
 * Prec 63.740%
best acc: 64.800000
Epoch: [219][0/98]      Time 4.349 (4.349)      Data 4.248 (4.248)      Loss
0.9274 (0.9274)    Prec 73.047% (73.047%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1165 (1.1165)    Prec 65.039%
(65.039%)
 * Prec 64.210%
best acc: 64.800000
Epoch: [220][0/98]      Time 4.233 (4.233)      Data 4.211 (4.211)      Loss
1.0055 (1.0055)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.675 (3.675)      Loss 1.1443 (1.1443)    Prec 64.258%
(64.258%)
 * Prec 64.550%
best acc: 64.800000
Epoch: [221][0/98]      Time 4.306 (4.306)      Data 4.284 (4.284)      Loss
0.9322 (0.9322)    Prec 70.117% (70.117%)
Validation starts
```

```
Test: [0/20]    Time 3.736 (3.736)      Loss 1.1544 (1.1544)    Prec 65.430%
(65.430%)
 * Prec 63.670%
best acc: 64.800000
Epoch: [222][0/98]      Time 4.203 (4.203)      Data 4.179 (4.179)      Loss
0.9745 (0.9745)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1543 (1.1543)    Prec 64.062%
(64.062%)
 * Prec 64.310%
best acc: 64.800000
Epoch: [223][0/98]      Time 4.228 (4.228)      Data 4.206 (4.206)      Loss
0.9503 (0.9503)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.625 (3.625)      Loss 1.1496 (1.1496)    Prec 64.453%
(64.453%)
 * Prec 63.670%
best acc: 64.800000
Epoch: [224][0/98]      Time 4.222 (4.222)      Data 4.201 (4.201)      Loss
0.9901 (0.9901)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1464 (1.1464)    Prec 63.867%
(63.867%)
 * Prec 63.810%
best acc: 64.800000
Epoch: [225][0/98]      Time 4.290 (4.290)      Data 4.188 (4.188)      Loss
1.0270 (1.0270)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.603 (3.603)      Loss 1.1501 (1.1501)    Prec 64.648%
(64.648%)
 * Prec 64.330%
best acc: 64.800000
Epoch: [226][0/98]      Time 4.304 (4.304)      Data 4.199 (4.199)      Loss
0.9787 (0.9787)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.651 (3.651)      Loss 1.1620 (1.1620)    Prec 64.062%
(64.062%)
 * Prec 63.530%
best acc: 64.800000
Epoch: [227][0/98]      Time 4.205 (4.205)      Data 4.182 (4.182)      Loss
0.9738 (0.9738)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.664 (3.664)      Loss 1.2166 (1.2166)    Prec 61.719%
(61.719%)
 * Prec 63.590%
best acc: 64.800000
Epoch: [228][0/98]      Time 4.325 (4.325)      Data 4.221 (4.221)      Loss
1.0039 (1.0039)    Prec 67.383% (67.383%)
```

```
Validation starts
Test: [0/20]    Time 3.793 (3.793)      Loss 1.1625 (1.1625)    Prec 64.062%
(64.062%)
 * Prec 64.250%
best acc: 64.800000
Epoch: [229][0/98]      Time 4.292 (4.292)      Data 4.268 (4.268)      Loss
0.9644 (0.9644)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.696 (3.696)      Loss 1.1773 (1.1773)    Prec 64.453%
(64.453%)
 * Prec 63.760%
best acc: 64.800000
Epoch: [230][0/98]      Time 4.217 (4.217)      Data 4.193 (4.193)      Loss
0.9714 (0.9714)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.715 (3.715)      Loss 1.1572 (1.1572)    Prec 65.430%
(65.430%)
 * Prec 63.760%
best acc: 64.800000
Epoch: [231][0/98]      Time 4.190 (4.190)      Data 4.169 (4.169)      Loss
1.0175 (1.0175)    Prec 65.234% (65.234%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1609 (1.1609)    Prec 63.086%
(63.086%)
 * Prec 63.610%
best acc: 64.800000
Epoch: [232][0/98]      Time 4.187 (4.187)      Data 4.164 (4.164)      Loss
1.0180 (1.0180)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.2136 (1.2136)    Prec 63.086%
(63.086%)
 * Prec 63.960%
best acc: 64.800000
Epoch: [233][0/98]      Time 4.253 (4.253)      Data 4.149 (4.149)      Loss
0.9757 (0.9757)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.740 (3.740)      Loss 1.1442 (1.1442)    Prec 64.648%
(64.648%)
 * Prec 64.410%
best acc: 64.800000
Epoch: [234][0/98]      Time 4.207 (4.207)      Data 4.185 (4.185)      Loss
0.9868 (0.9868)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1926 (1.1926)    Prec 64.062%
(64.062%)
 * Prec 64.920%
best acc: 64.920000
Epoch: [235][0/98]      Time 4.280 (4.280)      Data 4.179 (4.179)      Loss
```

```
0.9913 (0.9913)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.735 (3.735)      Loss 1.1416 (1.1416)    Prec 64.648%
(64.648%)
 * Prec 64.580%
best acc: 64.920000
Epoch: [236][0/98]      Time 4.194 (4.194)      Data 4.173 (4.173)      Loss
0.9567 (0.9567)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1891 (1.1891)    Prec 62.695%
(62.695%)
 * Prec 63.650%
best acc: 64.920000
Epoch: [237][0/98]      Time 4.206 (4.206)      Data 4.182 (4.182)      Loss
0.9943 (0.9943)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.650 (3.650)      Loss 1.1204 (1.1204)    Prec 64.258%
(64.258%)
 * Prec 63.860%
best acc: 64.920000
Epoch: [238][0/98]      Time 4.198 (4.198)      Data 4.175 (4.175)      Loss
0.9595 (0.9595)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.636 (3.636)      Loss 1.1521 (1.1521)    Prec 62.891%
(62.891%)
 * Prec 63.740%
best acc: 64.920000
Epoch: [239][0/98]      Time 4.251 (4.251)      Data 4.148 (4.148)      Loss
0.9783 (0.9783)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.592 (3.592)      Loss 1.1795 (1.1795)    Prec 63.086%
(63.086%)
 * Prec 63.680%
best acc: 64.920000
Epoch: [240][0/98]      Time 4.247 (4.247)      Data 4.226 (4.226)      Loss
0.9593 (0.9593)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1789 (1.1789)    Prec 63.672%
(63.672%)
 * Prec 64.520%
best acc: 64.920000
Epoch: [241][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9853 (0.9853)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.639 (3.639)      Loss 1.1518 (1.1518)    Prec 65.039%
(65.039%)
 * Prec 64.640%
best acc: 64.920000
```

```
Epoch: [242][0/98]      Time 4.229 (4.229)      Data 4.205 (4.205)      Loss
0.9466 (0.9466)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.631 (3.631)      Loss 1.1608 (1.1608)    Prec 64.844%
(64.844%)
 * Prec 64.070%
best acc: 64.920000
Epoch: [243][0/98]      Time 4.273 (4.273)      Data 4.171 (4.171)      Loss
0.9633 (0.9633)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.714 (3.714)      Loss 1.1560 (1.1560)    Prec 63.672%
(63.672%)
 * Prec 63.440%
best acc: 64.920000
Epoch: [244][0/98]      Time 4.212 (4.212)      Data 4.187 (4.187)      Loss
0.9645 (0.9645)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.613 (3.613)      Loss 1.1692 (1.1692)    Prec 63.867%
(63.867%)
 * Prec 64.270%
best acc: 64.920000
Epoch: [245][0/98]      Time 4.234 (4.234)      Data 4.210 (4.210)      Loss
0.9861 (0.9861)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.1752 (1.1752)    Prec 65.430%
(65.430%)
 * Prec 63.910%
best acc: 64.920000
Epoch: [246][0/98]      Time 4.270 (4.270)      Data 4.169 (4.169)      Loss
0.9763 (0.9763)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1462 (1.1462)    Prec 64.258%
(64.258%)
 * Prec 64.460%
best acc: 64.920000
Epoch: [247][0/98]      Time 4.221 (4.221)      Data 4.200 (4.200)      Loss
0.9664 (0.9664)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1645 (1.1645)    Prec 63.477%
(63.477%)
 * Prec 64.120%
best acc: 64.920000
Epoch: [248][0/98]      Time 4.251 (4.251)      Data 4.148 (4.148)      Loss
0.9460 (0.9460)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.648 (3.648)      Loss 1.1780 (1.1780)    Prec 62.500%
(62.500%)
 * Prec 64.070%
```

```
best acc: 64.920000
Epoch: [249][0/98]      Time 4.255 (4.255)      Data 4.234 (4.234)      Loss
0.9589 (0.9589)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1966 (1.1966)    Prec 62.695%
(62.695%)
 * Prec 63.140%
best acc: 64.920000
Epoch: [250][0/98]      Time 4.189 (4.189)      Data 4.167 (4.167)      Loss
0.9072 (0.9072)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.641 (3.641)      Loss 1.1508 (1.1508)    Prec 63.477%
(63.477%)
 * Prec 64.450%
best acc: 64.920000
Epoch: [251][0/98]      Time 4.324 (4.324)      Data 4.221 (4.221)      Loss
0.9482 (0.9482)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.712 (3.712)      Loss 1.1579 (1.1579)    Prec 63.281%
(63.281%)
 * Prec 63.790%
best acc: 64.920000
Epoch: [252][0/98]      Time 4.167 (4.167)      Data 4.144 (4.144)      Loss
0.9494 (0.9494)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1275 (1.1275)    Prec 64.062%
(64.062%)
 * Prec 63.700%
best acc: 64.920000
Epoch: [253][0/98]      Time 4.174 (4.174)      Data 4.148 (4.148)      Loss
1.0026 (1.0026)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.592 (3.592)      Loss 1.1767 (1.1767)    Prec 63.281%
(63.281%)
 * Prec 63.920%
best acc: 64.920000
Epoch: [254][0/98]      Time 4.163 (4.163)      Data 4.141 (4.141)      Loss
0.9604 (0.9604)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1705 (1.1705)    Prec 64.453%
(64.453%)
 * Prec 64.550%
best acc: 64.920000
Epoch: [255][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9690 (0.9690)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.669 (3.669)      Loss 1.1735 (1.1735)    Prec 63.281%
(63.281%)
```

```
 * Prec 64.420%
best acc: 64.920000
Epoch: [256][0/98]      Time 4.176 (4.176)      Data 4.154 (4.154)      Loss
0.9238 (0.9238)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.622 (3.622)      Loss 1.1861 (1.1861)    Prec 61.914%
(61.914%)
 * Prec 63.770%
best acc: 64.920000
Epoch: [257][0/98]      Time 4.200 (4.200)      Data 4.178 (4.178)      Loss
0.9511 (0.9511)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1287 (1.1287)    Prec 66.016%
(66.016%)
 * Prec 64.610%
best acc: 64.920000
Epoch: [258][0/98]      Time 4.185 (4.185)      Data 4.163 (4.163)      Loss
0.9731 (0.9731)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.584 (3.584)      Loss 1.1715 (1.1715)    Prec 64.062%
(64.062%)
 * Prec 64.410%
best acc: 64.920000
Epoch: [259][0/98]      Time 4.175 (4.175)      Data 4.151 (4.151)      Loss
0.9377 (0.9377)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.637 (3.637)      Loss 1.1712 (1.1712)    Prec 64.453%
(64.453%)
 * Prec 64.530%
best acc: 64.920000
Epoch: [260][0/98]      Time 4.181 (4.181)      Data 4.151 (4.151)      Loss
0.9224 (0.9224)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.663 (3.663)      Loss 1.1639 (1.1639)    Prec 64.453%
(64.453%)
 * Prec 64.630%
best acc: 64.920000
Epoch: [261][0/98]      Time 4.196 (4.196)      Data 4.175 (4.175)      Loss
0.9681 (0.9681)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1529 (1.1529)    Prec 63.477%
(63.477%)
 * Prec 63.360%
best acc: 64.920000
Epoch: [262][0/98]      Time 4.231 (4.231)      Data 4.210 (4.210)      Loss
0.9671 (0.9671)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.625 (3.625)      Loss 1.1774 (1.1774)    Prec 64.062%
```

```
(64.062%)
 * Prec 64.460%
best acc: 64.920000
Epoch: [263][0/98]      Time 4.172 (4.172)      Data 4.149 (4.149)      Loss
0.9541 (0.9541)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.587 (3.587)      Loss 1.1469 (1.1469)    Prec 64.648%
(64.648%)
 * Prec 64.460%
best acc: 64.920000
Epoch: [264][0/98]      Time 4.179 (4.179)      Data 4.158 (4.158)      Loss
0.9369 (0.9369)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1601 (1.1601)    Prec 64.258%
(64.258%)
 * Prec 64.890%
best acc: 64.920000
Epoch: [265][0/98]      Time 4.174 (4.174)      Data 4.153 (4.153)      Loss
0.9668 (0.9668)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.2173 (1.2173)    Prec 63.477%
(63.477%)
 * Prec 64.330%
best acc: 64.920000
Epoch: [266][0/98]      Time 4.209 (4.209)      Data 4.188 (4.188)      Loss
0.9921 (0.9921)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.575 (3.575)      Loss 1.1887 (1.1887)    Prec 63.672%
(63.672%)
 * Prec 64.630%
best acc: 64.920000
Epoch: [267][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9593 (0.9593)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1554 (1.1554)    Prec 64.844%
(64.844%)
 * Prec 64.590%
best acc: 64.920000
Epoch: [268][0/98]      Time 4.169 (4.169)      Data 4.147 (4.147)      Loss
0.9575 (0.9575)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.587 (3.587)      Loss 1.1667 (1.1667)    Prec 62.695%
(62.695%)
 * Prec 63.870%
best acc: 64.920000
Epoch: [269][0/98]      Time 4.178 (4.178)      Data 4.156 (4.156)      Loss
0.9485 (0.9485)    Prec 68.750% (68.750%)
Validation starts
```

```
Test: [0/20]    Time 3.592 (3.592)      Loss 1.1717 (1.1717)    Prec 63.086%
(63.086%)
 * Prec 64.750%
best acc: 64.920000
Epoch: [270][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9623 (0.9623)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.593 (3.593)      Loss 1.1669 (1.1669)    Prec 62.891%
(62.891%)
 * Prec 63.790%
best acc: 64.920000
Epoch: [271][0/98]      Time 4.166 (4.166)      Data 4.141 (4.141)      Loss
0.9417 (0.9417)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.671 (3.671)      Loss 1.1845 (1.1845)    Prec 64.062%
(64.062%)
 * Prec 63.810%
best acc: 64.920000
Epoch: [272][0/98]      Time 4.156 (4.156)      Data 4.134 (4.134)      Loss
0.9524 (0.9524)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1703 (1.1703)    Prec 64.648%
(64.648%)
 * Prec 64.180%
best acc: 64.920000
Epoch: [273][0/98]      Time 4.170 (4.170)      Data 4.147 (4.147)      Loss
0.9588 (0.9588)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.604 (3.604)      Loss 1.1732 (1.1732)    Prec 62.891%
(62.891%)
 * Prec 63.560%
best acc: 64.920000
Epoch: [274][0/98]      Time 4.202 (4.202)      Data 4.180 (4.180)      Loss
0.9751 (0.9751)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.669 (3.669)      Loss 1.1723 (1.1723)    Prec 63.477%
(63.477%)
 * Prec 64.300%
best acc: 64.920000
Epoch: [275][0/98]      Time 4.184 (4.184)      Data 4.162 (4.162)      Loss
0.9918 (0.9918)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.677 (3.677)      Loss 1.1462 (1.1462)    Prec 64.844%
(64.844%)
 * Prec 64.860%
best acc: 64.920000
Epoch: [276][0/98]      Time 4.296 (4.296)      Data 4.194 (4.194)      Loss
0.9847 (0.9847)    Prec 69.922% (69.922%)
```

```
Validation starts
Test: [0/20]    Time 3.700 (3.700)      Loss 1.1777 (1.1777)    Prec 62.109%
(62.109%)
 * Prec 63.690%
best acc: 64.920000
Epoch: [277][0/98]      Time 4.157 (4.157)      Data 4.135 (4.135)      Loss
0.9500 (0.9500)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.604 (3.604)      Loss 1.1477 (1.1477)    Prec 66.406%
(66.406%)
 * Prec 63.710%
best acc: 64.920000
Epoch: [278][0/98]      Time 4.184 (4.184)      Data 4.160 (4.160)      Loss
0.9487 (0.9487)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.745 (3.745)      Loss 1.1550 (1.1550)    Prec 63.477%
(63.477%)
 * Prec 63.470%
best acc: 64.920000
Epoch: [279][0/98]      Time 4.203 (4.203)      Data 4.181 (4.181)      Loss
1.0098 (1.0098)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.569 (3.569)      Loss 1.1312 (1.1312)    Prec 63.867%
(63.867%)
 * Prec 63.910%
best acc: 64.920000
Epoch: [280][0/98]      Time 4.174 (4.174)      Data 4.152 (4.152)      Loss
0.9472 (0.9472)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.703 (3.703)      Loss 1.1724 (1.1724)    Prec 63.086%
(63.086%)
 * Prec 63.910%
best acc: 64.920000
Epoch: [281][0/98]      Time 4.292 (4.292)      Data 4.270 (4.270)      Loss
0.9613 (0.9613)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1335 (1.1335)    Prec 64.453%
(64.453%)
 * Prec 64.730%
best acc: 64.920000
Epoch: [282][0/98]      Time 4.210 (4.210)      Data 4.187 (4.187)      Loss
1.0116 (1.0116)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.603 (3.603)      Loss 1.1468 (1.1468)    Prec 65.234%
(65.234%)
 * Prec 63.820%
best acc: 64.920000
Epoch: [283][0/98]      Time 4.217 (4.217)      Data 4.195 (4.195)      Loss
```

```
0.9597 (0.9597)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1407 (1.1407)    Prec 64.844%
(64.844%)
 * Prec 65.020%
best acc: 65.020000
Epoch: [284][0/98]      Time 4.170 (4.170)      Data 4.148 (4.148)      Loss
0.9965 (0.9965)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.602 (3.602)      Loss 1.1570 (1.1570)    Prec 64.453%
(64.453%)
 * Prec 64.460%
best acc: 65.020000
Epoch: [285][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9813 (0.9813)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.626 (3.626)      Loss 1.1782 (1.1782)    Prec 65.625%
(65.625%)
 * Prec 64.180%
best acc: 65.020000
Epoch: [286][0/98]      Time 4.210 (4.210)      Data 4.188 (4.188)      Loss
0.9376 (0.9376)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.647 (3.647)      Loss 1.1497 (1.1497)    Prec 63.672%
(63.672%)
 * Prec 64.190%
best acc: 65.020000
Epoch: [287][0/98]      Time 4.180 (4.180)      Data 4.158 (4.158)      Loss
0.9573 (0.9573)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.643 (3.643)      Loss 1.1494 (1.1494)    Prec 64.648%
(64.648%)
 * Prec 64.700%
best acc: 65.020000
Epoch: [288][0/98]      Time 4.260 (4.260)      Data 4.156 (4.156)      Loss
0.9645 (0.9645)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.2001 (1.2001)    Prec 62.891%
(62.891%)
 * Prec 63.620%
best acc: 65.020000
Epoch: [289][0/98]      Time 4.219 (4.219)      Data 4.195 (4.195)      Loss
0.9689 (0.9689)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1567 (1.1567)    Prec 66.211%
(66.211%)
 * Prec 64.500%
best acc: 65.020000
```

```
Epoch: [290][0/98]      Time 4.177 (4.177)      Data 4.155 (4.155)      Loss
0.9547 (0.9547)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1918 (1.1918)    Prec 64.844%
(64.844%)
 * Prec 64.130%
best acc: 65.020000
Epoch: [291][0/98]      Time 4.216 (4.216)      Data 4.195 (4.195)      Loss
0.9488 (0.9488)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.658 (3.658)      Loss 1.1815 (1.1815)    Prec 62.500%
(62.500%)
 * Prec 63.680%
best acc: 65.020000
Epoch: [292][0/98]      Time 4.166 (4.166)      Data 4.143 (4.143)      Loss
0.9558 (0.9558)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.693 (3.693)      Loss 1.1495 (1.1495)    Prec 64.453%
(64.453%)
 * Prec 64.560%
best acc: 65.020000
Epoch: [293][0/98]      Time 4.200 (4.200)      Data 4.177 (4.177)      Loss
0.9822 (0.9822)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.679 (3.679)      Loss 1.1798 (1.1798)    Prec 63.477%
(63.477%)
 * Prec 64.020%
best acc: 65.020000
Epoch: [294][0/98]      Time 4.154 (4.154)      Data 4.130 (4.130)      Loss
0.9409 (0.9409)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1805 (1.1805)    Prec 64.648%
(64.648%)
 * Prec 64.040%
best acc: 65.020000
Epoch: [295][0/98]      Time 4.202 (4.202)      Data 4.180 (4.180)      Loss
0.9548 (0.9548)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.589 (3.589)      Loss 1.1568 (1.1568)    Prec 66.016%
(66.016%)
 * Prec 64.380%
best acc: 65.020000
Epoch: [296][0/98]      Time 4.233 (4.233)      Data 4.210 (4.210)      Loss
0.9290 (0.9290)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.577 (3.577)      Loss 1.1251 (1.1251)    Prec 65.430%
(65.430%)
 * Prec 64.490%
```

```
best acc: 65.020000
Epoch: [297][0/98]      Time 4.132 (4.132)      Data 4.110 (4.110)      Loss
0.9290 (0.9290)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1538 (1.1538)    Prec 63.867%
(63.867%)
 * Prec 64.880%
best acc: 65.020000
Epoch: [298][0/98]      Time 4.198 (4.198)      Data 4.175 (4.175)      Loss
0.9635 (0.9635)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.675 (3.675)      Loss 1.1336 (1.1336)    Prec 65.625%
(65.625%)
 * Prec 65.050%
best acc: 65.050000
Epoch: [299][0/98]      Time 4.182 (4.182)      Data 4.159 (4.159)      Loss
0.9561 (0.9561)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.1698 (1.1698)    Prec 63.672%
(63.672%)
 * Prec 64.690%
best acc: 65.050000
Epoch: [300][0/98]      Time 4.177 (4.177)      Data 4.156 (4.156)      Loss
0.9935 (0.9935)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.651 (3.651)      Loss 1.1533 (1.1533)    Prec 63.867%
(63.867%)
 * Prec 63.870%
best acc: 65.050000
Epoch: [301][0/98]      Time 4.193 (4.193)      Data 4.172 (4.172)      Loss
0.9623 (0.9623)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.613 (3.613)      Loss 1.1596 (1.1596)    Prec 65.039%
(65.039%)
 * Prec 63.980%
best acc: 65.050000
Epoch: [302][0/98]      Time 4.132 (4.132)      Data 4.111 (4.111)      Loss
0.9627 (0.9627)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.616 (3.616)      Loss 1.1597 (1.1597)    Prec 65.625%
(65.625%)
 * Prec 64.710%
best acc: 65.050000
Epoch: [303][0/98]      Time 4.198 (4.198)      Data 4.177 (4.177)      Loss
0.9420 (0.9420)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.660 (3.660)      Loss 1.1391 (1.1391)    Prec 65.234%
(65.234%)
```

```
 * Prec 64.570%
best acc: 65.050000
Epoch: [304][0/98]      Time 4.129 (4.129)      Data 4.105 (4.105)      Loss
0.9697 (0.9697)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.654 (3.654)      Loss 1.1372 (1.1372)    Prec 66.602%
(66.602%)
 * Prec 64.600%
best acc: 65.050000
Epoch: [305][0/98]      Time 4.212 (4.212)      Data 4.190 (4.190)      Loss
0.9798 (0.9798)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1460 (1.1460)    Prec 64.844%
(64.844%)
 * Prec 64.560%
best acc: 65.050000
Epoch: [306][0/98]      Time 4.288 (4.288)      Data 4.185 (4.185)      Loss
0.9517 (0.9517)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.726 (3.726)      Loss 1.1504 (1.1504)    Prec 64.648%
(64.648%)
 * Prec 64.590%
best acc: 65.050000
Epoch: [307][0/98]      Time 4.165 (4.165)      Data 4.144 (4.144)      Loss
1.0019 (1.0019)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.632 (3.632)      Loss 1.1875 (1.1875)    Prec 63.477%
(63.477%)
 * Prec 64.310%
best acc: 65.050000
Epoch: [308][0/98]      Time 4.234 (4.234)      Data 4.212 (4.212)      Loss
0.9833 (0.9833)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.673 (3.673)      Loss 1.1652 (1.1652)    Prec 63.672%
(63.672%)
 * Prec 64.440%
best acc: 65.050000
Epoch: [309][0/98]      Time 4.153 (4.153)      Data 4.131 (4.131)      Loss
0.9723 (0.9723)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.565 (3.565)      Loss 1.1782 (1.1782)    Prec 63.086%
(63.086%)
 * Prec 63.600%
best acc: 65.050000
Epoch: [310][0/98]      Time 4.133 (4.133)      Data 4.112 (4.112)      Loss
0.9262 (0.9262)    Prec 73.828% (73.828%)
Validation starts
Test: [0/20]    Time 3.553 (3.553)      Loss 1.1462 (1.1462)    Prec 66.211%
```

```
(66.211%)
 * Prec 64.300%
best acc: 65.050000
Epoch: [311][0/98]      Time 4.161 (4.161)      Data 4.140 (4.140)      Loss
0.9525 (0.9525)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.594 (3.594)      Loss 1.1371 (1.1371)    Prec 65.430%
(65.430%)
 * Prec 64.550%
best acc: 65.050000
Epoch: [312][0/98]      Time 4.159 (4.159)      Data 4.138 (4.138)      Loss
0.9454 (0.9454)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.668 (3.668)      Loss 1.1643 (1.1643)    Prec 65.039%
(65.039%)
 * Prec 64.700%
best acc: 65.050000
Epoch: [313][0/98]      Time 4.184 (4.184)      Data 4.162 (4.162)      Loss
0.9834 (0.9834)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.557 (3.557)      Loss 1.1527 (1.1527)    Prec 63.867%
(63.867%)
 * Prec 64.460%
best acc: 65.050000
Epoch: [314][0/98]      Time 4.116 (4.116)      Data 4.092 (4.092)      Loss
0.9512 (0.9512)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.687 (3.687)      Loss 1.1446 (1.1446)    Prec 64.062%
(64.062%)
 * Prec 63.880%
best acc: 65.050000
Epoch: [315][0/98]      Time 4.187 (4.187)      Data 4.166 (4.166)      Loss
0.9967 (0.9967)    Prec 65.039% (65.039%)
Validation starts
Test: [0/20]    Time 3.561 (3.561)      Loss 1.1636 (1.1636)    Prec 64.062%
(64.062%)
 * Prec 63.730%
best acc: 65.050000
Epoch: [316][0/98]      Time 4.175 (4.175)      Data 4.152 (4.152)      Loss
0.9610 (0.9610)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.695 (3.695)      Loss 1.1390 (1.1390)    Prec 64.844%
(64.844%)
 * Prec 63.670%
best acc: 65.050000
Epoch: [317][0/98]      Time 4.176 (4.176)      Data 4.154 (4.154)      Loss
0.9338 (0.9338)    Prec 72.461% (72.461%)
Validation starts
```

```
Test: [0/20]    Time 3.590 (3.590)      Loss 1.1787 (1.1787)    Prec 63.477%
(63.477%)
 * Prec 64.060%
best acc: 65.050000
Epoch: [318][0/98]      Time 4.201 (4.201)      Data 4.178 (4.178)      Loss
0.9717 (0.9717)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.643 (3.643)      Loss 1.1261 (1.1261)    Prec 64.648%
(64.648%)
 * Prec 64.010%
best acc: 65.050000
Epoch: [319][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9687 (0.9687)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.587 (3.587)      Loss 1.1371 (1.1371)    Prec 65.234%
(65.234%)
 * Prec 64.900%
best acc: 65.050000
Epoch: [320][0/98]      Time 4.201 (4.201)      Data 4.176 (4.176)      Loss
0.9553 (0.9553)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.708 (3.708)      Loss 1.1733 (1.1733)    Prec 64.258%
(64.258%)
 * Prec 64.330%
best acc: 65.050000
Epoch: [321][0/98]      Time 4.168 (4.168)      Data 4.146 (4.146)      Loss
0.9674 (0.9674)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.617 (3.617)      Loss 1.1762 (1.1762)    Prec 63.867%
(63.867%)
 * Prec 64.480%
best acc: 65.050000
Epoch: [322][0/98]      Time 4.183 (4.183)      Data 4.159 (4.159)      Loss
0.9600 (0.9600)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1542 (1.1542)    Prec 64.844%
(64.844%)
 * Prec 64.160%
best acc: 65.050000
Epoch: [323][0/98]      Time 4.181 (4.181)      Data 4.159 (4.159)      Loss
0.9498 (0.9498)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.642 (3.642)      Loss 1.1502 (1.1502)    Prec 66.016%
(66.016%)
 * Prec 64.570%
best acc: 65.050000
Epoch: [324][0/98]      Time 4.186 (4.186)      Data 4.163 (4.163)      Loss
0.9435 (0.9435)    Prec 71.484% (71.484%)
```

```
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1651 (1.1651)    Prec 64.258%
(64.258%)
 * Prec 64.580%
best acc: 65.050000
Epoch: [325][0/98]      Time 4.264 (4.264)      Data 4.161 (4.161)      Loss
0.9653 (0.9653)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.612 (3.612)      Loss 1.1451 (1.1451)    Prec 64.453%
(64.453%)
 * Prec 64.000%
best acc: 65.050000
Epoch: [326][0/98]      Time 4.202 (4.202)      Data 4.177 (4.177)      Loss
0.9613 (0.9613)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1478 (1.1478)    Prec 64.453%
(64.453%)
 * Prec 64.650%
best acc: 65.050000
Epoch: [327][0/98]      Time 4.180 (4.180)      Data 4.157 (4.157)      Loss
0.9607 (0.9607)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.659 (3.659)      Loss 1.1651 (1.1651)    Prec 64.062%
(64.062%)
 * Prec 63.970%
best acc: 65.050000
Epoch: [328][0/98]      Time 4.201 (4.201)      Data 4.178 (4.178)      Loss
0.9776 (0.9776)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1769 (1.1769)    Prec 64.258%
(64.258%)
 * Prec 64.040%
best acc: 65.050000
Epoch: [329][0/98]      Time 4.189 (4.189)      Data 4.167 (4.167)      Loss
0.9725 (0.9725)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1687 (1.1687)    Prec 64.258%
(64.258%)
 * Prec 64.470%
best acc: 65.050000
Epoch: [330][0/98]      Time 4.162 (4.162)      Data 4.140 (4.140)      Loss
0.9416 (0.9416)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.656 (3.656)      Loss 1.1793 (1.1793)    Prec 62.305%
(62.305%)
 * Prec 63.590%
best acc: 65.050000
Epoch: [331][0/98]      Time 4.152 (4.152)      Data 4.130 (4.130)      Loss
```

```
0.9651 (0.9651)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.632 (3.632)      Loss 1.1525 (1.1525)    Prec 64.453%
(64.453%)
 * Prec 64.320%
best acc: 65.050000
Epoch: [332][0/98]      Time 4.277 (4.277)      Data 4.171 (4.171)      Loss
0.9417 (0.9417)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.586 (3.586)      Loss 1.1645 (1.1645)    Prec 64.258%
(64.258%)
 * Prec 64.700%
best acc: 65.050000
Epoch: [333][0/98]      Time 4.325 (4.325)      Data 4.222 (4.222)      Loss
0.9592 (0.9592)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1671 (1.1671)    Prec 63.867%
(63.867%)
 * Prec 64.670%
best acc: 65.050000
Epoch: [334][0/98]      Time 4.154 (4.154)      Data 4.130 (4.130)      Loss
0.9908 (0.9908)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.685 (3.685)      Loss 1.1572 (1.1572)    Prec 64.648%
(64.648%)
 * Prec 64.390%
best acc: 65.050000
Epoch: [335][0/98]      Time 4.179 (4.179)      Data 4.156 (4.156)      Loss
0.9324 (0.9324)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1710 (1.1710)    Prec 65.430%
(65.430%)
 * Prec 64.230%
best acc: 65.050000
Epoch: [336][0/98]      Time 4.169 (4.169)      Data 4.147 (4.147)      Loss
0.9332 (0.9332)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.534 (3.534)      Loss 1.1327 (1.1327)    Prec 64.648%
(64.648%)
 * Prec 64.740%
best acc: 65.050000
Epoch: [337][0/98]      Time 4.203 (4.203)      Data 4.181 (4.181)      Loss
0.9790 (0.9790)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.628 (3.628)      Loss 1.1881 (1.1881)    Prec 62.500%
(62.500%)
 * Prec 63.640%
best acc: 65.050000
```

```
Epoch: [338][0/98]      Time 4.171 (4.171)      Data 4.148 (4.148)      Loss
0.9841 (0.9841)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.615 (3.615)      Loss 1.1651 (1.1651)    Prec 63.867%
(63.867%)
 * Prec 64.320%
best acc: 65.050000
Epoch: [339][0/98]      Time 4.172 (4.172)      Data 4.150 (4.150)      Loss
0.9948 (0.9948)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.585 (3.585)      Loss 1.1452 (1.1452)    Prec 65.039%
(65.039%)
 * Prec 64.180%
best acc: 65.050000
Epoch: [340][0/98]      Time 4.192 (4.192)      Data 4.170 (4.170)      Loss
0.8998 (0.8998)    Prec 75.391% (75.391%)
Validation starts
Test: [0/20]    Time 3.593 (3.593)      Loss 1.1765 (1.1765)    Prec 63.867%
(63.867%)
 * Prec 64.820%
best acc: 65.050000
Epoch: [341][0/98]      Time 4.151 (4.151)      Data 4.128 (4.128)      Loss
0.9737 (0.9737)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1571 (1.1571)    Prec 64.844%
(64.844%)
 * Prec 64.640%
best acc: 65.050000
Epoch: [342][0/98]      Time 4.278 (4.278)      Data 4.178 (4.178)      Loss
1.0359 (1.0359)    Prec 63.672% (63.672%)
Validation starts
Test: [0/20]    Time 3.615 (3.615)      Loss 1.1794 (1.1794)    Prec 63.672%
(63.672%)
 * Prec 64.480%
best acc: 65.050000
Epoch: [343][0/98]      Time 4.253 (4.253)      Data 4.149 (4.149)      Loss
0.9532 (0.9532)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.616 (3.616)      Loss 1.1652 (1.1652)    Prec 64.062%
(64.062%)
 * Prec 64.540%
best acc: 65.050000
Epoch: [344][0/98]      Time 4.160 (4.160)      Data 4.136 (4.136)      Loss
0.9578 (0.9578)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1831 (1.1831)    Prec 65.039%
(65.039%)
 * Prec 64.050%
```

```
best acc: 65.050000
Epoch: [345][0/98]      Time 4.158 (4.158)      Data 4.134 (4.134)      Loss
0.9623 (0.9623)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.704 (3.704)      Loss 1.1693 (1.1693)    Prec 64.258%
(64.258%)
 * Prec 64.500%
best acc: 65.050000
Epoch: [346][0/98]      Time 4.198 (4.198)      Data 4.176 (4.176)      Loss
0.9431 (0.9431)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.559 (3.559)      Loss 1.1341 (1.1341)    Prec 66.016%
(66.016%)
 * Prec 64.260%
best acc: 65.050000
Epoch: [347][0/98]      Time 4.244 (4.244)      Data 4.222 (4.222)      Loss
0.9833 (0.9833)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.612 (3.612)      Loss 1.1835 (1.1835)    Prec 64.844%
(64.844%)
 * Prec 63.700%
best acc: 65.050000
Epoch: [348][0/98]      Time 4.193 (4.193)      Data 4.171 (4.171)      Loss
0.9571 (0.9571)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.703 (3.703)      Loss 1.1676 (1.1676)    Prec 65.430%
(65.430%)
 * Prec 64.320%
best acc: 65.050000
Epoch: [349][0/98]      Time 4.153 (4.153)      Data 4.130 (4.130)      Loss
0.9403 (0.9403)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.588 (3.588)      Loss 1.1553 (1.1553)    Prec 63.867%
(63.867%)
 * Prec 64.500%
best acc: 65.050000
Epoch: [350][0/98]      Time 4.192 (4.192)      Data 4.168 (4.168)      Loss
0.9881 (0.9881)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.607 (3.607)      Loss 1.1698 (1.1698)    Prec 65.234%
(65.234%)
 * Prec 64.360%
best acc: 65.050000
Epoch: [351][0/98]      Time 4.251 (4.251)      Data 4.229 (4.229)      Loss
0.9274 (0.9274)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.561 (3.561)      Loss 1.1597 (1.1597)    Prec 65.039%
(65.039%)
```

```
 * Prec 64.210%
best acc: 65.050000
Epoch: [352][0/98]      Time 4.294 (4.294)      Data 4.190 (4.190)      Loss
0.9942 (0.9942)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1872 (1.1872)    Prec 64.453%
(64.453%)
 * Prec 63.800%
best acc: 65.050000
Epoch: [353][0/98]      Time 4.168 (4.168)      Data 4.146 (4.146)      Loss
0.9639 (0.9639)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1502 (1.1502)    Prec 64.844%
(64.844%)
 * Prec 64.670%
best acc: 65.050000
Epoch: [354][0/98]      Time 4.153 (4.153)      Data 4.128 (4.128)      Loss
0.9606 (0.9606)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1807 (1.1807)    Prec 65.039%
(65.039%)
 * Prec 64.220%
best acc: 65.050000
Epoch: [355][0/98]      Time 4.258 (4.258)      Data 4.158 (4.158)      Loss
0.9509 (0.9509)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.932 (3.932)      Loss 1.1533 (1.1533)    Prec 65.625%
(65.625%)
 * Prec 64.360%
best acc: 65.050000
Epoch: [356][0/98]      Time 4.205 (4.205)      Data 4.183 (4.183)      Loss
0.9607 (0.9607)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.688 (3.688)      Loss 1.1652 (1.1652)    Prec 63.086%
(63.086%)
 * Prec 63.570%
best acc: 65.050000
Epoch: [357][0/98]      Time 4.199 (4.199)      Data 4.177 (4.177)      Loss
0.9624 (0.9624)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.681 (3.681)      Loss 1.1922 (1.1922)    Prec 62.891%
(62.891%)
 * Prec 63.580%
best acc: 65.050000
Epoch: [358][0/98]      Time 4.203 (4.203)      Data 4.180 (4.180)      Loss
0.9659 (0.9659)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.693 (3.693)      Loss 1.1570 (1.1570)    Prec 65.625%
```

```
(65.625%)
 * Prec 64.120%
best acc: 65.050000
Epoch: [359][0/98]      Time 4.154 (4.154)      Data 4.133 (4.133)      Loss
0.9504 (0.9504)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1394 (1.1394)    Prec 64.844%
(64.844%)
 * Prec 64.810%
best acc: 65.050000
Epoch: [360][0/98]      Time 4.150 (4.150)      Data 4.128 (4.128)      Loss
0.9852 (0.9852)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.654 (3.654)      Loss 1.1557 (1.1557)    Prec 64.453%
(64.453%)
 * Prec 64.590%
best acc: 65.050000
Epoch: [361][0/98]      Time 4.386 (4.386)      Data 4.284 (4.284)      Loss
0.9976 (0.9976)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.2020 (1.2020)    Prec 62.305%
(62.305%)
 * Prec 63.620%
best acc: 65.050000
Epoch: [362][0/98]      Time 4.297 (4.297)      Data 4.274 (4.274)      Loss
0.9204 (0.9204)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.790 (3.790)      Loss 1.1954 (1.1954)    Prec 63.672%
(63.672%)
 * Prec 64.770%
best acc: 65.050000
Epoch: [363][0/98]      Time 4.162 (4.162)      Data 4.139 (4.139)      Loss
0.9609 (0.9609)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.634 (3.634)      Loss 1.1695 (1.1695)    Prec 63.672%
(63.672%)
 * Prec 64.670%
best acc: 65.050000
Epoch: [364][0/98]      Time 4.187 (4.187)      Data 4.165 (4.165)      Loss
0.9523 (0.9523)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.605 (3.605)      Loss 1.2343 (1.2343)    Prec 61.914%
(61.914%)
 * Prec 63.740%
best acc: 65.050000
Epoch: [365][0/98]      Time 4.235 (4.235)      Data 4.213 (4.213)      Loss
0.9798 (0.9798)    Prec 68.750% (68.750%)
Validation starts
```

```
Test: [0/20]    Time 3.626 (3.626)      Loss 1.1915 (1.1915)    Prec 62.695%
(62.695%)
 * Prec 64.220%
best acc: 65.050000
Epoch: [366][0/98]      Time 4.170 (4.170)      Data 4.147 (4.147)      Loss
0.9756 (0.9756)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.613 (3.613)      Loss 1.1799 (1.1799)    Prec 63.281%
(63.281%)
 * Prec 64.230%
best acc: 65.050000
Epoch: [367][0/98]      Time 4.188 (4.188)      Data 4.166 (4.166)      Loss
0.9771 (0.9771)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1477 (1.1477)    Prec 65.820%
(65.820%)
 * Prec 64.420%
best acc: 65.050000
Epoch: [368][0/98]      Time 4.226 (4.226)      Data 4.204 (4.204)      Loss
0.8907 (0.8907)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1695 (1.1695)    Prec 64.062%
(64.062%)
 * Prec 64.200%
best acc: 65.050000
Epoch: [369][0/98]      Time 4.259 (4.259)      Data 4.154 (4.154)      Loss
0.9508 (0.9508)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.690 (3.690)      Loss 1.1485 (1.1485)    Prec 65.430%
(65.430%)
 * Prec 64.650%
best acc: 65.050000
Epoch: [370][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9532 (0.9532)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1665 (1.1665)    Prec 64.062%
(64.062%)
 * Prec 63.870%
best acc: 65.050000
Epoch: [371][0/98]      Time 4.257 (4.257)      Data 4.235 (4.235)      Loss
0.9944 (0.9944)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.576 (3.576)      Loss 1.1884 (1.1884)    Prec 62.305%
(62.305%)
 * Prec 63.860%
best acc: 65.050000
Epoch: [372][0/98]      Time 4.169 (4.169)      Data 4.142 (4.142)      Loss
0.9699 (0.9699)    Prec 66.406% (66.406%)
```

```
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1594 (1.1594)    Prec 65.430%
(65.430%)
 * Prec 64.160%
best acc: 65.050000
Epoch: [373][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9785 (0.9785)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1802 (1.1802)    Prec 63.281%
(63.281%)
 * Prec 64.050%
best acc: 65.050000
Epoch: [374][0/98]      Time 4.138 (4.138)      Data 4.116 (4.116)      Loss
0.9790 (0.9790)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.695 (3.695)      Loss 1.1403 (1.1403)    Prec 65.234%
(65.234%)
 * Prec 64.830%
best acc: 65.050000
Epoch: [375][0/98]      Time 4.175 (4.175)      Data 4.153 (4.153)      Loss
0.9173 (0.9173)    Prec 74.023% (74.023%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.1724 (1.1724)    Prec 63.086%
(63.086%)
 * Prec 64.140%
best acc: 65.050000
Epoch: [376][0/98]      Time 4.172 (4.172)      Data 4.150 (4.150)      Loss
0.8959 (0.8959)    Prec 73.828% (73.828%)
Validation starts
Test: [0/20]    Time 3.601 (3.601)      Loss 1.1666 (1.1666)    Prec 62.891%
(62.891%)
 * Prec 63.700%
best acc: 65.050000
Epoch: [377][0/98]      Time 4.183 (4.183)      Data 4.162 (4.162)      Loss
0.9695 (0.9695)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1725 (1.1725)    Prec 63.672%
(63.672%)
 * Prec 64.700%
best acc: 65.050000
Epoch: [378][0/98]      Time 4.153 (4.153)      Data 4.132 (4.132)      Loss
0.9500 (0.9500)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.593 (3.593)      Loss 1.1564 (1.1564)    Prec 64.453%
(64.453%)
 * Prec 64.770%
best acc: 65.050000
Epoch: [379][0/98]      Time 4.163 (4.163)      Data 4.142 (4.142)      Loss
```

```
0.9928 (0.9928)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1529 (1.1529)    Prec 63.672%
(63.672%)
 * Prec 64.330%
best acc: 65.050000
Epoch: [380][0/98]      Time 4.173 (4.173)      Data 4.150 (4.150)      Loss
0.9585 (0.9585)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.664 (3.664)      Loss 1.1734 (1.1734)    Prec 65.430%
(65.430%)
 * Prec 64.590%
best acc: 65.050000
Epoch: [381][0/98]      Time 4.203 (4.203)      Data 4.179 (4.179)      Loss
0.8836 (0.8836)    Prec 75.000% (75.000%)
Validation starts
Test: [0/20]    Time 3.698 (3.698)      Loss 1.1764 (1.1764)    Prec 64.062%
(64.062%)
 * Prec 64.050%
best acc: 65.050000
Epoch: [382][0/98]      Time 4.236 (4.236)      Data 4.212 (4.212)      Loss
0.9013 (0.9013)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.632 (3.632)      Loss 1.1982 (1.1982)    Prec 62.695%
(62.695%)
 * Prec 63.800%
best acc: 65.050000
Epoch: [383][0/98]      Time 4.188 (4.188)      Data 4.166 (4.166)      Loss
0.9561 (0.9561)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1770 (1.1770)    Prec 63.867%
(63.867%)
 * Prec 64.420%
best acc: 65.050000
Epoch: [384][0/98]      Time 4.185 (4.185)      Data 4.161 (4.161)      Loss
0.9580 (0.9580)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.628 (3.628)      Loss 1.1810 (1.1810)    Prec 63.477%
(63.477%)
 * Prec 64.240%
best acc: 65.050000
Epoch: [385][0/98]      Time 4.194 (4.194)      Data 4.173 (4.173)      Loss
0.9382 (0.9382)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.605 (3.605)      Loss 1.1629 (1.1629)    Prec 64.258%
(64.258%)
 * Prec 64.400%
best acc: 65.050000
```

```
Epoch: [386][0/98]      Time 4.173 (4.173)      Data 4.151 (4.151)      Loss
0.9466 (0.9466)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1597 (1.1597)    Prec 63.672%
(63.672%)
 * Prec 64.610%
best acc: 65.050000
Epoch: [387][0/98]      Time 4.157 (4.157)      Data 4.136 (4.136)      Loss
0.9620 (0.9620)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.615 (3.615)      Loss 1.1291 (1.1291)    Prec 64.453%
(64.453%)
 * Prec 64.730%
best acc: 65.050000
Epoch: [388][0/98]      Time 4.167 (4.167)      Data 4.144 (4.144)      Loss
0.9604 (0.9604)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.633 (3.633)      Loss 1.1543 (1.1543)    Prec 64.258%
(64.258%)
 * Prec 63.740%
best acc: 65.050000
Epoch: [389][0/98]      Time 4.170 (4.170)      Data 4.148 (4.148)      Loss
0.9295 (0.9295)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.610 (3.610)      Loss 1.1461 (1.1461)    Prec 65.820%
(65.820%)
 * Prec 64.290%
best acc: 65.050000
Epoch: [390][0/98]      Time 4.267 (4.267)      Data 4.161 (4.161)      Loss
0.9996 (0.9996)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.579 (3.579)      Loss 1.1453 (1.1453)    Prec 64.844%
(64.844%)
 * Prec 64.580%
best acc: 65.050000
Epoch: [391][0/98]      Time 4.265 (4.265)      Data 4.162 (4.162)      Loss
0.9682 (0.9682)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1467 (1.1467)    Prec 64.648%
(64.648%)
 * Prec 64.220%
best acc: 65.050000
Epoch: [392][0/98]      Time 4.291 (4.291)      Data 4.187 (4.187)      Loss
0.9918 (0.9918)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1964 (1.1964)    Prec 63.281%
(63.281%)
 * Prec 64.540%
```

```
best acc: 65.050000
Epoch: [393][0/98]      Time 4.257 (4.257)      Data 4.154 (4.154)      Loss
0.9819 (0.9819)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1690 (1.1690)    Prec 63.867%
(63.867%)
 * Prec 64.710%
best acc: 65.050000
Epoch: [394][0/98]      Time 4.165 (4.165)      Data 4.138 (4.138)      Loss
0.9396 (0.9396)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.688 (3.688)      Loss 1.1794 (1.1794)    Prec 63.086%
(63.086%)
 * Prec 63.840%
best acc: 65.050000
Epoch: [395][0/98]      Time 4.149 (4.149)      Data 4.125 (4.125)      Loss
0.9918 (0.9918)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.717 (3.717)      Loss 1.1867 (1.1867)    Prec 62.500%
(62.500%)
 * Prec 64.090%
best acc: 65.050000
Epoch: [396][0/98]      Time 4.159 (4.159)      Data 4.136 (4.136)      Loss
0.9329 (0.9329)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.566 (3.566)      Loss 1.1635 (1.1635)    Prec 65.430%
(65.430%)
 * Prec 64.510%
best acc: 65.050000
Epoch: [397][0/98]      Time 4.217 (4.217)      Data 4.196 (4.196)      Loss
0.9880 (0.9880)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.591 (3.591)      Loss 1.1568 (1.1568)    Prec 65.820%
(65.820%)
 * Prec 64.200%
best acc: 65.050000
Epoch: [398][0/98]      Time 4.166 (4.166)      Data 4.144 (4.144)      Loss
0.9882 (0.9882)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1474 (1.1474)    Prec 65.625%
(65.625%)
 * Prec 64.790%
best acc: 65.050000
Epoch: [399][0/98]      Time 4.151 (4.151)      Data 4.130 (4.130)      Loss
0.9688 (0.9688)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.682 (3.682)      Loss 1.1482 (1.1482)    Prec 64.453%
(64.453%)
```

```
 * Prec 64.580%
best acc: 65.050000
Epoch: [400][0/98]      Time 4.199 (4.199)      Data 4.174 (4.174)      Loss
0.9615 (0.9615)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1745 (1.1745)    Prec 63.867%
(63.867%)
 * Prec 64.480%
best acc: 65.050000
Epoch: [401][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9951 (0.9951)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.573 (3.573)      Loss 1.1529 (1.1529)    Prec 63.086%
(63.086%)
 * Prec 63.560%
best acc: 65.050000
Epoch: [402][0/98]      Time 4.133 (4.133)      Data 4.112 (4.112)      Loss
0.9502 (0.9502)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.594 (3.594)      Loss 1.1521 (1.1521)    Prec 64.844%
(64.844%)
 * Prec 64.720%
best acc: 65.050000
Epoch: [403][0/98]      Time 4.164 (4.164)      Data 4.142 (4.142)      Loss
0.9778 (0.9778)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1480 (1.1480)    Prec 63.672%
(63.672%)
 * Prec 64.520%
best acc: 65.050000
Epoch: [404][0/98]      Time 4.108 (4.108)      Data 4.086 (4.086)      Loss
0.9589 (0.9589)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.542 (3.542)      Loss 1.1762 (1.1762)    Prec 63.867%
(63.867%)
 * Prec 64.450%
best acc: 65.050000
Epoch: [405][0/98]      Time 4.185 (4.185)      Data 4.161 (4.161)      Loss
0.9739 (0.9739)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.625 (3.625)      Loss 1.1467 (1.1467)    Prec 65.820%
(65.820%)
 * Prec 64.540%
best acc: 65.050000
Epoch: [406][0/98]      Time 4.129 (4.129)      Data 4.107 (4.107)      Loss
0.9572 (0.9572)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1822 (1.1822)    Prec 63.281%
```

```
(63.281%)
 * Prec 64.160%
best acc: 65.050000
Epoch: [407][0/98]      Time 4.199 (4.199)      Data 4.177 (4.177)      Loss
0.9599 (0.9599)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.589 (3.589)      Loss 1.1564 (1.1564)    Prec 64.062%
(64.062%)
 * Prec 64.010%
best acc: 65.050000
Epoch: [408][0/98]      Time 4.232 (4.232)      Data 4.210 (4.210)      Loss
0.9703 (0.9703)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.577 (3.577)      Loss 1.1462 (1.1462)    Prec 64.453%
(64.453%)
 * Prec 64.640%
best acc: 65.050000
Epoch: [409][0/98]      Time 4.123 (4.123)      Data 4.099 (4.099)      Loss
0.9647 (0.9647)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.555 (3.555)      Loss 1.1518 (1.1518)    Prec 63.477%
(63.477%)
 * Prec 64.170%
best acc: 65.050000
Epoch: [410][0/98]      Time 4.194 (4.194)      Data 4.172 (4.172)      Loss
0.9518 (0.9518)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.579 (3.579)      Loss 1.1509 (1.1509)    Prec 63.867%
(63.867%)
 * Prec 64.250%
best acc: 65.050000
Epoch: [411][0/98]      Time 4.129 (4.129)      Data 4.109 (4.109)      Loss
0.9942 (0.9942)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.558 (3.558)      Loss 1.1751 (1.1751)    Prec 63.086%
(63.086%)
 * Prec 63.950%
best acc: 65.050000
Epoch: [412][0/98]      Time 4.131 (4.131)      Data 4.109 (4.109)      Loss
0.9921 (0.9921)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.580 (3.580)      Loss 1.1611 (1.1611)    Prec 63.867%
(63.867%)
 * Prec 64.240%
best acc: 65.050000
Epoch: [413][0/98]      Time 4.121 (4.121)      Data 4.099 (4.099)      Loss
0.9684 (0.9684)    Prec 67.969% (67.969%)
Validation starts
```

```
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1907 (1.1907)    Prec 65.039%
(65.039%)
 * Prec 64.420%
best acc: 65.050000
Epoch: [414][0/98]      Time 4.114 (4.114)      Data 4.088 (4.088)      Loss
0.9458 (0.9458)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.570 (3.570)      Loss 1.1929 (1.1929)    Prec 63.086%
(63.086%)
 * Prec 64.370%
best acc: 65.050000
Epoch: [415][0/98]      Time 4.115 (4.115)      Data 4.093 (4.093)      Loss
0.9066 (0.9066)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1422 (1.1422)    Prec 64.062%
(64.062%)
 * Prec 64.240%
best acc: 65.050000
Epoch: [416][0/98]      Time 4.111 (4.111)      Data 4.089 (4.089)      Loss
0.9581 (0.9581)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.650 (3.650)      Loss 1.1327 (1.1327)    Prec 64.062%
(64.062%)
 * Prec 64.640%
best acc: 65.050000
Epoch: [417][0/98]      Time 4.103 (4.103)      Data 4.082 (4.082)      Loss
0.9516 (0.9516)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1605 (1.1605)    Prec 63.477%
(63.477%)
 * Prec 64.030%
best acc: 65.050000
Epoch: [418][0/98]      Time 4.093 (4.093)      Data 4.072 (4.072)      Loss
0.9866 (0.9866)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.637 (3.637)      Loss 1.1497 (1.1497)    Prec 65.039%
(65.039%)
 * Prec 64.450%
best acc: 65.050000
Epoch: [419][0/98]      Time 4.138 (4.138)      Data 4.115 (4.115)      Loss
0.9770 (0.9770)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.565 (3.565)      Loss 1.1615 (1.1615)    Prec 63.477%
(63.477%)
 * Prec 64.560%
best acc: 65.050000
Epoch: [420][0/98]      Time 4.117 (4.117)      Data 4.096 (4.096)      Loss
0.9428 (0.9428)    Prec 69.727% (69.727%)
```

```
Validation starts
Test: [0/20]    Time 3.594 (3.594)      Loss 1.1559 (1.1559)    Prec 64.258%
(64.258%)
 * Prec 63.980%
best acc: 65.050000
Epoch: [421][0/98]      Time 4.105 (4.105)      Data 4.084 (4.084)      Loss
0.9796 (0.9796)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1807 (1.1807)    Prec 64.258%
(64.258%)
 * Prec 64.810%
best acc: 65.050000
Epoch: [422][0/98]      Time 4.141 (4.141)      Data 4.119 (4.119)      Loss
0.9440 (0.9440)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.639 (3.639)      Loss 1.1696 (1.1696)    Prec 65.430%
(65.430%)
 * Prec 64.420%
best acc: 65.050000
Epoch: [423][0/98]      Time 4.150 (4.150)      Data 4.125 (4.125)      Loss
0.9613 (0.9613)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.611 (3.611)      Loss 1.1616 (1.1616)    Prec 63.672%
(63.672%)
 * Prec 64.590%
best acc: 65.050000
Epoch: [424][0/98]      Time 4.092 (4.092)      Data 4.071 (4.071)      Loss
0.9323 (0.9323)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.643 (3.643)      Loss 1.1492 (1.1492)    Prec 64.648%
(64.648%)
 * Prec 64.560%
best acc: 65.050000
Epoch: [425][0/98]      Time 4.142 (4.142)      Data 4.120 (4.120)      Loss
0.9650 (0.9650)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.684 (3.684)      Loss 1.1590 (1.1590)    Prec 64.258%
(64.258%)
 * Prec 64.600%
best acc: 65.050000
Epoch: [426][0/98]      Time 4.136 (4.136)      Data 4.114 (4.114)      Loss
0.9210 (0.9210)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.667 (3.667)      Loss 1.1436 (1.1436)    Prec 65.039%
(65.039%)
 * Prec 65.060%
best acc: 65.060000
Epoch: [427][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
```

```
0.9431 (0.9431)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.651 (3.651)      Loss 1.1466 (1.1466)    Prec 66.211%
(66.211%)
 * Prec 64.630%
best acc: 65.060000
Epoch: [428][0/98]      Time 4.142 (4.142)      Data 4.119 (4.119)      Loss
0.9941 (0.9941)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1900 (1.1900)    Prec 64.844%
(64.844%)
 * Prec 64.310%
best acc: 65.060000
Epoch: [429][0/98]      Time 4.138 (4.138)      Data 4.117 (4.117)      Loss
0.9097 (0.9097)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.575 (3.575)      Loss 1.1525 (1.1525)    Prec 64.258%
(64.258%)
 * Prec 64.370%
best acc: 65.060000
Epoch: [430][0/98]      Time 4.135 (4.135)      Data 4.112 (4.112)      Loss
0.9577 (0.9577)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1868 (1.1868)    Prec 64.453%
(64.453%)
 * Prec 63.690%
best acc: 65.060000
Epoch: [431][0/98]      Time 4.202 (4.202)      Data 4.101 (4.101)      Loss
0.9452 (0.9452)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.671 (3.671)      Loss 1.1496 (1.1496)    Prec 65.820%
(65.820%)
 * Prec 64.400%
best acc: 65.060000
Epoch: [432][0/98]      Time 4.145 (4.145)      Data 4.123 (4.123)      Loss
0.9514 (0.9514)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.657 (3.657)      Loss 1.1700 (1.1700)    Prec 63.086%
(63.086%)
 * Prec 63.660%
best acc: 65.060000
Epoch: [433][0/98]      Time 4.251 (4.251)      Data 4.147 (4.147)      Loss
0.9790 (0.9790)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.677 (3.677)      Loss 1.1767 (1.1767)    Prec 63.477%
(63.477%)
 * Prec 63.970%
best acc: 65.060000
```

```
Epoch: [434][0/98]      Time 4.251 (4.251)      Data 4.229 (4.229)      Loss
0.9994 (0.9994)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1302 (1.1302)    Prec 65.625%
(65.625%)
 * Prec 64.440%
best acc: 65.060000
Epoch: [435][0/98]      Time 4.118 (4.118)      Data 4.096 (4.096)      Loss
0.9962 (0.9962)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.594 (3.594)      Loss 1.1841 (1.1841)    Prec 63.672%
(63.672%)
 * Prec 64.400%
best acc: 65.060000
Epoch: [436][0/98]      Time 4.142 (4.142)      Data 4.120 (4.120)      Loss
0.9179 (0.9179)    Prec 73.047% (73.047%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1628 (1.1628)    Prec 63.281%
(63.281%)
 * Prec 64.370%
best acc: 65.060000
Epoch: [437][0/98]      Time 4.212 (4.212)      Data 4.113 (4.113)      Loss
0.9547 (0.9547)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.718 (3.718)      Loss 1.1653 (1.1653)    Prec 63.477%
(63.477%)
 * Prec 64.010%
best acc: 65.060000
Epoch: [438][0/98]      Time 4.165 (4.165)      Data 4.143 (4.143)      Loss
0.9784 (0.9784)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.638 (3.638)      Loss 1.1565 (1.1565)    Prec 66.211%
(66.211%)
 * Prec 64.540%
best acc: 65.060000
Epoch: [439][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9600 (0.9600)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.541 (3.541)      Loss 1.1817 (1.1817)    Prec 63.477%
(63.477%)
 * Prec 64.780%
best acc: 65.060000
Epoch: [440][0/98]      Time 4.210 (4.210)      Data 4.109 (4.109)      Loss
0.9528 (0.9528)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.673 (3.673)      Loss 1.1575 (1.1575)    Prec 64.062%
(64.062%)
 * Prec 64.250%
```

```
best acc: 65.060000
Epoch: [441][0/98]      Time 4.140 (4.140)      Data 4.118 (4.118)      Loss
0.9667 (0.9667)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1725 (1.1725)    Prec 64.258%
(64.258%)
 * Prec 64.730%
best acc: 65.060000
Epoch: [442][0/98]      Time 4.162 (4.162)      Data 4.139 (4.139)      Loss
0.9526 (0.9526)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.643 (3.643)      Loss 1.1622 (1.1622)    Prec 65.039%
(65.039%)
 * Prec 64.950%
best acc: 65.060000
Epoch: [443][0/98]      Time 4.128 (4.128)      Data 4.106 (4.106)      Loss
0.9382 (0.9382)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1605 (1.1605)    Prec 64.062%
(64.062%)
 * Prec 64.680%
best acc: 65.060000
Epoch: [444][0/98]      Time 4.142 (4.142)      Data 4.119 (4.119)      Loss
0.9643 (0.9643)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.570 (3.570)      Loss 1.1640 (1.1640)    Prec 65.625%
(65.625%)
 * Prec 64.150%
best acc: 65.060000
Epoch: [445][0/98]      Time 4.129 (4.129)      Data 4.108 (4.108)      Loss
0.9765 (0.9765)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.649 (3.649)      Loss 1.1693 (1.1693)    Prec 65.430%
(65.430%)
 * Prec 64.610%
best acc: 65.060000
Epoch: [446][0/98]      Time 4.146 (4.146)      Data 4.119 (4.119)      Loss
0.9281 (0.9281)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.1874 (1.1874)    Prec 63.672%
(63.672%)
 * Prec 64.380%
best acc: 65.060000
Epoch: [447][0/98]      Time 4.153 (4.153)      Data 4.130 (4.130)      Loss
0.9444 (0.9444)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.656 (3.656)      Loss 1.1524 (1.1524)    Prec 64.453%
(64.453%)
```

```
 * Prec 64.190%
best acc: 65.060000
Epoch: [448][0/98]      Time 4.189 (4.189)      Data 4.168 (4.168)      Loss
0.9788 (0.9788)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.591 (3.591)      Loss 1.1653 (1.1653)    Prec 64.062%
(64.062%)
 * Prec 64.060%
best acc: 65.060000
Epoch: [449][0/98]      Time 4.463 (4.463)      Data 4.441 (4.441)      Loss
1.0128 (1.0128)    Prec 64.453% (64.453%)
Validation starts
Test: [0/20]    Time 4.403 (4.403)      Loss 1.1760 (1.1760)    Prec 63.477%
(63.477%)
 * Prec 64.300%
best acc: 65.060000
Epoch: [450][0/98]      Time 4.888 (4.888)      Data 4.786 (4.786)      Loss
0.9529 (0.9529)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 4.783 (4.783)      Loss 1.1471 (1.1471)    Prec 65.430%
(65.430%)
 * Prec 64.480%
best acc: 65.060000
Epoch: [451][0/98]      Time 4.614 (4.614)      Data 4.592 (4.592)      Loss
0.9645 (0.9645)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.616 (3.616)      Loss 1.1551 (1.1551)    Prec 64.844%
(64.844%)
 * Prec 64.670%
best acc: 65.060000
Epoch: [452][0/98]      Time 4.367 (4.367)      Data 4.344 (4.344)      Loss
0.9232 (0.9232)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1583 (1.1583)    Prec 64.062%
(64.062%)
 * Prec 64.640%
best acc: 65.060000
Epoch: [453][0/98]      Time 4.391 (4.391)      Data 4.289 (4.289)      Loss
1.0160 (1.0160)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1929 (1.1929)    Prec 63.086%
(63.086%)
 * Prec 64.360%
best acc: 65.060000
Epoch: [454][0/98]      Time 4.148 (4.148)      Data 4.127 (4.127)      Loss
0.9281 (0.9281)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1846 (1.1846)    Prec 63.086%
```

```
(63.086%)
 * Prec 64.860%
best acc: 65.060000
Epoch: [455][0/98]      Time 4.150 (4.150)      Data 4.128 (4.128)      Loss
0.9593 (0.9593)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.1686 (1.1686)    Prec 63.672%
(63.672%)
 * Prec 64.010%
best acc: 65.060000
Epoch: [456][0/98]      Time 4.213 (4.213)      Data 4.192 (4.192)      Loss
0.9363 (0.9363)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1400 (1.1400)    Prec 65.234%
(65.234%)
 * Prec 64.940%
best acc: 65.060000
Epoch: [457][0/98]      Time 4.151 (4.151)      Data 4.129 (4.129)      Loss
0.9502 (0.9502)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1872 (1.1872)    Prec 63.672%
(63.672%)
 * Prec 64.550%
best acc: 65.060000
Epoch: [458][0/98]      Time 4.124 (4.124)      Data 4.102 (4.102)      Loss
0.9500 (0.9500)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.872 (3.872)      Loss 1.1542 (1.1542)    Prec 64.453%
(64.453%)
 * Prec 64.110%
best acc: 65.060000
Epoch: [459][0/98]      Time 4.404 (4.404)      Data 4.277 (4.277)      Loss
0.9807 (0.9807)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.857 (3.857)      Loss 1.1585 (1.1585)    Prec 63.867%
(63.867%)
 * Prec 64.770%
best acc: 65.060000
Epoch: [460][0/98]      Time 4.543 (4.543)      Data 4.440 (4.440)      Loss
0.9724 (0.9724)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1236 (1.1236)    Prec 67.188%
(67.188%)
 * Prec 64.730%
best acc: 65.060000
Epoch: [461][0/98]      Time 4.143 (4.143)      Data 4.121 (4.121)      Loss
0.9898 (0.9898)    Prec 67.578% (67.578%)
Validation starts
```

```
Test: [0/20]    Time 3.604 (3.604)      Loss 1.1437 (1.1437)    Prec 66.211%
(66.211%)
 * Prec 64.640%
best acc: 65.060000
Epoch: [462][0/98]      Time 4.155 (4.155)      Data 4.134 (4.134)      Loss
0.9480 (0.9480)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.605 (3.605)      Loss 1.1536 (1.1536)    Prec 65.430%
(65.430%)
 * Prec 64.120%
best acc: 65.060000
Epoch: [463][0/98]      Time 4.258 (4.258)      Data 4.237 (4.237)      Loss
0.9921 (0.9921)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1549 (1.1549)    Prec 65.430%
(65.430%)
 * Prec 64.720%
best acc: 65.060000
Epoch: [464][0/98]      Time 4.215 (4.215)      Data 4.191 (4.191)      Loss
0.9629 (0.9629)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1235 (1.1235)    Prec 66.406%
(66.406%)
 * Prec 64.700%
best acc: 65.060000
Epoch: [465][0/98]      Time 4.195 (4.195)      Data 4.170 (4.170)      Loss
0.9360 (0.9360)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.604 (3.604)      Loss 1.1725 (1.1725)    Prec 63.477%
(63.477%)
 * Prec 64.290%
best acc: 65.060000
Epoch: [466][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9579 (0.9579)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1618 (1.1618)    Prec 65.039%
(65.039%)
 * Prec 64.380%
best acc: 65.060000
Epoch: [467][0/98]      Time 4.184 (4.184)      Data 4.161 (4.161)      Loss
0.9180 (0.9180)    Prec 74.609% (74.609%)
Validation starts
Test: [0/20]    Time 3.552 (3.552)      Loss 1.1567 (1.1567)    Prec 63.867%
(63.867%)
 * Prec 64.210%
best acc: 65.060000
Epoch: [468][0/98]      Time 4.117 (4.117)      Data 4.096 (4.096)      Loss
0.9533 (0.9533)    Prec 70.312% (70.312%)
```

```
Validation starts
Test: [0/20]    Time 3.642 (3.642)      Loss 1.1585 (1.1585)    Prec 63.867%
(63.867%)
 * Prec 64.130%
best acc: 65.060000
Epoch: [469][0/98]      Time 4.132 (4.132)      Data 4.109 (4.109)      Loss
0.9316 (0.9316)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.595 (3.595)      Loss 1.1794 (1.1794)    Prec 63.281%
(63.281%)
 * Prec 64.050%
best acc: 65.060000
Epoch: [470][0/98]      Time 4.146 (4.146)      Data 4.123 (4.123)      Loss
0.9507 (0.9507)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.686 (3.686)      Loss 1.1437 (1.1437)    Prec 64.648%
(64.648%)
 * Prec 64.000%
best acc: 65.060000
Epoch: [471][0/98]      Time 4.114 (4.114)      Data 4.093 (4.093)      Loss
1.0055 (1.0055)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.636 (3.636)      Loss 1.1539 (1.1539)    Prec 64.062%
(64.062%)
 * Prec 64.510%
best acc: 65.060000
Epoch: [472][0/98]      Time 4.122 (4.122)      Data 4.100 (4.100)      Loss
1.0115 (1.0115)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.560 (3.560)      Loss 1.1953 (1.1953)    Prec 62.500%
(62.500%)
 * Prec 64.400%
best acc: 65.060000
Epoch: [473][0/98]      Time 4.247 (4.247)      Data 4.145 (4.145)      Loss
0.9465 (0.9465)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.548 (3.548)      Loss 1.1508 (1.1508)    Prec 64.258%
(64.258%)
 * Prec 64.880%
best acc: 65.060000
Epoch: [474][0/98]      Time 4.139 (4.139)      Data 4.117 (4.117)      Loss
0.9679 (0.9679)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.585 (3.585)      Loss 1.1487 (1.1487)    Prec 63.281%
(63.281%)
 * Prec 64.530%
best acc: 65.060000
Epoch: [475][0/98]      Time 4.124 (4.124)      Data 4.102 (4.102)      Loss
```

```
0.9755 (0.9755)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.547 (3.547)      Loss 1.1714 (1.1714)    Prec 63.281%
(63.281%)
 * Prec 64.070%
best acc: 65.060000
Epoch: [476][0/98]      Time 4.141 (4.141)      Data 4.119 (4.119)      Loss
0.9874 (0.9874)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.527 (3.527)      Loss 1.1586 (1.1586)    Prec 63.867%
(63.867%)
 * Prec 64.570%
best acc: 65.060000
Epoch: [477][0/98]      Time 4.223 (4.223)      Data 4.121 (4.121)      Loss
0.9414 (0.9414)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1368 (1.1368)    Prec 64.648%
(64.648%)
 * Prec 64.970%
best acc: 65.060000
Epoch: [478][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9342 (0.9342)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.567 (3.567)      Loss 1.1545 (1.1545)    Prec 64.258%
(64.258%)
 * Prec 64.170%
best acc: 65.060000
Epoch: [479][0/98]      Time 4.115 (4.115)      Data 4.094 (4.094)      Loss
0.9994 (0.9994)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.527 (3.527)      Loss 1.1674 (1.1674)    Prec 63.672%
(63.672%)
 * Prec 64.680%
best acc: 65.060000
Epoch: [480][0/98]      Time 4.125 (4.125)      Data 4.102 (4.102)      Loss
0.9390 (0.9390)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.610 (3.610)      Loss 1.1861 (1.1861)    Prec 64.062%
(64.062%)
 * Prec 64.500%
best acc: 65.060000
Epoch: [481][0/98]      Time 4.151 (4.151)      Data 4.128 (4.128)      Loss
0.9855 (0.9855)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.1369 (1.1369)    Prec 63.672%
(63.672%)
 * Prec 64.490%
best acc: 65.060000
```

```
Epoch: [482][0/98]      Time 4.182 (4.182)      Data 4.160 (4.160)      Loss
0.9617 (0.9617)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.630 (3.630)      Loss 1.1655 (1.1655)    Prec 63.086%
(63.086%)
 * Prec 64.530%
best acc: 65.060000
Epoch: [483][0/98]      Time 4.198 (4.198)      Data 4.176 (4.176)      Loss
0.9461 (0.9461)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.1393 (1.1393)    Prec 64.258%
(64.258%)
 * Prec 64.850%
best acc: 65.060000
Epoch: [484][0/98]      Time 4.132 (4.132)      Data 4.112 (4.112)      Loss
0.9547 (0.9547)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1487 (1.1487)    Prec 65.820%
(65.820%)
 * Prec 64.160%
best acc: 65.060000
Epoch: [485][0/98]      Time 4.202 (4.202)      Data 4.180 (4.180)      Loss
0.9886 (0.9886)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.661 (3.661)      Loss 1.1755 (1.1755)    Prec 63.086%
(63.086%)
 * Prec 63.610%
best acc: 65.060000
Epoch: [486][0/98]      Time 4.143 (4.143)      Data 4.120 (4.120)      Loss
0.9521 (0.9521)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.660 (3.660)      Loss 1.1252 (1.1252)    Prec 64.648%
(64.648%)
 * Prec 63.810%
best acc: 65.060000
Epoch: [487][0/98]      Time 4.132 (4.132)      Data 4.110 (4.110)      Loss
0.9757 (0.9757)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.580 (3.580)      Loss 1.1280 (1.1280)    Prec 64.844%
(64.844%)
 * Prec 64.320%
best acc: 65.060000
Epoch: [488][0/98]      Time 4.202 (4.202)      Data 4.097 (4.097)      Loss
0.9398 (0.9398)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.583 (3.583)      Loss 1.1448 (1.1448)    Prec 63.867%
(63.867%)
 * Prec 63.840%
```

```
best acc: 65.060000
Epoch: [489][0/98]      Time 4.210 (4.210)      Data 4.106 (4.106)      Loss
0.9639 (0.9639)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.652 (3.652)      Loss 1.1401 (1.1401)    Prec 66.602%
(66.602%)
 * Prec 64.750%
best acc: 65.060000
Epoch: [490][0/98]      Time 4.130 (4.130)      Data 4.108 (4.108)      Loss
0.9380 (0.9380)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.577 (3.577)      Loss 1.1687 (1.1687)    Prec 63.672%
(63.672%)
 * Prec 63.950%
best acc: 65.060000
Epoch: [491][0/98]      Time 4.150 (4.150)      Data 4.128 (4.128)      Loss
0.9718 (0.9718)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.545 (3.545)      Loss 1.1326 (1.1326)    Prec 66.211%
(66.211%)
 * Prec 64.330%
best acc: 65.060000
Epoch: [492][0/98]      Time 4.203 (4.203)      Data 4.177 (4.177)      Loss
0.9543 (0.9543)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.658 (3.658)      Loss 1.1605 (1.1605)    Prec 62.891%
(62.891%)
 * Prec 63.760%
best acc: 65.060000
Epoch: [493][0/98]      Time 4.144 (4.144)      Data 4.122 (4.122)      Loss
0.9056 (0.9056)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.565 (3.565)      Loss 1.1425 (1.1425)    Prec 64.648%
(64.648%)
 * Prec 65.000%
best acc: 65.060000
Epoch: [494][0/98]      Time 4.220 (4.220)      Data 4.118 (4.118)      Loss
0.9711 (0.9711)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.580 (3.580)      Loss 1.1665 (1.1665)    Prec 62.891%
(62.891%)
 * Prec 64.340%
best acc: 65.060000
Epoch: [495][0/98]      Time 4.229 (4.229)      Data 4.126 (4.126)      Loss
0.9680 (0.9680)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1427 (1.1427)    Prec 66.016%
(66.016%)
```

```
 * Prec 64.550%
best acc: 65.060000
Epoch: [496][0/98]      Time 4.222 (4.222)      Data 4.121 (4.121)      Loss
0.9782 (0.9782)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.631 (3.631)      Loss 1.1402 (1.1402)    Prec 63.867%
(63.867%)
 * Prec 64.320%
best acc: 65.060000
Epoch: [497][0/98]      Time 4.205 (4.205)      Data 4.101 (4.101)      Loss
0.8883 (0.8883)    Prec 75.391% (75.391%)
Validation starts
Test: [0/20]    Time 3.677 (3.677)      Loss 1.1482 (1.1482)    Prec 65.625%
(65.625%)
 * Prec 63.960%
best acc: 65.060000
Epoch: [498][0/98]      Time 4.145 (4.145)      Data 4.120 (4.120)      Loss
0.9477 (0.9477)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.648 (3.648)      Loss 1.1541 (1.1541)    Prec 66.211%
(66.211%)
 * Prec 64.870%
best acc: 65.060000
Epoch: [499][0/98]      Time 4.160 (4.160)      Data 4.136 (4.136)      Loss
0.9162 (0.9162)    Prec 74.023% (74.023%)
Validation starts
Test: [0/20]    Time 3.647 (3.647)      Loss 1.1578 (1.1578)    Prec 63.672%
(63.672%)
 * Prec 64.030%
best acc: 65.060000
Epoch: [500][0/98]      Time 4.147 (4.147)      Data 4.123 (4.123)      Loss
0.9348 (0.9348)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1393 (1.1393)    Prec 64.844%
(64.844%)
 * Prec 64.780%
best acc: 65.060000
Epoch: [501][0/98]      Time 4.171 (4.171)      Data 4.149 (4.149)      Loss
0.9702 (0.9702)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.584 (3.584)      Loss 1.1494 (1.1494)    Prec 66.602%
(66.602%)
 * Prec 64.920%
best acc: 65.060000
Epoch: [502][0/98]      Time 4.150 (4.150)      Data 4.129 (4.129)      Loss
0.9674 (0.9674)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.697 (3.697)      Loss 1.1386 (1.1386)    Prec 64.844%
```

```
(64.844%)
 * Prec 64.650%
best acc: 65.060000
Epoch: [503][0/98]      Time 4.167 (4.167)      Data 4.146 (4.146)      Loss
0.9130 (0.9130)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.583 (3.583)      Loss 1.1543 (1.1543)    Prec 63.672%
(63.672%)
 * Prec 64.710%
best acc: 65.060000
Epoch: [504][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
0.9494 (0.9494)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.654 (3.654)      Loss 1.1612 (1.1612)    Prec 64.062%
(64.062%)
 * Prec 64.050%
best acc: 65.060000
Epoch: [505][0/98]      Time 4.200 (4.200)      Data 4.178 (4.178)      Loss
0.9625 (0.9625)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.662 (3.662)      Loss 1.1711 (1.1711)    Prec 65.234%
(65.234%)
 * Prec 64.260%
best acc: 65.060000
Epoch: [506][0/98]      Time 4.151 (4.151)      Data 4.125 (4.125)      Loss
0.9374 (0.9374)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1501 (1.1501)    Prec 64.648%
(64.648%)
 * Prec 64.770%
best acc: 65.060000
Epoch: [507][0/98]      Time 4.199 (4.199)      Data 4.179 (4.179)      Loss
0.9252 (0.9252)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1518 (1.1518)    Prec 64.453%
(64.453%)
 * Prec 64.710%
best acc: 65.060000
Epoch: [508][0/98]      Time 4.151 (4.151)      Data 4.129 (4.129)      Loss
0.9234 (0.9234)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1573 (1.1573)    Prec 63.867%
(63.867%)
 * Prec 63.710%
best acc: 65.060000
Epoch: [509][0/98]      Time 4.131 (4.131)      Data 4.109 (4.109)      Loss
0.9121 (0.9121)    Prec 73.047% (73.047%)
Validation starts
```

```
Test: [0/20]    Time 3.585 (3.585)      Loss 1.1381 (1.1381)    Prec 64.453%
(64.453%)
 * Prec 64.440%
best acc: 65.060000
Epoch: [510][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9648 (0.9648)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.571 (3.571)      Loss 1.1354 (1.1354)    Prec 66.406%
(66.406%)
 * Prec 64.830%
best acc: 65.060000
Epoch: [511][0/98]      Time 4.243 (4.243)      Data 4.140 (4.140)      Loss
1.0070 (1.0070)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.654 (3.654)      Loss 1.1714 (1.1714)    Prec 62.891%
(62.891%)
 * Prec 63.910%
best acc: 65.060000
Epoch: [512][0/98]      Time 4.138 (4.138)      Data 4.117 (4.117)      Loss
0.9918 (0.9918)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.557 (3.557)      Loss 1.1744 (1.1744)    Prec 63.867%
(63.867%)
 * Prec 64.600%
best acc: 65.060000
Epoch: [513][0/98]      Time 4.287 (4.287)      Data 4.183 (4.183)      Loss
0.9659 (0.9659)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.549 (3.549)      Loss 1.1772 (1.1772)    Prec 63.086%
(63.086%)
 * Prec 63.790%
best acc: 65.060000
Epoch: [514][0/98]      Time 4.113 (4.113)      Data 4.089 (4.089)      Loss
0.9566 (0.9566)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.653 (3.653)      Loss 1.1589 (1.1589)    Prec 63.281%
(63.281%)
 * Prec 64.280%
best acc: 65.060000
Epoch: [515][0/98]      Time 4.127 (4.127)      Data 4.105 (4.105)      Loss
0.9526 (0.9526)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1881 (1.1881)    Prec 65.039%
(65.039%)
 * Prec 64.440%
best acc: 65.060000
Epoch: [516][0/98]      Time 4.159 (4.159)      Data 4.136 (4.136)      Loss
0.9674 (0.9674)    Prec 69.141% (69.141%)
```

```
Validation starts
Test: [0/20]    Time 3.552 (3.552)      Loss 1.1831 (1.1831)    Prec 63.086%
(63.086%)
 * Prec 64.600%
best acc: 65.060000
Epoch: [517][0/98]      Time 4.185 (4.185)      Data 4.163 (4.163)      Loss
0.9735 (0.9735)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1768 (1.1768)    Prec 63.477%
(63.477%)
 * Prec 63.860%
best acc: 65.060000
Epoch: [518][0/98]      Time 4.169 (4.169)      Data 4.147 (4.147)      Loss
0.9236 (0.9236)    Prec 73.047% (73.047%)
Validation starts
Test: [0/20]    Time 3.641 (3.641)      Loss 1.1572 (1.1572)    Prec 63.867%
(63.867%)
 * Prec 64.010%
best acc: 65.060000
Epoch: [519][0/98]      Time 4.182 (4.182)      Data 4.160 (4.160)      Loss
0.9722 (0.9722)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.576 (3.576)      Loss 1.1511 (1.1511)    Prec 63.867%
(63.867%)
 * Prec 64.160%
best acc: 65.060000
Epoch: [520][0/98]      Time 4.164 (4.164)      Data 4.142 (4.142)      Loss
0.9623 (0.9623)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.617 (3.617)      Loss 1.1717 (1.1717)    Prec 65.430%
(65.430%)
 * Prec 64.520%
best acc: 65.060000
Epoch: [521][0/98]      Time 4.274 (4.274)      Data 4.171 (4.171)      Loss
0.9796 (0.9796)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.816 (3.816)      Loss 1.1658 (1.1658)    Prec 62.891%
(62.891%)
 * Prec 63.720%
best acc: 65.060000
Epoch: [522][0/98]      Time 4.172 (4.172)      Data 4.149 (4.149)      Loss
0.9365 (0.9365)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1574 (1.1574)    Prec 64.062%
(64.062%)
 * Prec 64.620%
best acc: 65.060000
Epoch: [523][0/98]      Time 4.164 (4.164)      Data 4.143 (4.143)      Loss
```

```
0.9849 (0.9849)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1608 (1.1608)    Prec 64.062%
(64.062%)
 * Prec 64.460%
best acc: 65.060000
Epoch: [524][0/98]      Time 4.206 (4.206)      Data 4.183 (4.183)      Loss
0.9569 (0.9569)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.595 (3.595)      Loss 1.1651 (1.1651)    Prec 64.648%
(64.648%)
 * Prec 64.840%
best acc: 65.060000
Epoch: [525][0/98]      Time 4.147 (4.147)      Data 4.126 (4.126)      Loss
0.9967 (0.9967)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.702 (3.702)      Loss 1.1387 (1.1387)    Prec 64.648%
(64.648%)
 * Prec 64.400%
best acc: 65.060000
Epoch: [526][0/98]      Time 4.156 (4.156)      Data 4.133 (4.133)      Loss
0.9738 (0.9738)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.598 (3.598)      Loss 1.1486 (1.1486)    Prec 63.281%
(63.281%)
 * Prec 64.050%
best acc: 65.060000
Epoch: [527][0/98]      Time 4.228 (4.228)      Data 4.205 (4.205)      Loss
0.9442 (0.9442)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1666 (1.1666)    Prec 65.234%
(65.234%)
 * Prec 64.130%
best acc: 65.060000
Epoch: [528][0/98]      Time 4.174 (4.174)      Data 4.152 (4.152)      Loss
0.9420 (0.9420)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.1546 (1.1546)    Prec 65.430%
(65.430%)
 * Prec 64.570%
best acc: 65.060000
Epoch: [529][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
0.9512 (0.9512)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.592 (3.592)      Loss 1.1699 (1.1699)    Prec 63.477%
(63.477%)
 * Prec 64.010%
best acc: 65.060000
```

```
Epoch: [530][0/98]      Time 4.147 (4.147)      Data 4.125 (4.125)      Loss
0.9321 (0.9321)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1603 (1.1603)    Prec 64.062%
(64.062%)
 * Prec 64.380%
best acc: 65.060000
Epoch: [531][0/98]      Time 4.181 (4.181)      Data 4.157 (4.157)      Loss
0.9568 (0.9568)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.659 (3.659)      Loss 1.1548 (1.1548)    Prec 63.867%
(63.867%)
 * Prec 64.280%
best acc: 65.060000
Epoch: [532][0/98]      Time 4.212 (4.212)      Data 4.190 (4.190)      Loss
0.9993 (0.9993)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.667 (3.667)      Loss 1.1589 (1.1589)    Prec 63.477%
(63.477%)
 * Prec 63.970%
best acc: 65.060000
Epoch: [533][0/98]      Time 4.213 (4.213)      Data 4.187 (4.187)      Loss
0.9965 (0.9965)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.618 (3.618)      Loss 1.1579 (1.1579)    Prec 63.867%
(63.867%)
 * Prec 64.360%
best acc: 65.060000
Epoch: [534][0/98]      Time 4.255 (4.255)      Data 4.154 (4.154)      Loss
0.9178 (0.9178)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.699 (3.699)      Loss 1.1708 (1.1708)    Prec 63.477%
(63.477%)
 * Prec 64.340%
best acc: 65.060000
Epoch: [535][0/98]      Time 4.165 (4.165)      Data 4.144 (4.144)      Loss
0.9406 (0.9406)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.681 (3.681)      Loss 1.1590 (1.1590)    Prec 64.062%
(64.062%)
 * Prec 64.060%
best acc: 65.060000
Epoch: [536][0/98]      Time 4.186 (4.186)      Data 4.164 (4.164)      Loss
0.9561 (0.9561)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.591 (3.591)      Loss 1.1354 (1.1354)    Prec 66.992%
(66.992%)
 * Prec 65.110%
```

```
best acc: 65.110000
Epoch: [537][0/98]      Time 4.209 (4.209)      Data 4.187 (4.187)      Loss
0.9850 (0.9850)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1408 (1.1408)    Prec 66.406%
(66.406%)
 * Prec 64.720%
best acc: 65.110000
Epoch: [538][0/98]      Time 4.196 (4.196)      Data 4.174 (4.174)      Loss
0.9187 (0.9187)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.568 (3.568)      Loss 1.1412 (1.1412)    Prec 66.211%
(66.211%)
 * Prec 64.650%
best acc: 65.110000
Epoch: [539][0/98]      Time 4.197 (4.197)      Data 4.168 (4.168)      Loss
0.9584 (0.9584)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.2142 (1.2142)    Prec 62.305%
(62.305%)
 * Prec 64.060%
best acc: 65.110000
Epoch: [540][0/98]      Time 4.182 (4.182)      Data 4.160 (4.160)      Loss
0.9398 (0.9398)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.590 (3.590)      Loss 1.1540 (1.1540)    Prec 66.016%
(66.016%)
 * Prec 64.750%
best acc: 65.110000
Epoch: [541][0/98]      Time 4.161 (4.161)      Data 4.140 (4.140)      Loss
1.0180 (1.0180)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.679 (3.679)      Loss 1.1539 (1.1539)    Prec 65.625%
(65.625%)
 * Prec 64.760%
best acc: 65.110000
Epoch: [542][0/98]      Time 4.152 (4.152)      Data 4.130 (4.130)      Loss
0.9486 (0.9486)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.659 (3.659)      Loss 1.1824 (1.1824)    Prec 62.695%
(62.695%)
 * Prec 63.910%
best acc: 65.110000
Epoch: [543][0/98]      Time 4.170 (4.170)      Data 4.148 (4.148)      Loss
0.9175 (0.9175)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1693 (1.1693)    Prec 65.430%
(65.430%)
```

```
 * Prec 64.460%
best acc: 65.110000
Epoch: [544][0/98]      Time 4.139 (4.139)      Data 4.116 (4.116)      Loss
0.9467 (0.9467)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.591 (3.591)      Loss 1.1908 (1.1908)    Prec 65.039%
(65.039%)
 * Prec 64.550%
best acc: 65.110000
Epoch: [545][0/98]      Time 4.178 (4.178)      Data 4.156 (4.156)      Loss
0.9508 (0.9508)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1776 (1.1776)    Prec 63.477%
(63.477%)
 * Prec 63.860%
best acc: 65.110000
Epoch: [546][0/98]      Time 4.318 (4.318)      Data 4.214 (4.214)      Loss
0.9534 (0.9534)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1565 (1.1565)    Prec 64.258%
(64.258%)
 * Prec 65.120%
best acc: 65.120000
Epoch: [547][0/98]      Time 4.202 (4.202)      Data 4.180 (4.180)      Loss
0.9445 (0.9445)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.635 (3.635)      Loss 1.1736 (1.1736)    Prec 64.453%
(64.453%)
 * Prec 64.860%
best acc: 65.120000
Epoch: [548][0/98]      Time 4.261 (4.261)      Data 4.159 (4.159)      Loss
0.9871 (0.9871)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.577 (3.577)      Loss 1.1858 (1.1858)    Prec 63.477%
(63.477%)
 * Prec 64.040%
best acc: 65.120000
Epoch: [549][0/98]      Time 4.187 (4.187)      Data 4.165 (4.165)      Loss
0.9895 (0.9895)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1593 (1.1593)    Prec 64.258%
(64.258%)
 * Prec 64.420%
best acc: 65.120000
Epoch: [550][0/98]      Time 4.181 (4.181)      Data 4.159 (4.159)      Loss
0.9253 (0.9253)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.712 (3.712)      Loss 1.1878 (1.1878)    Prec 62.109%
```

```
(62.109%)
 * Prec 64.140%
best acc: 65.120000
Epoch: [551][0/98]      Time 4.194 (4.194)      Data 4.173 (4.173)      Loss
0.9821 (0.9821)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.607 (3.607)      Loss 1.1883 (1.1883)    Prec 63.086%
(63.086%)
 * Prec 63.940%
best acc: 65.120000
Epoch: [552][0/98]      Time 4.128 (4.128)      Data 4.107 (4.107)      Loss
0.9566 (0.9566)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.633 (3.633)      Loss 1.1747 (1.1747)    Prec 65.430%
(65.430%)
 * Prec 64.120%
best acc: 65.120000
Epoch: [553][0/98]      Time 4.172 (4.172)      Data 4.150 (4.150)      Loss
0.9549 (0.9549)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.602 (3.602)      Loss 1.1697 (1.1697)    Prec 65.820%
(65.820%)
 * Prec 64.060%
best acc: 65.120000
Epoch: [554][0/98]      Time 4.152 (4.152)      Data 4.130 (4.130)      Loss
0.9349 (0.9349)    Prec 73.047% (73.047%)
Validation starts
Test: [0/20]    Time 3.628 (3.628)      Loss 1.1584 (1.1584)    Prec 65.820%
(65.820%)
 * Prec 64.410%
best acc: 65.120000
Epoch: [555][0/98]      Time 4.195 (4.195)      Data 4.172 (4.172)      Loss
0.9619 (0.9619)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.1587 (1.1587)    Prec 66.016%
(66.016%)
 * Prec 64.800%
best acc: 65.120000
Epoch: [556][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9724 (0.9724)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1719 (1.1719)    Prec 63.086%
(63.086%)
 * Prec 63.980%
best acc: 65.120000
Epoch: [557][0/98]      Time 4.176 (4.176)      Data 4.153 (4.153)      Loss
0.9377 (0.9377)    Prec 71.094% (71.094%)
Validation starts
```

```
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1545 (1.1545)    Prec 64.062%
(64.062%)
 * Prec 64.020%
best acc: 65.120000
Epoch: [558][0/98]      Time 4.177 (4.177)      Data 4.155 (4.155)      Loss
0.9540 (0.9540)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1448 (1.1448)    Prec 66.211%
(66.211%)
 * Prec 64.620%
best acc: 65.120000
Epoch: [559][0/98]      Time 4.159 (4.159)      Data 4.136 (4.136)      Loss
0.9233 (0.9233)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.637 (3.637)      Loss 1.1617 (1.1617)    Prec 63.281%
(63.281%)
 * Prec 64.140%
best acc: 65.120000
Epoch: [560][0/98]      Time 4.182 (4.182)      Data 4.160 (4.160)      Loss
0.9519 (0.9519)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1740 (1.1740)    Prec 63.477%
(63.477%)
 * Prec 64.800%
best acc: 65.120000
Epoch: [561][0/98]      Time 4.180 (4.180)      Data 4.157 (4.157)      Loss
0.9860 (0.9860)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.693 (3.693)      Loss 1.1553 (1.1553)    Prec 63.867%
(63.867%)
 * Prec 64.140%
best acc: 65.120000
Epoch: [562][0/98]      Time 4.171 (4.171)      Data 4.151 (4.151)      Loss
0.9167 (0.9167)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.634 (3.634)      Loss 1.1426 (1.1426)    Prec 64.258%
(64.258%)
 * Prec 64.170%
best acc: 65.120000
Epoch: [563][0/98]      Time 4.170 (4.170)      Data 4.143 (4.143)      Loss
0.9316 (0.9316)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.631 (3.631)      Loss 1.1498 (1.1498)    Prec 64.258%
(64.258%)
 * Prec 64.970%
best acc: 65.120000
Epoch: [564][0/98]      Time 4.174 (4.174)      Data 4.150 (4.150)      Loss
0.9496 (0.9496)    Prec 69.141% (69.141%)
```

```
Validation starts
Test: [0/20]    Time 3.584 (3.584)      Loss 1.1526 (1.1526)    Prec 64.453%
(64.453%)
 * Prec 64.800%
best acc: 65.120000
Epoch: [565][0/98]      Time 4.171 (4.171)      Data 4.149 (4.149)      Loss
1.0237 (1.0237)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.615 (3.615)      Loss 1.1711 (1.1711)    Prec 65.625%
(65.625%)
 * Prec 64.170%
best acc: 65.120000
Epoch: [566][0/98]      Time 4.157 (4.157)      Data 4.135 (4.135)      Loss
0.9381 (0.9381)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.598 (3.598)      Loss 1.1474 (1.1474)    Prec 66.016%
(66.016%)
 * Prec 64.640%
best acc: 65.120000
Epoch: [567][0/98]      Time 4.158 (4.158)      Data 4.137 (4.137)      Loss
0.9942 (0.9942)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.643 (3.643)      Loss 1.1384 (1.1384)    Prec 65.039%
(65.039%)
 * Prec 64.950%
best acc: 65.120000
Epoch: [568][0/98]      Time 4.157 (4.157)      Data 4.134 (4.134)      Loss
0.9838 (0.9838)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.619 (3.619)      Loss 1.1465 (1.1465)    Prec 66.406%
(66.406%)
 * Prec 64.370%
best acc: 65.120000
Epoch: [569][0/98]      Time 4.168 (4.168)      Data 4.146 (4.146)      Loss
0.9869 (0.9869)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.676 (3.676)      Loss 1.1570 (1.1570)    Prec 64.844%
(64.844%)
 * Prec 64.750%
best acc: 65.120000
Epoch: [570][0/98]      Time 4.335 (4.335)      Data 4.231 (4.231)      Loss
0.9766 (0.9766)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1570 (1.1570)    Prec 63.867%
(63.867%)
 * Prec 64.290%
best acc: 65.120000
Epoch: [571][0/98]      Time 4.145 (4.145)      Data 4.123 (4.123)      Loss
```

```
0.9603 (0.9603)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.631 (3.631)      Loss 1.1880 (1.1880)    Prec 63.477%
(63.477%)
 * Prec 63.950%
best acc: 65.120000
Epoch: [572][0/98]      Time 4.162 (4.162)      Data 4.140 (4.140)      Loss
0.9407 (0.9407)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.615 (3.615)      Loss 1.1647 (1.1647)    Prec 64.258%
(64.258%)
 * Prec 64.860%
best acc: 65.120000
Epoch: [573][0/98]      Time 4.178 (4.178)      Data 4.157 (4.157)      Loss
0.9480 (0.9480)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.684 (3.684)      Loss 1.1791 (1.1791)    Prec 64.453%
(64.453%)
 * Prec 64.450%
best acc: 65.120000
Epoch: [574][0/98]      Time 4.154 (4.154)      Data 4.132 (4.132)      Loss
0.9387 (0.9387)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.718 (3.718)      Loss 1.1417 (1.1417)    Prec 63.672%
(63.672%)
 * Prec 64.010%
best acc: 65.120000
Epoch: [575][0/98]      Time 4.151 (4.151)      Data 4.128 (4.128)      Loss
0.9505 (0.9505)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.621 (3.621)      Loss 1.2032 (1.2032)    Prec 62.695%
(62.695%)
 * Prec 64.110%
best acc: 65.120000
Epoch: [576][0/98]      Time 4.146 (4.146)      Data 4.121 (4.121)      Loss
0.9741 (0.9741)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.664 (3.664)      Loss 1.1684 (1.1684)    Prec 64.062%
(64.062%)
 * Prec 64.820%
best acc: 65.120000
Epoch: [577][0/98]      Time 4.156 (4.156)      Data 4.132 (4.132)      Loss
0.9456 (0.9456)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.610 (3.610)      Loss 1.1551 (1.1551)    Prec 65.625%
(65.625%)
 * Prec 64.690%
best acc: 65.120000
```

```
Epoch: [578][0/98]      Time 4.294 (4.294)      Data 4.272 (4.272)      Loss
0.9562 (0.9562)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.596 (3.596)      Loss 1.1670 (1.1670)    Prec 64.062%
(64.062%)
 * Prec 64.460%
best acc: 65.120000
Epoch: [579][0/98]      Time 4.171 (4.171)      Data 4.149 (4.149)      Loss
0.9522 (0.9522)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1440 (1.1440)    Prec 64.453%
(64.453%)
 * Prec 64.550%
best acc: 65.120000
Epoch: [580][0/98]      Time 4.170 (4.170)      Data 4.148 (4.148)      Loss
0.9539 (0.9539)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1536 (1.1536)    Prec 64.062%
(64.062%)
 * Prec 64.440%
best acc: 65.120000
Epoch: [581][0/98]      Time 4.157 (4.157)      Data 4.133 (4.133)      Loss
0.9805 (0.9805)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.670 (3.670)      Loss 1.1234 (1.1234)    Prec 65.039%
(65.039%)
 * Prec 64.920%
best acc: 65.120000
Epoch: [582][0/98]      Time 4.175 (4.175)      Data 4.153 (4.153)      Loss
0.9686 (0.9686)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.591 (3.591)      Loss 1.1500 (1.1500)    Prec 64.844%
(64.844%)
 * Prec 64.800%
best acc: 65.120000
Epoch: [583][0/98]      Time 4.265 (4.265)      Data 4.168 (4.168)      Loss
0.9927 (0.9927)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.728 (3.728)      Loss 1.1532 (1.1532)    Prec 63.867%
(63.867%)
 * Prec 64.110%
best acc: 65.120000
Epoch: [584][0/98]      Time 4.191 (4.191)      Data 4.168 (4.168)      Loss
0.9325 (0.9325)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.762 (3.762)      Loss 1.1181 (1.1181)    Prec 64.844%
(64.844%)
 * Prec 65.120%
```

```
best acc: 65.120000
Epoch: [585][0/98]      Time 4.297 (4.297)      Data 4.274 (4.274)      Loss
0.9531 (0.9531)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1456 (1.1456)    Prec 66.406%
(66.406%)
 * Prec 64.500%
best acc: 65.120000
Epoch: [586][0/98]      Time 4.171 (4.171)      Data 4.148 (4.148)      Loss
0.9292 (0.9292)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.616 (3.616)      Loss 1.1549 (1.1549)    Prec 64.062%
(64.062%)
 * Prec 64.780%
best acc: 65.120000
Epoch: [587][0/98]      Time 4.184 (4.184)      Data 4.163 (4.163)      Loss
0.9737 (0.9737)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.1848 (1.1848)    Prec 63.867%
(63.867%)
 * Prec 64.500%
best acc: 65.120000
Epoch: [588][0/98]      Time 4.297 (4.297)      Data 4.195 (4.195)      Loss
0.9267 (0.9267)    Prec 74.023% (74.023%)
Validation starts
Test: [0/20]    Time 3.601 (3.601)      Loss 1.1630 (1.1630)    Prec 63.672%
(63.672%)
 * Prec 64.940%
best acc: 65.120000
Epoch: [589][0/98]      Time 4.245 (4.245)      Data 4.141 (4.141)      Loss
0.9716 (0.9716)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.587 (3.587)      Loss 1.1502 (1.1502)    Prec 64.453%
(64.453%)
 * Prec 64.850%
best acc: 65.120000
Epoch: [590][0/98]      Time 4.199 (4.199)      Data 4.177 (4.177)      Loss
0.9516 (0.9516)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.600 (3.600)      Loss 1.1605 (1.1605)    Prec 65.234%
(65.234%)
 * Prec 64.450%
best acc: 65.120000
Epoch: [591][0/98]      Time 4.176 (4.176)      Data 4.155 (4.155)      Loss
0.9704 (0.9704)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.667 (3.667)      Loss 1.1485 (1.1485)    Prec 65.039%
(65.039%)
```

```
 * Prec 64.800%
best acc: 65.120000
Epoch: [592][0/98]      Time 4.176 (4.176)      Data 4.153 (4.153)      Loss
0.9702 (0.9702)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.659 (3.659)      Loss 1.1316 (1.1316)    Prec 64.062%
(64.062%)
 * Prec 64.790%
best acc: 65.120000
Epoch: [593][0/98]      Time 4.195 (4.195)      Data 4.171 (4.171)      Loss
1.0056 (1.0056)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.595 (3.595)      Loss 1.1716 (1.1716)    Prec 63.281%
(63.281%)
 * Prec 64.590%
best acc: 65.120000
Epoch: [594][0/98]      Time 4.171 (4.171)      Data 4.149 (4.149)      Loss
0.9478 (0.9478)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.607 (3.607)      Loss 1.1375 (1.1375)    Prec 63.867%
(63.867%)
 * Prec 64.790%
best acc: 65.120000
Epoch: [595][0/98]      Time 4.179 (4.179)      Data 4.157 (4.157)      Loss
0.9634 (0.9634)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.626 (3.626)      Loss 1.1370 (1.1370)    Prec 64.453%
(64.453%)
 * Prec 64.880%
best acc: 65.120000
Epoch: [596][0/98]      Time 4.197 (4.197)      Data 4.175 (4.175)      Loss
1.0137 (1.0137)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.617 (3.617)      Loss 1.1564 (1.1564)    Prec 63.477%
(63.477%)
 * Prec 64.300%
best acc: 65.120000
Epoch: [597][0/98]      Time 4.195 (4.195)      Data 4.174 (4.174)      Loss
0.9587 (0.9587)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.602 (3.602)      Loss 1.1310 (1.1310)    Prec 64.648%
(64.648%)
 * Prec 64.310%
best acc: 65.120000
Epoch: [598][0/98]      Time 4.206 (4.206)      Data 4.183 (4.183)      Loss
0.9249 (0.9249)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1509 (1.1509)    Prec 63.867%
```

```
(63.867%)
 * Prec 64.080%
best acc: 65.120000
Epoch: [599][0/98]      Time 4.171 (4.171)      Data 4.148 (4.148)      Loss
0.9746 (0.9746)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.609 (3.609)      Loss 1.1488 (1.1488)    Prec 64.844%
(64.844%)
 * Prec 64.580%
best acc: 65.120000
Epoch: [600][0/98]      Time 4.296 (4.296)      Data 4.190 (4.190)      Loss
0.9641 (0.9641)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.1439 (1.1439)    Prec 66.602%
(66.602%)
 * Prec 64.180%
best acc: 65.120000
Epoch: [601][0/98]      Time 4.162 (4.162)      Data 4.140 (4.140)      Loss
1.0197 (1.0197)    Prec 66.211% (66.211%)
Validation starts
Test: [0/20]    Time 3.801 (3.801)      Loss 1.1500 (1.1500)    Prec 64.258%
(64.258%)
 * Prec 64.450%
best acc: 65.120000
Epoch: [602][0/98]      Time 4.141 (4.141)      Data 4.120 (4.120)      Loss
1.0125 (1.0125)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.639 (3.639)      Loss 1.1135 (1.1135)    Prec 67.188%
(67.188%)
 * Prec 64.780%
best acc: 65.120000
Epoch: [603][0/98]      Time 4.199 (4.199)      Data 4.176 (4.176)      Loss
0.9404 (0.9404)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.610 (3.610)      Loss 1.1225 (1.1225)    Prec 65.039%
(65.039%)
 * Prec 64.260%
best acc: 65.120000
Epoch: [604][0/98]      Time 4.164 (4.164)      Data 4.143 (4.143)      Loss
0.9342 (0.9342)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.691 (3.691)      Loss 1.1259 (1.1259)    Prec 65.039%
(65.039%)
 * Prec 64.700%
best acc: 65.120000
Epoch: [605][0/98]      Time 4.180 (4.180)      Data 4.158 (4.158)      Loss
1.0146 (1.0146)    Prec 64.648% (64.648%)
Validation starts
```

```
Test: [0/20]    Time 3.589 (3.589)      Loss 1.1362 (1.1362)    Prec 65.430%
(65.430%)
 * Prec 64.800%
best acc: 65.120000
Epoch: [606][0/98]      Time 4.200 (4.200)      Data 4.176 (4.176)      Loss
0.9784 (0.9784)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.648 (3.648)      Loss 1.1290 (1.1290)    Prec 64.648%
(64.648%)
 * Prec 64.840%
best acc: 65.120000
Epoch: [607][0/98]      Time 4.229 (4.229)      Data 4.206 (4.206)      Loss
0.9251 (0.9251)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.613 (3.613)      Loss 1.1475 (1.1475)    Prec 64.453%
(64.453%)
 * Prec 64.770%
best acc: 65.120000
Epoch: [608][0/98]      Time 4.275 (4.275)      Data 4.173 (4.173)      Loss
0.9228 (0.9228)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.563 (3.563)      Loss 1.1458 (1.1458)    Prec 64.258%
(64.258%)
 * Prec 63.930%
best acc: 65.120000
Epoch: [609][0/98]      Time 4.311 (4.311)      Data 4.208 (4.208)      Loss
1.0004 (1.0004)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.688 (3.688)      Loss 1.1697 (1.1697)    Prec 65.039%
(65.039%)
 * Prec 64.670%
best acc: 65.120000
Epoch: [610][0/98]      Time 4.160 (4.160)      Data 4.139 (4.139)      Loss
0.9650 (0.9650)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.579 (3.579)      Loss 1.1467 (1.1467)    Prec 65.039%
(65.039%)
 * Prec 64.810%
best acc: 65.120000
Epoch: [611][0/98]      Time 4.137 (4.137)      Data 4.115 (4.115)      Loss
0.9972 (0.9972)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.723 (3.723)      Loss 1.1319 (1.1319)    Prec 64.453%
(64.453%)
 * Prec 64.220%
best acc: 65.120000
Epoch: [612][0/98]      Time 4.185 (4.185)      Data 4.158 (4.158)      Loss
0.9071 (0.9071)    Prec 71.484% (71.484%)
```

```
Validation starts
Test: [0/20]    Time 3.614 (3.614)      Loss 1.1529 (1.1529)    Prec 65.430%
(65.430%)
 * Prec 64.450%
best acc: 65.120000
Epoch: [613][0/98]      Time 4.197 (4.197)      Data 4.173 (4.173)      Loss
0.9620 (0.9620)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.601 (3.601)      Loss 1.1474 (1.1474)    Prec 64.844%
(64.844%)
 * Prec 64.710%
best acc: 65.120000
Epoch: [614][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9634 (0.9634)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.629 (3.629)      Loss 1.1381 (1.1381)    Prec 64.258%
(64.258%)
 * Prec 64.260%
best acc: 65.120000
Epoch: [615][0/98]      Time 4.225 (4.225)      Data 4.202 (4.202)      Loss
0.9659 (0.9659)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.610 (3.610)      Loss 1.1427 (1.1427)    Prec 64.453%
(64.453%)
 * Prec 64.780%
best acc: 65.120000
Epoch: [616][0/98]      Time 4.149 (4.149)      Data 4.127 (4.127)      Loss
0.9475 (0.9475)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1616 (1.1616)    Prec 66.211%
(66.211%)
 * Prec 64.170%
best acc: 65.120000
Epoch: [617][0/98]      Time 4.129 (4.129)      Data 4.108 (4.108)      Loss
0.9572 (0.9572)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.608 (3.608)      Loss 1.1347 (1.1347)    Prec 64.258%
(64.258%)
 * Prec 64.520%
best acc: 65.120000
Epoch: [618][0/98]      Time 4.166 (4.166)      Data 4.142 (4.142)      Loss
0.9745 (0.9745)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.613 (3.613)      Loss 1.1710 (1.1710)    Prec 63.281%
(63.281%)
 * Prec 64.190%
best acc: 65.120000
Epoch: [619][0/98]      Time 4.165 (4.165)      Data 4.145 (4.145)      Loss
```

```
0.9185 (0.9185)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.620 (3.620)      Loss 1.1258 (1.1258)    Prec 64.648%
(64.648%)
 * Prec 64.580%
best acc: 65.120000
Epoch: [620][0/98]      Time 4.170 (4.170)      Data 4.148 (4.148)      Loss
0.9330 (0.9330)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1479 (1.1479)    Prec 64.062%
(64.062%)
 * Prec 64.190%
best acc: 65.120000
Epoch: [621][0/98]      Time 4.136 (4.136)      Data 4.112 (4.112)      Loss
0.9457 (0.9457)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.638 (3.638)      Loss 1.1330 (1.1330)    Prec 64.648%
(64.648%)
 * Prec 64.050%
best acc: 65.120000
Epoch: [622][0/98]      Time 4.147 (4.147)      Data 4.125 (4.125)      Loss
1.0363 (1.0363)    Prec 64.453% (64.453%)
Validation starts
Test: [0/20]    Time 3.606 (3.606)      Loss 1.1428 (1.1428)    Prec 65.820%
(65.820%)
 * Prec 64.480%
best acc: 65.120000
Epoch: [623][0/98]      Time 4.176 (4.176)      Data 4.154 (4.154)      Loss
0.9427 (0.9427)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.703 (3.703)      Loss 1.1291 (1.1291)    Prec 64.062%
(64.062%)
 * Prec 64.400%
best acc: 65.120000
Epoch: [624][0/98]      Time 4.170 (4.170)      Data 4.149 (4.149)      Loss
0.9263 (0.9263)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.675 (3.675)      Loss 1.1458 (1.1458)    Prec 65.430%
(65.430%)
 * Prec 64.230%
best acc: 65.120000
Epoch: [625][0/98]      Time 4.275 (4.275)      Data 4.171 (4.171)      Loss
0.9878 (0.9878)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.691 (3.691)      Loss 1.1448 (1.1448)    Prec 64.062%
(64.062%)
 * Prec 64.700%
best acc: 65.120000
```

```
Epoch: [626][0/98]      Time 4.149 (4.149)      Data 4.128 (4.128)      Loss
0.9727 (0.9727)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1526 (1.1526)    Prec 65.625%
(65.625%)
 * Prec 64.020%
best acc: 65.120000
Epoch: [627][0/98]      Time 4.179 (4.179)      Data 4.157 (4.157)      Loss
0.9668 (0.9668)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.584 (3.584)      Loss 1.1416 (1.1416)    Prec 64.453%
(64.453%)
 * Prec 64.590%
best acc: 65.120000
Epoch: [628][0/98]      Time 4.175 (4.175)      Data 4.153 (4.153)      Loss
1.0253 (1.0253)    Prec 65.625% (65.625%)
Validation starts
Test: [0/20]    Time 3.576 (3.576)      Loss 1.1377 (1.1377)    Prec 63.867%
(63.867%)
 * Prec 64.410%
best acc: 65.120000
Epoch: [629][0/98]      Time 4.169 (4.169)      Data 4.147 (4.147)      Loss
0.9226 (0.9226)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.520 (3.520)      Loss 1.1288 (1.1288)    Prec 64.453%
(64.453%)
 * Prec 64.240%
best acc: 65.120000
Epoch: [630][0/98]      Time 4.208 (4.208)      Data 4.186 (4.186)      Loss
0.9786 (0.9786)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.581 (3.581)      Loss 1.1494 (1.1494)    Prec 63.672%
(63.672%)
 * Prec 63.990%
best acc: 65.120000
Epoch: [631][0/98]      Time 4.139 (4.139)      Data 4.116 (4.116)      Loss
0.9634 (0.9634)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.541 (3.541)      Loss 1.1428 (1.1428)    Prec 66.602%
(66.602%)
 * Prec 64.550%
best acc: 65.120000
Epoch: [632][0/98]      Time 4.189 (4.189)      Data 4.166 (4.166)      Loss
0.9082 (0.9082)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.529 (3.529)      Loss 1.1433 (1.1433)    Prec 63.867%
(63.867%)
 * Prec 64.250%
```

```
best acc: 65.120000
Epoch: [633][0/98]      Time 4.193 (4.193)      Data 4.093 (4.093)      Loss
0.9324 (0.9324)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.520 (3.520)      Loss 1.1534 (1.1534)    Prec 63.867%
(63.867%)
 * Prec 64.180%
best acc: 65.120000
Epoch: [634][0/98]      Time 4.120 (4.120)      Data 4.099 (4.099)      Loss
0.9609 (0.9609)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.592 (3.592)      Loss 1.1374 (1.1374)    Prec 66.602%
(66.602%)
 * Prec 64.780%
best acc: 65.120000
Epoch: [635][0/98]      Time 4.160 (4.160)      Data 4.138 (4.138)      Loss
0.9496 (0.9496)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.536 (3.536)      Loss 1.1495 (1.1495)    Prec 63.867%
(63.867%)
 * Prec 64.050%
best acc: 65.120000
Epoch: [636][0/98]      Time 4.140 (4.140)      Data 4.118 (4.118)      Loss
0.9780 (0.9780)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.636 (3.636)      Loss 1.1308 (1.1308)    Prec 66.992%
(66.992%)
 * Prec 64.390%
best acc: 65.120000
Epoch: [637][0/98]      Time 4.138 (4.138)      Data 4.117 (4.117)      Loss
0.9570 (0.9570)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.505 (3.505)      Loss 1.1391 (1.1391)    Prec 64.258%
(64.258%)
 * Prec 64.220%
best acc: 65.120000
Epoch: [638][0/98]      Time 4.153 (4.153)      Data 4.132 (4.132)      Loss
0.9504 (0.9504)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1418 (1.1418)    Prec 64.453%
(64.453%)
 * Prec 64.760%
best acc: 65.120000
Epoch: [639][0/98]      Time 4.116 (4.116)      Data 4.094 (4.094)      Loss
0.9818 (0.9818)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.533 (3.533)      Loss 1.1247 (1.1247)    Prec 66.602%
(66.602%)
```

```
 * Prec 64.590%
best acc: 65.120000
Epoch: [640][0/98]      Time 4.135 (4.135)      Data 4.114 (4.114)      Loss
0.9514 (0.9514)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.605 (3.605)      Loss 1.1463 (1.1463)    Prec 64.844%
(64.844%)
 * Prec 64.730%
best acc: 65.120000
Epoch: [641][0/98]      Time 4.104 (4.104)      Data 4.083 (4.083)      Loss
0.9238 (0.9238)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.525 (3.525)      Loss 1.1493 (1.1493)    Prec 66.602%
(66.602%)
 * Prec 64.670%
best acc: 65.120000
Epoch: [642][0/98]      Time 4.141 (4.141)      Data 4.119 (4.119)      Loss
0.9517 (0.9517)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.540 (3.540)      Loss 1.1415 (1.1415)    Prec 64.453%
(64.453%)
 * Prec 64.260%
best acc: 65.120000
Epoch: [643][0/98]      Time 4.103 (4.103)      Data 4.081 (4.081)      Loss
0.9755 (0.9755)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.513 (3.513)      Loss 1.1807 (1.1807)    Prec 65.625%
(65.625%)
 * Prec 64.440%
best acc: 65.120000
Epoch: [644][0/98]      Time 4.124 (4.124)      Data 4.102 (4.102)      Loss
0.9923 (0.9923)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.561 (3.561)      Loss 1.1690 (1.1690)    Prec 63.867%
(63.867%)
 * Prec 65.180%
best acc: 65.180000
Epoch: [645][0/98]      Time 4.213 (4.213)      Data 4.113 (4.113)      Loss
0.9805 (0.9805)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.553 (3.553)      Loss 1.1622 (1.1622)    Prec 64.062%
(64.062%)
 * Prec 64.360%
best acc: 65.180000
Epoch: [646][0/98]      Time 4.112 (4.112)      Data 4.089 (4.089)      Loss
0.9537 (0.9537)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.521 (3.521)      Loss 1.1510 (1.1510)    Prec 63.867%
```

```
(63.867%)
 * Prec 64.260%
best acc: 65.180000
Epoch: [647][0/98]      Time 4.126 (4.126)      Data 4.103 (4.103)      Loss
0.9378 (0.9378)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.538 (3.538)      Loss 1.1685 (1.1685)    Prec 63.477%
(63.477%)
 * Prec 64.790%
best acc: 65.180000
Epoch: [648][0/98]      Time 4.127 (4.127)      Data 4.107 (4.107)      Loss
0.9316 (0.9316)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1730 (1.1730)    Prec 63.281%
(63.281%)
 * Prec 64.210%
best acc: 65.180000
Epoch: [649][0/98]      Time 4.123 (4.123)      Data 4.100 (4.100)      Loss
0.9469 (0.9469)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1504 (1.1504)    Prec 64.258%
(64.258%)
 * Prec 64.190%
best acc: 65.180000
Epoch: [650][0/98]      Time 4.136 (4.136)      Data 4.114 (4.114)      Loss
0.9452 (0.9452)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.572 (3.572)      Loss 1.1560 (1.1560)    Prec 66.406%
(66.406%)
 * Prec 64.900%
best acc: 65.180000
Epoch: [651][0/98]      Time 4.214 (4.214)      Data 4.193 (4.193)      Loss
0.9625 (0.9625)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.559 (3.559)      Loss 1.1536 (1.1536)    Prec 66.211%
(66.211%)
 * Prec 64.490%
best acc: 65.180000
Epoch: [652][0/98]      Time 4.136 (4.136)      Data 4.116 (4.116)      Loss
0.9548 (0.9548)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.646 (3.646)      Loss 1.1314 (1.1314)    Prec 64.453%
(64.453%)
 * Prec 64.300%
best acc: 65.180000
Epoch: [653][0/98]      Time 4.139 (4.139)      Data 4.115 (4.115)      Loss
0.9206 (0.9206)    Prec 73.242% (73.242%)
Validation starts
```

```
Test: [0/20]    Time 3.565 (3.565)      Loss 1.1389 (1.1389)    Prec 64.258%
(64.258%)
 * Prec 64.810%
best acc: 65.180000
Epoch: [654][0/98]      Time 4.169 (4.169)      Data 4.145 (4.145)      Loss
0.9162 (0.9162)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.583 (3.583)      Loss 1.1365 (1.1365)    Prec 64.062%
(64.062%)
 * Prec 64.080%
best acc: 65.180000
Epoch: [655][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9536 (0.9536)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1349 (1.1349)    Prec 64.844%
(64.844%)
 * Prec 64.750%
best acc: 65.180000
Epoch: [656][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9629 (0.9629)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.601 (3.601)      Loss 1.1528 (1.1528)    Prec 63.672%
(63.672%)
 * Prec 64.480%
best acc: 65.180000
Epoch: [657][0/98]      Time 4.138 (4.138)      Data 4.116 (4.116)      Loss
0.9562 (0.9562)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.598 (3.598)      Loss 1.1357 (1.1357)    Prec 64.453%
(64.453%)
 * Prec 64.820%
best acc: 65.180000
Epoch: [658][0/98]      Time 4.220 (4.220)      Data 4.119 (4.119)      Loss
0.9603 (0.9603)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.788 (3.788)      Loss 1.1335 (1.1335)    Prec 64.453%
(64.453%)
 * Prec 64.190%
best acc: 65.180000
Epoch: [659][0/98]      Time 4.141 (4.141)      Data 4.119 (4.119)      Loss
0.9775 (0.9775)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.930 (3.930)      Loss 1.1335 (1.1335)    Prec 64.844%
(64.844%)
 * Prec 64.690%
best acc: 65.180000
Epoch: [660][0/98]      Time 7.043 (7.043)      Data 6.918 (6.918)      Loss
0.9454 (0.9454)    Prec 71.484% (71.484%)
```

```
Validation starts
Test: [0/20]    Time 3.504 (3.504)      Loss 1.1542 (1.1542)    Prec 64.453%
(64.453%)
 * Prec 64.830%
best acc: 65.180000
Epoch: [661][0/98]      Time 4.098 (4.098)      Data 4.076 (4.076)      Loss
0.9515 (0.9515)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1668 (1.1668)    Prec 63.672%
(63.672%)
 * Prec 64.600%
best acc: 65.180000
Epoch: [662][0/98]      Time 4.088 (4.088)      Data 4.066 (4.066)      Loss
0.9443 (0.9443)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.519 (3.519)      Loss 1.1479 (1.1479)    Prec 66.406%
(66.406%)
 * Prec 64.740%
best acc: 65.180000
Epoch: [663][0/98]      Time 4.080 (4.080)      Data 4.058 (4.058)      Loss
0.9959 (0.9959)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.575 (3.575)      Loss 1.1379 (1.1379)    Prec 66.602%
(66.602%)
 * Prec 64.750%
best acc: 65.180000
Epoch: [664][0/98]      Time 4.132 (4.132)      Data 4.111 (4.111)      Loss
0.9564 (0.9564)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.517 (3.517)      Loss 1.1755 (1.1755)    Prec 64.062%
(64.062%)
 * Prec 64.650%
best acc: 65.180000
Epoch: [665][0/98]      Time 4.107 (4.107)      Data 4.085 (4.085)      Loss
0.9787 (0.9787)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.506 (3.506)      Loss 1.1653 (1.1653)    Prec 64.062%
(64.062%)
 * Prec 64.940%
best acc: 65.180000
Epoch: [666][0/98]      Time 4.101 (4.101)      Data 4.079 (4.079)      Loss
0.9710 (0.9710)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.481 (3.481)      Loss 1.1475 (1.1475)    Prec 66.016%
(66.016%)
 * Prec 64.360%
best acc: 65.180000
Epoch: [667][0/98]      Time 4.070 (4.070)      Data 4.048 (4.048)      Loss
```

```
0.9709 (0.9709)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.487 (3.487)      Loss 1.1622 (1.1622)    Prec 63.477%
(63.477%)
 * Prec 64.250%
best acc: 65.180000
Epoch: [668][0/98]      Time 4.074 (4.074)      Data 4.052 (4.052)      Loss
0.9946 (0.9946)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.483 (3.483)      Loss 1.1570 (1.1570)    Prec 64.648%
(64.648%)
 * Prec 64.860%
best acc: 65.180000
Epoch: [669][0/98]      Time 4.124 (4.124)      Data 4.101 (4.101)      Loss
0.9197 (0.9197)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.487 (3.487)      Loss 1.1532 (1.1532)    Prec 66.406%
(66.406%)
 * Prec 64.450%
best acc: 65.180000
Epoch: [670][0/98]      Time 4.064 (4.064)      Data 4.039 (4.039)      Loss
0.9505 (0.9505)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.503 (3.503)      Loss 1.1395 (1.1395)    Prec 66.602%
(66.602%)
 * Prec 64.760%
best acc: 65.180000
Epoch: [671][0/98]      Time 4.053 (4.053)      Data 4.032 (4.032)      Loss
0.9918 (0.9918)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.501 (3.501)      Loss 1.1632 (1.1632)    Prec 66.211%
(66.211%)
 * Prec 64.720%
best acc: 65.180000
Epoch: [672][0/98]      Time 4.051 (4.051)      Data 4.028 (4.028)      Loss
0.9561 (0.9561)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.513 (3.513)      Loss 1.1440 (1.1440)    Prec 67.188%
(67.188%)
 * Prec 64.960%
best acc: 65.180000
Epoch: [673][0/98]      Time 4.033 (4.033)      Data 4.009 (4.009)      Loss
0.9229 (0.9229)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.488 (3.488)      Loss 1.1767 (1.1767)    Prec 64.062%
(64.062%)
 * Prec 64.660%
best acc: 65.180000
```

```
Epoch: [674][0/98]      Time 4.190 (4.190)      Data 4.085 (4.085)      Loss
0.8962 (0.8962)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1389 (1.1389)    Prec 66.992%
(66.992%)
 * Prec 64.710%
best acc: 65.180000
Epoch: [675][0/98]      Time 4.054 (4.054)      Data 4.032 (4.032)      Loss
0.9625 (0.9625)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.498 (3.498)      Loss 1.1494 (1.1494)    Prec 63.672%
(63.672%)
 * Prec 64.110%
best acc: 65.180000
Epoch: [676][0/98]      Time 4.082 (4.082)      Data 4.060 (4.060)      Loss
0.9226 (0.9226)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.514 (3.514)      Loss 1.1553 (1.1553)    Prec 64.062%
(64.062%)
 * Prec 64.270%
best acc: 65.180000
Epoch: [677][0/98]      Time 4.072 (4.072)      Data 4.051 (4.051)      Loss
1.0197 (1.0197)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.507 (3.507)      Loss 1.1724 (1.1724)    Prec 64.453%
(64.453%)
 * Prec 64.680%
best acc: 65.180000
Epoch: [678][0/98]      Time 4.039 (4.039)      Data 4.016 (4.016)      Loss
0.9261 (0.9261)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.517 (3.517)      Loss 1.1857 (1.1857)    Prec 64.844%
(64.844%)
 * Prec 64.440%
best acc: 65.180000
Epoch: [679][0/98]      Time 4.045 (4.045)      Data 4.025 (4.025)      Loss
0.9419 (0.9419)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.546 (3.546)      Loss 1.1563 (1.1563)    Prec 64.453%
(64.453%)
 * Prec 64.740%
best acc: 65.180000
Epoch: [680][0/98]      Time 4.190 (4.190)      Data 4.168 (4.168)      Loss
0.9369 (0.9369)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.512 (3.512)      Loss 1.1530 (1.1530)    Prec 65.039%
(65.039%)
 * Prec 64.610%
```

```
best acc: 65.180000
Epoch: [681][0/98]      Time 4.168 (4.168)      Data 4.145 (4.145)      Loss
0.9314 (0.9314)    Prec 73.828% (73.828%)
Validation starts
Test: [0/20]    Time 3.505 (3.505)      Loss 1.1308 (1.1308)    Prec 65.039%
(65.039%)
 * Prec 64.620%
best acc: 65.180000
Epoch: [682][0/98]      Time 4.112 (4.112)      Data 4.090 (4.090)      Loss
0.9958 (0.9958)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.507 (3.507)      Loss 1.1522 (1.1522)    Prec 65.039%
(65.039%)
 * Prec 64.660%
best acc: 65.180000
Epoch: [683][0/98]      Time 4.059 (4.059)      Data 4.036 (4.036)      Loss
0.9370 (0.9370)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.496 (3.496)      Loss 1.1442 (1.1442)    Prec 65.234%
(65.234%)
 * Prec 65.170%
best acc: 65.180000
Epoch: [684][0/98]      Time 4.088 (4.088)      Data 4.068 (4.068)      Loss
0.9816 (0.9816)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.497 (3.497)      Loss 1.1284 (1.1284)    Prec 64.844%
(64.844%)
 * Prec 65.070%
best acc: 65.180000
Epoch: [685][0/98]      Time 4.074 (4.074)      Data 4.052 (4.052)      Loss
0.9047 (0.9047)    Prec 73.047% (73.047%)
Validation starts
Test: [0/20]    Time 3.466 (3.466)      Loss 1.1446 (1.1446)    Prec 64.258%
(64.258%)
 * Prec 64.380%
best acc: 65.180000
Epoch: [686][0/98]      Time 4.056 (4.056)      Data 4.034 (4.034)      Loss
0.9469 (0.9469)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.504 (3.504)      Loss 1.1645 (1.1645)    Prec 65.625%
(65.625%)
 * Prec 64.780%
best acc: 65.180000
Epoch: [687][0/98]      Time 4.064 (4.064)      Data 4.043 (4.043)      Loss
0.9330 (0.9330)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.495 (3.495)      Loss 1.1362 (1.1362)    Prec 66.797%
(66.797%)
```

```
 * Prec 64.690%
best acc: 65.180000
Epoch: [688][0/98]      Time 4.041 (4.041)      Data 4.019 (4.019)      Loss
0.9580 (0.9580)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1730 (1.1730)    Prec 64.062%
(64.062%)
 * Prec 64.820%
best acc: 65.180000
Epoch: [689][0/98]      Time 4.057 (4.057)      Data 4.036 (4.036)      Loss
0.9582 (0.9582)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.515 (3.515)      Loss 1.1488 (1.1488)    Prec 64.062%
(64.062%)
 * Prec 64.040%
best acc: 65.180000
Epoch: [690][0/98]      Time 4.030 (4.030)      Data 4.008 (4.008)      Loss
0.9680 (0.9680)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.503 (3.503)      Loss 1.1375 (1.1375)    Prec 65.430%
(65.430%)
 * Prec 64.750%
best acc: 65.180000
Epoch: [691][0/98]      Time 4.152 (4.152)      Data 4.130 (4.130)      Loss
0.9890 (0.9890)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.498 (3.498)      Loss 1.1430 (1.1430)    Prec 64.453%
(64.453%)
 * Prec 64.110%
best acc: 65.180000
Epoch: [692][0/98]      Time 4.068 (4.068)      Data 4.045 (4.045)      Loss
0.9758 (0.9758)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.504 (3.504)      Loss 1.1419 (1.1419)    Prec 65.039%
(65.039%)
 * Prec 64.710%
best acc: 65.180000
Epoch: [693][0/98]      Time 4.061 (4.061)      Data 4.039 (4.039)      Loss
0.9558 (0.9558)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.567 (3.567)      Loss 1.1642 (1.1642)    Prec 64.453%
(64.453%)
 * Prec 64.750%
best acc: 65.180000
Epoch: [694][0/98]      Time 4.107 (4.107)      Data 4.086 (4.086)      Loss
0.9581 (0.9581)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.573 (3.573)      Loss 1.1758 (1.1758)    Prec 63.867%
```

```
(63.867%)
 * Prec 64.490%
best acc: 65.180000
Epoch: [695][0/98]      Time 4.012 (4.012)      Data 3.991 (3.991)      Loss
0.9710 (0.9710)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.540 (3.540)      Loss 1.1724 (1.1724)    Prec 63.867%
(63.867%)
 * Prec 64.010%
best acc: 65.180000
Epoch: [696][0/98]      Time 4.070 (4.070)      Data 4.049 (4.049)      Loss
0.9541 (0.9541)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.484 (3.484)      Loss 1.1498 (1.1498)    Prec 65.234%
(65.234%)
 * Prec 64.670%
best acc: 65.180000
Epoch: [697][0/98]      Time 4.132 (4.132)      Data 4.031 (4.031)      Loss
0.9781 (0.9781)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.513 (3.513)      Loss 1.1576 (1.1576)    Prec 64.453%
(64.453%)
 * Prec 64.780%
best acc: 65.180000
Epoch: [698][0/98]      Time 4.052 (4.052)      Data 4.032 (4.032)      Loss
0.9597 (0.9597)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.532 (3.532)      Loss 1.1376 (1.1376)    Prec 64.062%
(64.062%)
 * Prec 64.740%
best acc: 65.180000
Epoch: [699][0/98]      Time 4.065 (4.065)      Data 4.044 (4.044)      Loss
0.9246 (0.9246)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.531 (3.531)      Loss 1.1532 (1.1532)    Prec 63.867%
(63.867%)
 * Prec 64.430%
best acc: 65.180000
Epoch: [700][0/98]      Time 4.054 (4.054)      Data 4.033 (4.033)      Loss
0.9455 (0.9455)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.499 (3.499)      Loss 1.1375 (1.1375)    Prec 64.648%
(64.648%)
 * Prec 64.050%
best acc: 65.180000
Epoch: [701][0/98]      Time 4.203 (4.203)      Data 4.098 (4.098)      Loss
0.9967 (0.9967)    Prec 68.750% (68.750%)
Validation starts
```

```
Test: [0/20]    Time 3.463 (3.463)      Loss 1.1505 (1.1505)    Prec 66.016%
(66.016%)
 * Prec 64.650%
best acc: 65.180000
Epoch: [702][0/98]      Time 4.071 (4.071)      Data 4.050 (4.050)      Loss
0.9627 (0.9627)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.484 (3.484)      Loss 1.1408 (1.1408)    Prec 64.648%
(64.648%)
 * Prec 64.700%
best acc: 65.180000
Epoch: [703][0/98]      Time 4.067 (4.067)      Data 4.046 (4.046)      Loss
0.9513 (0.9513)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.483 (3.483)      Loss 1.1613 (1.1613)    Prec 64.258%
(64.258%)
 * Prec 64.960%
best acc: 65.180000
Epoch: [704][0/98]      Time 4.041 (4.041)      Data 4.019 (4.019)      Loss
0.9474 (0.9474)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.580 (3.580)      Loss 1.1477 (1.1477)    Prec 64.453%
(64.453%)
 * Prec 64.760%
best acc: 65.180000
Epoch: [705][0/98]      Time 4.019 (4.019)      Data 3.996 (3.996)      Loss
0.8970 (0.8970)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.586 (3.586)      Loss 1.1677 (1.1677)    Prec 63.281%
(63.281%)
 * Prec 63.890%
best acc: 65.180000
Epoch: [706][0/98]      Time 4.076 (4.076)      Data 4.055 (4.055)      Loss
0.9149 (0.9149)    Prec 75.000% (75.000%)
Validation starts
Test: [0/20]    Time 3.477 (3.477)      Loss 1.1346 (1.1346)    Prec 66.406%
(66.406%)
 * Prec 64.560%
best acc: 65.180000
Epoch: [707][0/98]      Time 4.063 (4.063)      Data 4.040 (4.040)      Loss
0.9447 (0.9447)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.555 (3.555)      Loss 1.1708 (1.1708)    Prec 66.016%
(66.016%)
 * Prec 65.010%
best acc: 65.180000
Epoch: [708][0/98]      Time 4.069 (4.069)      Data 4.047 (4.047)      Loss
0.9408 (0.9408)    Prec 70.312% (70.312%)
```

```
Validation starts
Test: [0/20]    Time 3.513 (3.513)      Loss 1.1794 (1.1794)    Prec 63.477%
(63.477%)
 * Prec 64.920%
best acc: 65.180000
Epoch: [709][0/98]      Time 4.079 (4.079)      Data 4.056 (4.056)      Loss
0.9034 (0.9034)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1653 (1.1653)    Prec 63.867%
(63.867%)
 * Prec 64.640%
best acc: 65.180000
Epoch: [710][0/98]      Time 4.040 (4.040)      Data 4.016 (4.016)      Loss
0.9602 (0.9602)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.500 (3.500)      Loss 1.1324 (1.1324)    Prec 64.648%
(64.648%)
 * Prec 64.900%
best acc: 65.180000
Epoch: [711][0/98]      Time 4.032 (4.032)      Data 4.010 (4.010)      Loss
0.9307 (0.9307)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.496 (3.496)      Loss 1.1779 (1.1779)    Prec 63.867%
(63.867%)
 * Prec 64.620%
best acc: 65.180000
Epoch: [712][0/98]      Time 4.057 (4.057)      Data 4.037 (4.037)      Loss
0.9868 (0.9868)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.502 (3.502)      Loss 1.1506 (1.1506)    Prec 64.453%
(64.453%)
 * Prec 64.930%
best acc: 65.180000
Epoch: [713][0/98]      Time 4.066 (4.066)      Data 4.044 (4.044)      Loss
0.9716 (0.9716)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.498 (3.498)      Loss 1.1746 (1.1746)    Prec 63.672%
(63.672%)
 * Prec 64.650%
best acc: 65.180000
Epoch: [714][0/98]      Time 4.183 (4.183)      Data 4.082 (4.082)      Loss
0.9536 (0.9536)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.515 (3.515)      Loss 1.1437 (1.1437)    Prec 64.062%
(64.062%)
 * Prec 64.880%
best acc: 65.180000
Epoch: [715][0/98]      Time 4.046 (4.046)      Data 4.023 (4.023)      Loss
```

```
0.9492 (0.9492)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.480 (3.480)      Loss 1.1700 (1.1700)    Prec 65.625%
(65.625%)
 * Prec 64.820%
best acc: 65.180000
Epoch: [716][0/98]      Time 4.064 (4.064)      Data 4.042 (4.042)      Loss
0.9452 (0.9452)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.481 (3.481)      Loss 1.1593 (1.1593)    Prec 64.258%
(64.258%)
 * Prec 64.830%
best acc: 65.180000
Epoch: [717][0/98]      Time 4.056 (4.056)      Data 4.034 (4.034)      Loss
0.9393 (0.9393)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.467 (3.467)      Loss 1.1387 (1.1387)    Prec 64.648%
(64.648%)
 * Prec 64.940%
best acc: 65.180000
Epoch: [718][0/98]      Time 4.079 (4.079)      Data 4.057 (4.057)      Loss
0.9466 (0.9466)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.481 (3.481)      Loss 1.1390 (1.1390)    Prec 64.258%
(64.258%)
 * Prec 64.220%
best acc: 65.180000
Epoch: [719][0/98]      Time 4.137 (4.137)      Data 4.036 (4.036)      Loss
0.9875 (0.9875)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.493 (3.493)      Loss 1.1619 (1.1619)    Prec 63.672%
(63.672%)
 * Prec 64.220%
best acc: 65.180000
Epoch: [720][0/98]      Time 4.077 (4.077)      Data 4.055 (4.055)      Loss
0.9668 (0.9668)    Prec 66.797% (66.797%)
Validation starts
Test: [0/20]    Time 3.490 (3.490)      Loss 1.1532 (1.1532)    Prec 64.453%
(64.453%)
 * Prec 65.010%
best acc: 65.180000
Epoch: [721][0/98]      Time 4.039 (4.039)      Data 4.014 (4.014)      Loss
0.9473 (0.9473)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.494 (3.494)      Loss 1.1404 (1.1404)    Prec 64.258%
(64.258%)
 * Prec 64.230%
best acc: 65.180000
```

```
Epoch: [722][0/98]      Time 4.063 (4.063)      Data 4.042 (4.042)      Loss
0.9580 (0.9580)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.488 (3.488)      Loss 1.1417 (1.1417)    Prec 66.406%
(66.406%)
 * Prec 64.830%
best acc: 65.180000
Epoch: [723][0/98]      Time 4.074 (4.074)      Data 4.053 (4.053)      Loss
0.9770 (0.9770)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.483 (3.483)      Loss 1.1652 (1.1652)    Prec 66.602%
(66.602%)
 * Prec 64.880%
best acc: 65.180000
Epoch: [724][0/98]      Time 4.150 (4.150)      Data 4.048 (4.048)      Loss
0.9799 (0.9799)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.493 (3.493)      Loss 1.1601 (1.1601)    Prec 63.281%
(63.281%)
 * Prec 64.390%
best acc: 65.180000
Epoch: [725][0/98]      Time 4.055 (4.055)      Data 4.033 (4.033)      Loss
0.9913 (0.9913)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.597 (3.597)      Loss 1.1909 (1.1909)    Prec 63.672%
(63.672%)
 * Prec 65.100%
best acc: 65.180000
Epoch: [726][0/98]      Time 4.041 (4.041)      Data 4.019 (4.019)      Loss
0.9447 (0.9447)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.485 (3.485)      Loss 1.1715 (1.1715)    Prec 63.672%
(63.672%)
 * Prec 64.800%
best acc: 65.180000
Epoch: [727][0/98]      Time 4.080 (4.080)      Data 4.058 (4.058)      Loss
0.9647 (0.9647)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.485 (3.485)      Loss 1.1579 (1.1579)    Prec 63.477%
(63.477%)
 * Prec 64.460%
best acc: 65.180000
Epoch: [728][0/98]      Time 4.070 (4.070)      Data 4.046 (4.046)      Loss
0.9514 (0.9514)    Prec 74.609% (74.609%)
Validation starts
Test: [0/20]    Time 3.482 (3.482)      Loss 1.1494 (1.1494)    Prec 64.062%
(64.062%)
 * Prec 64.480%
```

```
best acc: 65.180000
Epoch: [729][0/98]      Time 4.133 (4.133)      Data 4.109 (4.109)      Loss
1.0021 (1.0021)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.485 (3.485)      Loss 1.1734 (1.1734)    Prec 63.281%
(63.281%)
 * Prec 64.470%
best acc: 65.180000
Epoch: [730][0/98]      Time 4.024 (4.024)      Data 4.001 (4.001)      Loss
0.9475 (0.9475)    Prec 73.828% (73.828%)
Validation starts
Test: [0/20]    Time 3.486 (3.486)      Loss 1.1549 (1.1549)    Prec 65.234%
(65.234%)
 * Prec 64.340%
best acc: 65.180000
Epoch: [731][0/98]      Time 4.079 (4.079)      Data 4.059 (4.059)      Loss
0.9538 (0.9538)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.462 (3.462)      Loss 1.1573 (1.1573)    Prec 66.016%
(66.016%)
 * Prec 64.770%
best acc: 65.180000
Epoch: [732][0/98]      Time 4.070 (4.070)      Data 4.049 (4.049)      Loss
0.9748 (0.9748)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.452 (3.452)      Loss 1.1511 (1.1511)    Prec 64.844%
(64.844%)
 * Prec 64.930%
best acc: 65.180000
Epoch: [733][0/98]      Time 4.084 (4.084)      Data 4.062 (4.062)      Loss
1.0236 (1.0236)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.462 (3.462)      Loss 1.1579 (1.1579)    Prec 63.867%
(63.867%)
 * Prec 64.590%
best acc: 65.180000
Epoch: [734][0/98]      Time 4.084 (4.084)      Data 4.064 (4.064)      Loss
0.9602 (0.9602)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.484 (3.484)      Loss 1.1533 (1.1533)    Prec 64.062%
(64.062%)
 * Prec 64.440%
best acc: 65.180000
Epoch: [735][0/98]      Time 4.058 (4.058)      Data 4.034 (4.034)      Loss
0.9558 (0.9558)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.486 (3.486)      Loss 1.1663 (1.1663)    Prec 64.062%
(64.062%)
```

```
 * Prec 64.790%
best acc: 65.180000
Epoch: [736][0/98]      Time 4.048 (4.048)      Data 4.026 (4.026)      Loss
0.9520 (0.9520)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.462 (3.462)      Loss 1.1518 (1.1518)    Prec 64.453%
(64.453%)
 * Prec 64.490%
best acc: 65.180000
Epoch: [737][0/98]      Time 4.010 (4.010)      Data 3.988 (3.988)      Loss
0.9870 (0.9870)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.512 (3.512)      Loss 1.1711 (1.1711)    Prec 63.867%
(63.867%)
 * Prec 64.900%
best acc: 65.180000
Epoch: [738][0/98]      Time 4.153 (4.153)      Data 4.049 (4.049)      Loss
0.9553 (0.9553)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.505 (3.505)      Loss 1.1870 (1.1870)    Prec 63.086%
(63.086%)
 * Prec 64.850%
best acc: 65.180000
Epoch: [739][0/98]      Time 4.073 (4.073)      Data 4.052 (4.052)      Loss
0.9190 (0.9190)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.506 (3.506)      Loss 1.1763 (1.1763)    Prec 65.234%
(65.234%)
 * Prec 64.670%
best acc: 65.180000
Epoch: [740][0/98]      Time 4.040 (4.040)      Data 4.018 (4.018)      Loss
0.9637 (0.9637)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.500 (3.500)      Loss 1.1520 (1.1520)    Prec 65.430%
(65.430%)
 * Prec 64.980%
best acc: 65.180000
Epoch: [741][0/98]      Time 4.036 (4.036)      Data 4.014 (4.014)      Loss
0.9495 (0.9495)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.494 (3.494)      Loss 1.1680 (1.1680)    Prec 63.867%
(63.867%)
 * Prec 64.750%
best acc: 65.180000
Epoch: [742][0/98]      Time 4.042 (4.042)      Data 4.020 (4.020)      Loss
0.9048 (0.9048)    Prec 74.219% (74.219%)
Validation starts
Test: [0/20]    Time 3.488 (3.488)      Loss 1.1644 (1.1644)    Prec 64.844%
```

```
(64.844%)
 * Prec 64.910%
best acc: 65.180000
Epoch: [743][0/98]      Time 4.084 (4.084)      Data 4.062 (4.062)      Loss
0.9503 (0.9503)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.463 (3.463)      Loss 1.1739 (1.1739)    Prec 65.625%
(65.625%)
 * Prec 64.620%
best acc: 65.180000
Epoch: [744][0/98]      Time 4.227 (4.227)      Data 4.124 (4.124)      Loss
0.9342 (0.9342)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.497 (3.497)      Loss 1.1424 (1.1424)    Prec 65.039%
(65.039%)
 * Prec 64.490%
best acc: 65.180000
Epoch: [745][0/98]      Time 4.060 (4.060)      Data 4.039 (4.039)      Loss
0.9388 (0.9388)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.479 (3.479)      Loss 1.1517 (1.1517)    Prec 64.453%
(64.453%)
 * Prec 64.510%
best acc: 65.180000
Epoch: [746][0/98]      Time 4.035 (4.035)      Data 4.013 (4.013)      Loss
0.9492 (0.9492)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.490 (3.490)      Loss 1.1511 (1.1511)    Prec 64.844%
(64.844%)
 * Prec 65.110%
best acc: 65.180000
Epoch: [747][0/98]      Time 4.057 (4.057)      Data 4.034 (4.034)      Loss
0.9539 (0.9539)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.487 (3.487)      Loss 1.1789 (1.1789)    Prec 63.672%
(63.672%)
 * Prec 64.290%
best acc: 65.180000
Epoch: [748][0/98]      Time 4.075 (4.075)      Data 4.054 (4.054)      Loss
0.9763 (0.9763)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.502 (3.502)      Loss 1.1368 (1.1368)    Prec 65.039%
(65.039%)
 * Prec 64.700%
best acc: 65.180000
Epoch: [749][0/98]      Time 4.060 (4.060)      Data 4.039 (4.039)      Loss
0.9818 (0.9818)    Prec 67.969% (67.969%)
Validation starts
```

```
Test: [0/20]    Time 3.473 (3.473)      Loss 1.1535 (1.1535)    Prec 64.062%
(64.062%)
 * Prec 64.310%
best acc: 65.180000
Epoch: [750][0/98]      Time 4.049 (4.049)      Data 4.026 (4.026)      Loss
0.9713 (0.9713)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.515 (3.515)      Loss 1.1583 (1.1583)    Prec 64.453%
(64.453%)
 * Prec 65.050%
best acc: 65.180000
Epoch: [751][0/98]      Time 4.061 (4.061)      Data 4.037 (4.037)      Loss
0.9299 (0.9299)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.534 (3.534)      Loss 1.1616 (1.1616)    Prec 65.625%
(65.625%)
 * Prec 64.760%
best acc: 65.180000
Epoch: [752][0/98]      Time 4.030 (4.030)      Data 4.008 (4.008)      Loss
0.9618 (0.9618)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.490 (3.490)      Loss 1.1242 (1.1242)    Prec 64.648%
(64.648%)
 * Prec 64.510%
best acc: 65.180000
Epoch: [753][0/98]      Time 4.030 (4.030)      Data 4.008 (4.008)      Loss
0.9446 (0.9446)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1408 (1.1408)    Prec 64.258%
(64.258%)
 * Prec 64.360%
best acc: 65.180000
Epoch: [754][0/98]      Time 4.102 (4.102)      Data 4.081 (4.081)      Loss
0.9399 (0.9399)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.494 (3.494)      Loss 1.1459 (1.1459)    Prec 64.453%
(64.453%)
 * Prec 64.500%
best acc: 65.180000
Epoch: [755][0/98]      Time 4.053 (4.053)      Data 4.031 (4.031)      Loss
0.9989 (0.9989)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.505 (3.505)      Loss 1.1408 (1.1408)    Prec 65.039%
(65.039%)
 * Prec 65.190%
best acc: 65.190000
Epoch: [756][0/98]      Time 4.093 (4.093)      Data 4.072 (4.072)      Loss
0.9513 (0.9513)    Prec 69.727% (69.727%)
```

```
Validation starts
Test: [0/20]    Time 3.618 (3.618)      Loss 1.1458 (1.1458)    Prec 64.258%
(64.258%)
 * Prec 64.400%
best acc: 65.190000
Epoch: [757][0/98]      Time 4.076 (4.076)      Data 4.054 (4.054)      Loss
0.9692 (0.9692)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.491 (3.491)      Loss 1.1432 (1.1432)    Prec 65.039%
(65.039%)
 * Prec 64.880%
best acc: 65.190000
Epoch: [758][0/98]      Time 4.034 (4.034)      Data 4.012 (4.012)      Loss
0.9846 (0.9846)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.515 (3.515)      Loss 1.1553 (1.1553)    Prec 64.844%
(64.844%)
 * Prec 64.860%
best acc: 65.190000
Epoch: [759][0/98]      Time 4.085 (4.085)      Data 4.064 (4.064)      Loss
0.9579 (0.9579)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.500 (3.500)      Loss 1.1268 (1.1268)    Prec 65.625%
(65.625%)
 * Prec 65.040%
best acc: 65.190000
Epoch: [760][0/98]      Time 4.058 (4.058)      Data 4.037 (4.037)      Loss
0.9836 (0.9836)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.509 (3.509)      Loss 1.1192 (1.1192)    Prec 65.625%
(65.625%)
 * Prec 65.020%
best acc: 65.190000
Epoch: [761][0/98]      Time 4.065 (4.065)      Data 4.043 (4.043)      Loss
0.9579 (0.9579)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.623 (3.623)      Loss 1.1035 (1.1035)    Prec 66.016%
(66.016%)
 * Prec 65.000%
best acc: 65.190000
Epoch: [762][0/98]      Time 4.069 (4.069)      Data 4.048 (4.048)      Loss
0.9628 (0.9628)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.459 (3.459)      Loss 1.1368 (1.1368)    Prec 65.430%
(65.430%)
 * Prec 65.120%
best acc: 65.190000
Epoch: [763][0/98]      Time 4.052 (4.052)      Data 4.030 (4.030)      Loss
```

```
0.9517 (0.9517)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.467 (3.467)      Loss 1.1489 (1.1489)    Prec 66.211%
(66.211%)
 * Prec 64.730%
best acc: 65.190000
Epoch: [764][0/98]      Time 4.081 (4.081)      Data 4.059 (4.059)      Loss
0.9361 (0.9361)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.490 (3.490)      Loss 1.1233 (1.1233)    Prec 65.430%
(65.430%)
 * Prec 64.950%
best acc: 65.190000
Epoch: [765][0/98]      Time 4.076 (4.076)      Data 4.052 (4.052)      Loss
0.9584 (0.9584)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.506 (3.506)      Loss 1.1202 (1.1202)    Prec 65.820%
(65.820%)
 * Prec 64.910%
best acc: 65.190000
Epoch: [766][0/98]      Time 4.054 (4.054)      Data 4.032 (4.032)      Loss
0.9180 (0.9180)    Prec 74.414% (74.414%)
Validation starts
Test: [0/20]    Time 3.508 (3.508)      Loss 1.1433 (1.1433)    Prec 65.039%
(65.039%)
 * Prec 64.870%
best acc: 65.190000
Epoch: [767][0/98]      Time 4.051 (4.051)      Data 4.029 (4.029)      Loss
0.9575 (0.9575)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.512 (3.512)      Loss 1.1530 (1.1530)    Prec 66.211%
(66.211%)
 * Prec 64.930%
best acc: 65.190000
Epoch: [768][0/98]      Time 4.028 (4.028)      Data 4.007 (4.007)      Loss
0.9448 (0.9448)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.492 (3.492)      Loss 1.1701 (1.1701)    Prec 65.039%
(65.039%)
 * Prec 64.810%
best acc: 65.190000
Epoch: [769][0/98]      Time 4.092 (4.092)      Data 4.070 (4.070)      Loss
0.9531 (0.9531)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.510 (3.510)      Loss 1.1437 (1.1437)    Prec 64.844%
(64.844%)
 * Prec 64.790%
best acc: 65.190000
```

```
Epoch: [770][0/98]      Time 4.133 (4.133)      Data 4.111 (4.111)      Loss
0.9691 (0.9691)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.483 (3.483)      Loss 1.1312 (1.1312)    Prec 64.453%
(64.453%)
 * Prec 64.670%
best acc: 65.190000
Epoch: [771][0/98]      Time 4.050 (4.050)      Data 4.027 (4.027)      Loss
1.0008 (1.0008)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.602 (3.602)      Loss 1.1482 (1.1482)    Prec 64.453%
(64.453%)
 * Prec 65.010%
best acc: 65.190000
Epoch: [772][0/98]      Time 4.058 (4.058)      Data 4.037 (4.037)      Loss
0.9632 (0.9632)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.518 (3.518)      Loss 1.1513 (1.1513)    Prec 64.453%
(64.453%)
 * Prec 64.910%
best acc: 65.190000
Epoch: [773][0/98]      Time 4.080 (4.080)      Data 4.058 (4.058)      Loss
0.9739 (0.9739)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.540 (3.540)      Loss 1.1484 (1.1484)    Prec 66.406%
(66.406%)
 * Prec 64.880%
best acc: 65.190000
Epoch: [774][0/98]      Time 4.122 (4.122)      Data 4.099 (4.099)      Loss
0.9418 (0.9418)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.639 (3.639)      Loss 1.1391 (1.1391)    Prec 66.406%
(66.406%)
 * Prec 64.540%
best acc: 65.190000
Epoch: [775][0/98]      Time 4.112 (4.112)      Data 4.090 (4.090)      Loss
0.9824 (0.9824)    Prec 66.602% (66.602%)
Validation starts
Test: [0/20]    Time 3.524 (3.524)      Loss 1.1479 (1.1479)    Prec 64.258%
(64.258%)
 * Prec 64.520%
best acc: 65.190000
Epoch: [776][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
0.9492 (0.9492)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.555 (3.555)      Loss 1.1439 (1.1439)    Prec 64.844%
(64.844%)
 * Prec 64.710%
```

```
best acc: 65.190000
Epoch: [777][0/98]      Time 4.104 (4.104)      Data 4.081 (4.081)      Loss
0.9972 (0.9972)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.506 (3.506)      Loss 1.1544 (1.1544)    Prec 64.453%
(64.453%)
 * Prec 64.700%
best acc: 65.190000
Epoch: [778][0/98]      Time 4.114 (4.114)      Data 4.093 (4.093)      Loss
0.9402 (0.9402)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1558 (1.1558)    Prec 64.258%
(64.258%)
 * Prec 64.330%
best acc: 65.190000
Epoch: [779][0/98]      Time 4.104 (4.104)      Data 4.082 (4.082)      Loss
0.9290 (0.9290)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1570 (1.1570)    Prec 64.062%
(64.062%)
 * Prec 64.830%
best acc: 65.190000
Epoch: [780][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9490 (0.9490)    Prec 71.289% (71.289%)
Validation starts
Test: [0/20]    Time 3.520 (3.520)      Loss 1.1388 (1.1388)    Prec 65.820%
(65.820%)
 * Prec 64.650%
best acc: 65.190000
Epoch: [781][0/98]      Time 4.188 (4.188)      Data 4.166 (4.166)      Loss
0.9517 (0.9517)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.632 (3.632)      Loss 1.1325 (1.1325)    Prec 64.648%
(64.648%)
 * Prec 64.800%
best acc: 65.190000
Epoch: [782][0/98]      Time 4.118 (4.118)      Data 4.096 (4.096)      Loss
0.9421 (0.9421)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.515 (3.515)      Loss 1.1598 (1.1598)    Prec 64.062%
(64.062%)
 * Prec 64.330%
best acc: 65.190000
Epoch: [783][0/98]      Time 4.098 (4.098)      Data 4.077 (4.077)      Loss
0.9677 (0.9677)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1628 (1.1628)    Prec 63.672%
(63.672%)
```

```
 * Prec 64.910%
best acc: 65.190000
Epoch: [784][0/98]      Time 4.133 (4.133)      Data 4.111 (4.111)      Loss
0.9402 (0.9402)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.546 (3.546)      Loss 1.1585 (1.1585)    Prec 64.258%
(64.258%)
 * Prec 64.560%
best acc: 65.190000
Epoch: [785][0/98]      Time 4.116 (4.116)      Data 4.092 (4.092)      Loss
0.9900 (0.9900)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.522 (3.522)      Loss 1.1537 (1.1537)    Prec 66.016%
(66.016%)
 * Prec 64.790%
best acc: 65.190000
Epoch: [786][0/98]      Time 4.128 (4.128)      Data 4.102 (4.102)      Loss
0.9877 (0.9877)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.529 (3.529)      Loss 1.1491 (1.1491)    Prec 64.258%
(64.258%)
 * Prec 64.960%
best acc: 65.190000
Epoch: [787][0/98]      Time 4.098 (4.098)      Data 4.076 (4.076)      Loss
0.9879 (0.9879)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.513 (3.513)      Loss 1.1453 (1.1453)    Prec 64.453%
(64.453%)
 * Prec 64.580%
best acc: 65.190000
Epoch: [788][0/98]      Time 4.095 (4.095)      Data 4.074 (4.074)      Loss
0.9134 (0.9134)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.520 (3.520)      Loss 1.1538 (1.1538)    Prec 64.258%
(64.258%)
 * Prec 64.390%
best acc: 65.190000
Epoch: [789][0/98]      Time 4.206 (4.206)      Data 4.184 (4.184)      Loss
0.9547 (0.9547)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.536 (3.536)      Loss 1.1446 (1.1446)    Prec 66.406%
(66.406%)
 * Prec 64.770%
best acc: 65.190000
Epoch: [790][0/98]      Time 4.110 (4.110)      Data 4.088 (4.088)      Loss
0.9913 (0.9913)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.542 (3.542)      Loss 1.1405 (1.1405)    Prec 65.039%
```

```
(65.039%)
 * Prec 64.840%
best acc: 65.190000
Epoch: [791][0/98]      Time 4.105 (4.105)      Data 4.083 (4.083)      Loss
0.9409 (0.9409)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.601 (3.601)      Loss 1.1505 (1.1505)    Prec 64.062%
(64.062%)
 * Prec 64.380%
best acc: 65.190000
Epoch: [792][0/98]      Time 4.187 (4.187)      Data 4.082 (4.082)      Loss
0.8885 (0.8885)    Prec 75.391% (75.391%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1265 (1.1265)    Prec 66.602%
(66.602%)
 * Prec 64.570%
best acc: 65.190000
Epoch: [793][0/98]      Time 4.121 (4.121)      Data 4.099 (4.099)      Loss
0.9572 (0.9572)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.551 (3.551)      Loss 1.1254 (1.1254)    Prec 65.039%
(65.039%)
 * Prec 64.560%
best acc: 65.190000
Epoch: [794][0/98]      Time 4.159 (4.159)      Data 4.136 (4.136)      Loss
0.9712 (0.9712)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.542 (3.542)      Loss 1.1368 (1.1368)    Prec 64.453%
(64.453%)
 * Prec 64.260%
best acc: 65.190000
Epoch: [795][0/98]      Time 4.241 (4.241)      Data 4.135 (4.135)      Loss
0.9689 (0.9689)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.525 (3.525)      Loss 1.1358 (1.1358)    Prec 64.648%
(64.648%)
 * Prec 64.850%
best acc: 65.190000
Epoch: [796][0/98]      Time 4.114 (4.114)      Data 4.093 (4.093)      Loss
0.9212 (0.9212)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.526 (3.526)      Loss 1.1326 (1.1326)    Prec 65.039%
(65.039%)
 * Prec 64.880%
best acc: 65.190000
Epoch: [797][0/98]      Time 4.095 (4.095)      Data 4.073 (4.073)      Loss
0.9493 (0.9493)    Prec 72.266% (72.266%)
Validation starts
```

```
Test: [0/20]    Time 3.512 (3.512)      Loss 1.1378 (1.1378)    Prec 64.453%
(64.453%)
 * Prec 65.030%
best acc: 65.190000
Epoch: [798][0/98]      Time 4.092 (4.092)      Data 4.071 (4.071)      Loss
0.9891 (0.9891)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.516 (3.516)      Loss 1.1160 (1.1160)    Prec 65.039%
(65.039%)
 * Prec 64.390%
best acc: 65.190000
Epoch: [799][0/98]      Time 4.167 (4.167)      Data 4.145 (4.145)      Loss
1.0284 (1.0284)    Prec 65.039% (65.039%)
Validation starts
Test: [0/20]    Time 3.510 (3.510)      Loss 1.1225 (1.1225)    Prec 65.234%
(65.234%)
 * Prec 64.990%
best acc: 65.190000
Epoch: [800][0/98]      Time 4.132 (4.132)      Data 4.110 (4.110)      Loss
0.9646 (0.9646)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.552 (3.552)      Loss 1.1373 (1.1373)    Prec 64.453%
(64.453%)
 * Prec 64.890%
best acc: 65.190000
Epoch: [801][0/98]      Time 4.096 (4.096)      Data 4.077 (4.077)      Loss
0.9513 (0.9513)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1215 (1.1215)    Prec 65.625%
(65.625%)
 * Prec 64.960%
best acc: 65.190000
Epoch: [802][0/98]      Time 4.136 (4.136)      Data 4.114 (4.114)      Loss
0.9693 (0.9693)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.496 (3.496)      Loss 1.1440 (1.1440)    Prec 65.039%
(65.039%)
 * Prec 65.030%
best acc: 65.190000
Epoch: [803][0/98]      Time 4.099 (4.099)      Data 4.072 (4.072)      Loss
1.0167 (1.0167)    Prec 66.016% (66.016%)
Validation starts
Test: [0/20]    Time 3.494 (3.494)      Loss 1.1649 (1.1649)    Prec 65.430%
(65.430%)
 * Prec 64.510%
best acc: 65.190000
Epoch: [804][0/98]      Time 4.121 (4.121)      Data 4.100 (4.100)      Loss
0.9536 (0.9536)    Prec 69.531% (69.531%)
```

```
Validation starts
Test: [0/20]    Time 3.510 (3.510)      Loss 1.1213 (1.1213)    Prec 65.234%
(65.234%)
 * Prec 65.030%
best acc: 65.190000
Epoch: [805][0/98]      Time 4.161 (4.161)      Data 4.137 (4.137)      Loss
0.9558 (0.9558)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.543 (3.543)      Loss 1.1462 (1.1462)    Prec 66.211%
(66.211%)
 * Prec 64.700%
best acc: 65.190000
Epoch: [806][0/98]      Time 4.263 (4.263)      Data 4.161 (4.161)      Loss
0.9825 (0.9825)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.546 (3.546)      Loss 1.1448 (1.1448)    Prec 65.234%
(65.234%)
 * Prec 64.940%
best acc: 65.190000
Epoch: [807][0/98]      Time 4.113 (4.113)      Data 4.092 (4.092)      Loss
1.0022 (1.0022)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.505 (3.505)      Loss 1.1139 (1.1139)    Prec 65.234%
(65.234%)
 * Prec 64.850%
best acc: 65.190000
Epoch: [808][0/98]      Time 4.137 (4.137)      Data 4.116 (4.116)      Loss
0.9759 (0.9759)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1663 (1.1663)    Prec 64.453%
(64.453%)
 * Prec 64.470%
best acc: 65.190000
Epoch: [809][0/98]      Time 4.219 (4.219)      Data 4.197 (4.197)      Loss
0.9402 (0.9402)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.597 (3.597)      Loss 1.1261 (1.1261)    Prec 64.844%
(64.844%)
 * Prec 64.510%
best acc: 65.190000
Epoch: [810][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
0.9701 (0.9701)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.545 (3.545)      Loss 1.1144 (1.1144)    Prec 64.844%
(64.844%)
 * Prec 64.310%
best acc: 65.190000
Epoch: [811][0/98]      Time 4.105 (4.105)      Data 4.083 (4.083)      Loss
```

```
0.9539 (0.9539)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.528 (3.528)      Loss 1.1266 (1.1266)    Prec 65.039%
(65.039%)
 * Prec 64.540%
best acc: 65.190000
Epoch: [812][0/98]      Time 4.111 (4.111)      Data 4.090 (4.090)      Loss
0.9157 (0.9157)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1466 (1.1466)    Prec 64.453%
(64.453%)
 * Prec 64.420%
best acc: 65.190000
Epoch: [813][0/98]      Time 4.109 (4.109)      Data 4.087 (4.087)      Loss
0.9757 (0.9757)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.666 (3.666)      Loss 1.1256 (1.1256)    Prec 65.820%
(65.820%)
 * Prec 64.940%
best acc: 65.190000
Epoch: [814][0/98]      Time 4.127 (4.127)      Data 4.106 (4.106)      Loss
0.9337 (0.9337)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.543 (3.543)      Loss 1.1491 (1.1491)    Prec 64.648%
(64.648%)
 * Prec 64.580%
best acc: 65.190000
Epoch: [815][0/98]      Time 4.121 (4.121)      Data 4.099 (4.099)      Loss
0.9983 (0.9983)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1421 (1.1421)    Prec 64.648%
(64.648%)
 * Prec 64.390%
best acc: 65.190000
Epoch: [816][0/98]      Time 4.125 (4.125)      Data 4.104 (4.104)      Loss
0.9713 (0.9713)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.578 (3.578)      Loss 1.1376 (1.1376)    Prec 65.234%
(65.234%)
 * Prec 65.040%
best acc: 65.190000
Epoch: [817][0/98]      Time 4.105 (4.105)      Data 4.085 (4.085)      Loss
0.9426 (0.9426)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.604 (3.604)      Loss 1.1326 (1.1326)    Prec 64.844%
(64.844%)
 * Prec 64.530%
best acc: 65.190000
```

```
Epoch: [818][0/98]      Time 4.139 (4.139)      Data 4.115 (4.115)      Loss
0.9557 (0.9557)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.572 (3.572)      Loss 1.1398 (1.1398)    Prec 64.648%
(64.648%)
 * Prec 64.370%
best acc: 65.190000
Epoch: [819][0/98]      Time 4.136 (4.136)      Data 4.114 (4.114)      Loss
0.9735 (0.9735)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.563 (3.563)      Loss 1.1497 (1.1497)    Prec 65.039%
(65.039%)
 * Prec 64.890%
best acc: 65.190000
Epoch: [820][0/98]      Time 4.230 (4.230)      Data 4.129 (4.129)      Loss
0.9147 (0.9147)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.543 (3.543)      Loss 1.1358 (1.1358)    Prec 64.844%
(64.844%)
 * Prec 65.020%
best acc: 65.190000
Epoch: [821][0/98]      Time 4.111 (4.111)      Data 4.088 (4.088)      Loss
0.9855 (0.9855)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.517 (3.517)      Loss 1.1543 (1.1543)    Prec 64.258%
(64.258%)
 * Prec 64.540%
best acc: 65.190000
Epoch: [822][0/98]      Time 4.197 (4.197)      Data 4.175 (4.175)      Loss
0.9712 (0.9712)    Prec 69.531% (69.531%)
Validation starts
Test: [0/20]    Time 3.563 (3.563)      Loss 1.1475 (1.1475)    Prec 64.453%
(64.453%)
 * Prec 65.040%
best acc: 65.190000
Epoch: [823][0/98]      Time 4.129 (4.129)      Data 4.107 (4.107)      Loss
0.9646 (0.9646)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.582 (3.582)      Loss 1.1551 (1.1551)    Prec 64.258%
(64.258%)
 * Prec 64.510%
best acc: 65.190000
Epoch: [824][0/98]      Time 4.113 (4.113)      Data 4.089 (4.089)      Loss
0.9624 (0.9624)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.535 (3.535)      Loss 1.1562 (1.1562)    Prec 64.258%
(64.258%)
 * Prec 64.790%
```

```
best acc: 65.190000
Epoch: [825][0/98]      Time 4.101 (4.101)      Data 4.080 (4.080)      Loss
0.9583 (0.9583)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.536 (3.536)      Loss 1.1579 (1.1579)    Prec 64.453%
(64.453%)
 * Prec 65.040%
best acc: 65.190000
Epoch: [826][0/98]      Time 4.101 (4.101)      Data 4.076 (4.076)      Loss
0.9416 (0.9416)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1327 (1.1327)    Prec 66.797%
(66.797%)
 * Prec 64.870%
best acc: 65.190000
Epoch: [827][0/98]      Time 4.131 (4.131)      Data 4.106 (4.106)      Loss
0.9724 (0.9724)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.531 (3.531)      Loss 1.1517 (1.1517)    Prec 64.062%
(64.062%)
 * Prec 64.860%
best acc: 65.190000
Epoch: [828][0/98]      Time 4.207 (4.207)      Data 4.102 (4.102)      Loss
0.9313 (0.9313)    Prec 73.633% (73.633%)
Validation starts
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1334 (1.1334)    Prec 66.797%
(66.797%)
 * Prec 64.580%
best acc: 65.190000
Epoch: [829][0/98]      Time 4.113 (4.113)      Data 4.093 (4.093)      Loss
1.0114 (1.0114)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.546 (3.546)      Loss 1.1489 (1.1489)    Prec 66.602%
(66.602%)
 * Prec 64.760%
best acc: 65.190000
Epoch: [830][0/98]      Time 4.094 (4.094)      Data 4.072 (4.072)      Loss
1.0147 (1.0147)    Prec 65.820% (65.820%)
Validation starts
Test: [0/20]    Time 3.859 (3.859)      Loss 1.1376 (1.1376)    Prec 64.844%
(64.844%)
 * Prec 65.110%
best acc: 65.190000
Epoch: [831][0/98]      Time 4.111 (4.111)      Data 4.089 (4.089)      Loss
0.9379 (0.9379)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.599 (3.599)      Loss 1.1306 (1.1306)    Prec 64.648%
(64.648%)
```

```
 * Prec 64.230%
best acc: 65.190000
Epoch: [832][0/98]      Time 4.106 (4.106)      Data 4.084 (4.084)      Loss
1.0058 (1.0058)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.547 (3.547)      Loss 1.1337 (1.1337)    Prec 64.648%
(64.648%)
 * Prec 64.480%
best acc: 65.190000
Epoch: [833][0/98]      Time 4.152 (4.152)      Data 4.131 (4.131)      Loss
0.9032 (0.9032)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.647 (3.647)      Loss 1.1451 (1.1451)    Prec 64.453%
(64.453%)
 * Prec 64.440%
best acc: 65.190000
Epoch: [834][0/98]      Time 4.099 (4.099)      Data 4.079 (4.079)      Loss
0.9231 (0.9231)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.576 (3.576)      Loss 1.1360 (1.1360)    Prec 66.602%
(66.602%)
 * Prec 64.670%
best acc: 65.190000
Epoch: [835][0/98]      Time 4.096 (4.096)      Data 4.071 (4.071)      Loss
0.9379 (0.9379)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.587 (3.587)      Loss 1.1387 (1.1387)    Prec 64.844%
(64.844%)
 * Prec 64.440%
best acc: 65.190000
Epoch: [836][0/98]      Time 4.111 (4.111)      Data 4.090 (4.090)      Loss
0.9655 (0.9655)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.626 (3.626)      Loss 1.1417 (1.1417)    Prec 65.039%
(65.039%)
 * Prec 64.300%
best acc: 65.190000
Epoch: [837][0/98]      Time 4.110 (4.110)      Data 4.086 (4.086)      Loss
0.9324 (0.9324)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.526 (3.526)      Loss 1.1553 (1.1553)    Prec 64.062%
(64.062%)
 * Prec 64.470%
best acc: 65.190000
Epoch: [838][0/98]      Time 4.106 (4.106)      Data 4.085 (4.085)      Loss
0.9579 (0.9579)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.531 (3.531)      Loss 1.1276 (1.1276)    Prec 64.648%
```

```
(64.648%)
 * Prec 64.550%
best acc: 65.190000
Epoch: [839][0/98]      Time 4.105 (4.105)      Data 4.080 (4.080)      Loss
0.9336 (0.9336)    Prec 70.312% (70.312%)
Validation starts
Test: [0/20]    Time 3.552 (3.552)      Loss 1.1323 (1.1323)    Prec 64.844%
(64.844%)
 * Prec 64.670%
best acc: 65.190000
Epoch: [840][0/98]      Time 4.068 (4.068)      Data 4.047 (4.047)      Loss
0.9602 (0.9602)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.539 (3.539)      Loss 1.1510 (1.1510)    Prec 66.016%
(66.016%)
 * Prec 64.810%
best acc: 65.190000
Epoch: [841][0/98]      Time 4.125 (4.125)      Data 4.104 (4.104)      Loss
0.9757 (0.9757)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.521 (3.521)      Loss 1.1425 (1.1425)    Prec 66.992%
(66.992%)
 * Prec 65.070%
best acc: 65.190000
Epoch: [842][0/98]      Time 4.126 (4.126)      Data 4.104 (4.104)      Loss
0.9490 (0.9490)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.547 (3.547)      Loss 1.1302 (1.1302)    Prec 65.234%
(65.234%)
 * Prec 64.610%
best acc: 65.190000
Epoch: [843][0/98]      Time 4.234 (4.234)      Data 4.133 (4.133)      Loss
0.9821 (0.9821)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.535 (3.535)      Loss 1.1198 (1.1198)    Prec 64.844%
(64.844%)
 * Prec 64.650%
best acc: 65.190000
Epoch: [844][0/98]      Time 4.116 (4.116)      Data 4.094 (4.094)      Loss
0.9694 (0.9694)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.558 (3.558)      Loss 1.1390 (1.1390)    Prec 65.234%
(65.234%)
 * Prec 64.940%
best acc: 65.190000
Epoch: [845][0/98]      Time 4.092 (4.092)      Data 4.070 (4.070)      Loss
0.9386 (0.9386)    Prec 70.703% (70.703%)
Validation starts
```

```
Test: [0/20]    Time 3.533 (3.533)      Loss 1.1534 (1.1534)    Prec 64.258%
(64.258%)
 * Prec 64.930%
best acc: 65.190000
Epoch: [846][0/98]      Time 4.094 (4.094)      Data 4.072 (4.072)      Loss
0.9514 (0.9514)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.531 (3.531)      Loss 1.1423 (1.1423)    Prec 64.258%
(64.258%)
 * Prec 64.280%
best acc: 65.190000
Epoch: [847][0/98]      Time 4.188 (4.188)      Data 4.166 (4.166)      Loss
0.9735 (0.9735)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.521 (3.521)      Loss 1.1437 (1.1437)    Prec 64.453%
(64.453%)
 * Prec 65.010%
best acc: 65.190000
Epoch: [848][0/98]      Time 4.119 (4.119)      Data 4.097 (4.097)      Loss
0.9935 (0.9935)    Prec 64.648% (64.648%)
Validation starts
Test: [0/20]    Time 3.570 (3.570)      Loss 1.1448 (1.1448)    Prec 64.258%
(64.258%)
 * Prec 64.540%
best acc: 65.190000
Epoch: [849][0/98]      Time 4.242 (4.242)      Data 4.141 (4.141)      Loss
0.9763 (0.9763)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.563 (3.563)      Loss 1.1543 (1.1543)    Prec 64.453%
(64.453%)
 * Prec 65.090%
best acc: 65.190000
Epoch: [850][0/98]      Time 4.116 (4.116)      Data 4.094 (4.094)      Loss
0.9423 (0.9423)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.531 (3.531)      Loss 1.1710 (1.1710)    Prec 64.258%
(64.258%)
 * Prec 65.180%
best acc: 65.190000
Epoch: [851][0/98]      Time 4.157 (4.157)      Data 4.133 (4.133)      Loss
0.9681 (0.9681)    Prec 69.727% (69.727%)
Validation starts
Test: [0/20]    Time 3.525 (3.525)      Loss 1.1450 (1.1450)    Prec 66.797%
(66.797%)
 * Prec 64.790%
best acc: 65.190000
Epoch: [852][0/98]      Time 4.149 (4.149)      Data 4.127 (4.127)      Loss
1.0023 (1.0023)    Prec 66.211% (66.211%)
```

```
Validation starts
Test: [0/20]    Time 3.558 (3.558)      Loss 1.1292 (1.1292)    Prec 64.648%
(64.648%)
 * Prec 64.970%
best acc: 65.190000
Epoch: [853][0/98]      Time 4.113 (4.113)      Data 4.092 (4.092)      Loss
0.9357 (0.9357)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.644 (3.644)      Loss 1.1402 (1.1402)    Prec 64.844%
(64.844%)
 * Prec 64.900%
best acc: 65.190000
Epoch: [854][0/98]      Time 4.114 (4.114)      Data 4.092 (4.092)      Loss
0.9314 (0.9314)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.565 (3.565)      Loss 1.1407 (1.1407)    Prec 66.406%
(66.406%)
 * Prec 64.870%
best acc: 65.190000
Epoch: [855][0/98]      Time 4.107 (4.107)      Data 4.082 (4.082)      Loss
0.9465 (0.9465)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.560 (3.560)      Loss 1.1369 (1.1369)    Prec 65.234%
(65.234%)
 * Prec 65.120%
best acc: 65.190000
Epoch: [856][0/98]      Time 4.140 (4.140)      Data 4.119 (4.119)      Loss
0.9913 (0.9913)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.561 (3.561)      Loss 1.1359 (1.1359)    Prec 65.039%
(65.039%)
 * Prec 65.060%
best acc: 65.190000
Epoch: [857][0/98]      Time 4.229 (4.229)      Data 4.124 (4.124)      Loss
0.9534 (0.9534)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.570 (3.570)      Loss 1.1501 (1.1501)    Prec 64.648%
(64.648%)
 * Prec 64.990%
best acc: 65.190000
Epoch: [858][0/98]      Time 4.117 (4.117)      Data 4.095 (4.095)      Loss
0.9387 (0.9387)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1660 (1.1660)    Prec 65.820%
(65.820%)
 * Prec 64.980%
best acc: 65.190000
Epoch: [859][0/98]      Time 4.111 (4.111)      Data 4.089 (4.089)      Loss
```

```
0.9246 (0.9246)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.527 (3.527)      Loss 1.1515 (1.1515)    Prec 64.844%
(64.844%)
 * Prec 65.200%
best acc: 65.200000
Epoch: [860][0/98]      Time 4.191 (4.191)      Data 4.088 (4.088)      Loss
0.9848 (0.9848)    Prec 67.383% (67.383%)
Validation starts
Test: [0/20]    Time 3.532 (3.532)      Loss 1.1293 (1.1293)    Prec 64.648%
(64.648%)
 * Prec 64.530%
best acc: 65.200000
Epoch: [861][0/98]      Time 4.109 (4.109)      Data 4.087 (4.087)      Loss
0.9759 (0.9759)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.598 (3.598)      Loss 1.1447 (1.1447)    Prec 66.797%
(66.797%)
 * Prec 64.840%
best acc: 65.200000
Epoch: [862][0/98]      Time 4.126 (4.126)      Data 4.105 (4.105)      Loss
0.9869 (0.9869)    Prec 65.430% (65.430%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1526 (1.1526)    Prec 64.062%
(64.062%)
 * Prec 64.650%
best acc: 65.200000
Epoch: [863][0/98]      Time 4.115 (4.115)      Data 4.093 (4.093)      Loss
0.9380 (0.9380)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.547 (3.547)      Loss 1.1511 (1.1511)    Prec 63.672%
(63.672%)
 * Prec 64.580%
best acc: 65.200000
Epoch: [864][0/98]      Time 4.084 (4.084)      Data 4.064 (4.064)      Loss
0.9503 (0.9503)    Prec 71.484% (71.484%)
Validation starts
Test: [0/20]    Time 3.622 (3.622)      Loss 1.1524 (1.1524)    Prec 66.406%
(66.406%)
 * Prec 64.860%
best acc: 65.200000
Epoch: [865][0/98]      Time 4.127 (4.127)      Data 4.104 (4.104)      Loss
0.9246 (0.9246)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1470 (1.1470)    Prec 64.648%
(64.648%)
 * Prec 65.070%
best acc: 65.200000
```

```
Epoch: [866][0/98]      Time 4.077 (4.077)      Data 4.056 (4.056)      Loss
0.9452 (0.9452)    Prec 72.070% (72.070%)
Validation starts
Test: [0/20]    Time 3.528 (3.528)      Loss 1.1509 (1.1509)    Prec 64.453%
(64.453%)
 * Prec 64.990%
best acc: 65.200000
Epoch: [867][0/98]      Time 4.112 (4.112)      Data 4.091 (4.091)      Loss
1.0157 (1.0157)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.519 (3.519)      Loss 1.1355 (1.1355)    Prec 65.430%
(65.430%)
 * Prec 64.940%
best acc: 65.200000
Epoch: [868][0/98]      Time 4.164 (4.164)      Data 4.142 (4.142)      Loss
0.9285 (0.9285)    Prec 70.898% (70.898%)
Validation starts
Test: [0/20]    Time 3.563 (3.563)      Loss 1.1276 (1.1276)    Prec 65.039%
(65.039%)
 * Prec 64.790%
best acc: 65.200000
Epoch: [869][0/98]      Time 4.124 (4.124)      Data 4.100 (4.100)      Loss
0.9490 (0.9490)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.645 (3.645)      Loss 1.1515 (1.1515)    Prec 64.453%
(64.453%)
 * Prec 64.840%
best acc: 65.200000
Epoch: [870][0/98]      Time 4.117 (4.117)      Data 4.096 (4.096)      Loss
0.9251 (0.9251)    Prec 72.461% (72.461%)
Validation starts
Test: [0/20]    Time 3.530 (3.530)      Loss 1.1309 (1.1309)    Prec 65.234%
(65.234%)
 * Prec 65.030%
best acc: 65.200000
Epoch: [871][0/98]      Time 4.113 (4.113)      Data 4.091 (4.091)      Loss
0.9317 (0.9317)    Prec 73.242% (73.242%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1458 (1.1458)    Prec 64.844%
(64.844%)
 * Prec 64.820%
best acc: 65.200000
Epoch: [872][0/98]      Time 4.194 (4.194)      Data 4.172 (4.172)      Loss
0.9357 (0.9357)    Prec 69.922% (69.922%)
Validation starts
Test: [0/20]    Time 3.624 (3.624)      Loss 1.1401 (1.1401)    Prec 64.844%
(64.844%)
 * Prec 64.860%
```

```
best acc: 65.200000
Epoch: [873][0/98]      Time 4.158 (4.158)      Data 4.137 (4.137)      Loss
0.9608 (0.9608)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.557 (3.557)      Loss 1.1323 (1.1323)    Prec 65.625%
(65.625%)
 * Prec 65.030%
best acc: 65.200000
Epoch: [874][0/98]      Time 4.109 (4.109)      Data 4.085 (4.085)      Loss
0.9512 (0.9512)    Prec 68.164% (68.164%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1604 (1.1604)    Prec 66.211%
(66.211%)
 * Prec 64.920%
best acc: 65.200000
Epoch: [875][0/98]      Time 4.085 (4.085)      Data 4.063 (4.063)      Loss
0.9690 (0.9690)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1380 (1.1380)    Prec 65.234%
(65.234%)
 * Prec 64.990%
best acc: 65.200000
Epoch: [876][0/98]      Time 4.121 (4.121)      Data 4.101 (4.101)      Loss
0.9335 (0.9335)    Prec 72.656% (72.656%)
Validation starts
Test: [0/20]    Time 3.544 (3.544)      Loss 1.1492 (1.1492)    Prec 64.844%
(64.844%)
 * Prec 65.010%
best acc: 65.200000
Epoch: [877][0/98]      Time 4.121 (4.121)      Data 4.098 (4.098)      Loss
0.9427 (0.9427)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.557 (3.557)      Loss 1.1196 (1.1196)    Prec 65.625%
(65.625%)
 * Prec 64.970%
best acc: 65.200000
Epoch: [878][0/98]      Time 4.128 (4.128)      Data 4.106 (4.106)      Loss
0.9658 (0.9658)    Prec 68.945% (68.945%)
Validation starts
Test: [0/20]    Time 3.636 (3.636)      Loss 1.1348 (1.1348)    Prec 65.430%
(65.430%)
 * Prec 65.090%
best acc: 65.200000
Epoch: [879][0/98]      Time 4.087 (4.087)      Data 4.066 (4.066)      Loss
0.9358 (0.9358)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.558 (3.558)      Loss 1.1384 (1.1384)    Prec 65.039%
(65.039%)
```

```
 * Prec 64.770%
best acc: 65.200000
Epoch: [880][0/98]      Time 4.203 (4.203)      Data 4.180 (4.180)      Loss
0.9579 (0.9579)    Prec 68.750% (68.750%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1285 (1.1285)    Prec 65.039%
(65.039%)
 * Prec 64.960%
best acc: 65.200000
Epoch: [881][0/98]      Time 4.158 (4.158)      Data 4.137 (4.137)      Loss
0.9712 (0.9712)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.523 (3.523)      Loss 1.1288 (1.1288)    Prec 65.234%
(65.234%)
 * Prec 64.990%
best acc: 65.200000
Epoch: [882][0/98]      Time 4.143 (4.143)      Data 4.089 (4.089)      Loss
0.9100 (0.9100)    Prec 71.680% (71.680%)
Validation starts
Test: [0/20]    Time 3.528 (3.528)      Loss 1.1571 (1.1571)    Prec 64.258%
(64.258%)
 * Prec 64.930%
best acc: 65.200000
Epoch: [883][0/98]      Time 4.083 (4.083)      Data 4.061 (4.061)      Loss
0.9670 (0.9670)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.529 (3.529)      Loss 1.1520 (1.1520)    Prec 64.258%
(64.258%)
 * Prec 64.840%
best acc: 65.200000
Epoch: [884][0/98]      Time 4.126 (4.126)      Data 4.104 (4.104)      Loss
0.9203 (0.9203)    Prec 73.438% (73.438%)
Validation starts
Test: [0/20]    Time 3.529 (3.529)      Loss 1.1371 (1.1371)    Prec 64.844%
(64.844%)
 * Prec 64.910%
best acc: 65.200000
Epoch: [885][0/98]      Time 4.108 (4.108)      Data 4.085 (4.085)      Loss
0.9099 (0.9099)    Prec 72.852% (72.852%)
Validation starts
Test: [0/20]    Time 3.541 (3.541)      Loss 1.1486 (1.1486)    Prec 64.844%
(64.844%)
 * Prec 64.930%
best acc: 65.200000
Epoch: [886][0/98]      Time 4.138 (4.138)      Data 4.117 (4.117)      Loss
0.9668 (0.9668)    Prec 67.188% (67.188%)
Validation starts
Test: [0/20]    Time 3.533 (3.533)      Loss 1.1500 (1.1500)    Prec 64.453%
```

```
(64.453%)
 * Prec 64.760%
best acc: 65.200000
Epoch: [887][0/98]      Time 4.194 (4.194)      Data 4.121 (4.121)      Loss
0.9492 (0.9492)    Prec 70.117% (70.117%)
Validation starts
Test: [0/20]    Time 3.534 (3.534)      Loss 1.1600 (1.1600)    Prec 64.453%
(64.453%)
 * Prec 65.020%
best acc: 65.200000
Epoch: [888][0/98]      Time 4.109 (4.109)      Data 4.087 (4.087)      Loss
0.9068 (0.9068)    Prec 74.609% (74.609%)
Validation starts
Test: [0/20]    Time 3.566 (3.566)      Loss 1.1404 (1.1404)    Prec 65.234%
(65.234%)
 * Prec 65.180%
best acc: 65.200000
Epoch: [889][0/98]      Time 4.123 (4.123)      Data 4.101 (4.101)      Loss
0.9535 (0.9535)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1422 (1.1422)    Prec 64.648%
(64.648%)
 * Prec 64.900%
best acc: 65.200000
Epoch: [890][0/98]      Time 4.192 (4.192)      Data 4.103 (4.103)      Loss
0.9690 (0.9690)    Prec 67.773% (67.773%)
Validation starts
Test: [0/20]    Time 3.559 (3.559)      Loss 1.1586 (1.1586)    Prec 64.648%
(64.648%)
 * Prec 64.900%
best acc: 65.200000
Epoch: [891][0/98]      Time 4.096 (4.096)      Data 4.075 (4.075)      Loss
0.9157 (0.9157)    Prec 72.266% (72.266%)
Validation starts
Test: [0/20]    Time 3.548 (3.548)      Loss 1.1395 (1.1395)    Prec 64.648%
(64.648%)
 * Prec 65.090%
best acc: 65.200000
Epoch: [892][0/98]      Time 4.148 (4.148)      Data 4.127 (4.127)      Loss
0.9646 (0.9646)    Prec 67.578% (67.578%)
Validation starts
Test: [0/20]    Time 3.571 (3.571)      Loss 1.1519 (1.1519)    Prec 64.648%
(64.648%)
 * Prec 64.730%
best acc: 65.200000
Epoch: [893][0/98]      Time 4.173 (4.173)      Data 4.071 (4.071)      Loss
0.9757 (0.9757)    Prec 68.750% (68.750%)
Validation starts
```

```
Test: [0/20]    Time 3.607 (3.607)      Loss 1.1462 (1.1462)    Prec 65.039%
(65.039%)
 * Prec 64.850%
best acc: 65.200000
Epoch: [894][0/98]      Time 4.122 (4.122)      Data 4.100 (4.100)      Loss
0.9957 (0.9957)    Prec 67.969% (67.969%)
Validation starts
Test: [0/20]    Time 3.554 (3.554)      Loss 1.1524 (1.1524)    Prec 64.258%
(64.258%)
 * Prec 64.880%
best acc: 65.200000
Epoch: [895][0/98]      Time 4.107 (4.107)      Data 4.085 (4.085)      Loss
0.9401 (0.9401)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.548 (3.548)      Loss 1.1353 (1.1353)    Prec 65.234%
(65.234%)
 * Prec 64.930%
best acc: 65.200000
Epoch: [896][0/98]      Time 4.133 (4.133)      Data 4.112 (4.112)      Loss
0.9446 (0.9446)    Prec 71.875% (71.875%)
Validation starts
Test: [0/20]    Time 3.562 (3.562)      Loss 1.1303 (1.1303)    Prec 65.234%
(65.234%)
 * Prec 64.840%
best acc: 65.200000
Epoch: [897][0/98]      Time 4.183 (4.183)      Data 4.079 (4.079)      Loss
0.9535 (0.9535)    Prec 69.141% (69.141%)
Validation starts
Test: [0/20]    Time 3.578 (3.578)      Loss 1.1501 (1.1501)    Prec 65.039%
(65.039%)
 * Prec 64.980%
best acc: 65.200000
Epoch: [898][0/98]      Time 4.098 (4.098)      Data 4.076 (4.076)      Loss
0.9712 (0.9712)    Prec 66.406% (66.406%)
Validation starts
Test: [0/20]    Time 3.550 (3.550)      Loss 1.1376 (1.1376)    Prec 65.039%
(65.039%)
 * Prec 64.880%
best acc: 65.200000
Epoch: [899][0/98]      Time 4.107 (4.107)      Data 4.085 (4.085)      Loss
0.9779 (0.9779)    Prec 66.992% (66.992%)
Validation starts
Test: [0/20]    Time 3.566 (3.566)      Loss 1.1488 (1.1488)    Prec 64.453%
(64.453%)
 * Prec 64.850%
best acc: 65.200000
Epoch: [900][0/98]      Time 4.128 (4.128)      Data 4.107 (4.107)      Loss
0.9427 (0.9427)    Prec 70.508% (70.508%)
```

```
Validation starts
Test: [0/20]    Time 3.589 (3.589)      Loss 1.1446 (1.1446)    Prec 64.844%
(64.844%)
 * Prec 64.930%
best acc: 65.200000
Epoch: [901][0/98]      Time 4.134 (4.134)      Data 4.112 (4.112)      Loss
0.9447 (0.9447)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.540 (3.540)      Loss 1.1424 (1.1424)    Prec 65.039%
(65.039%)
 * Prec 64.820%
best acc: 65.200000
Epoch: [902][0/98]      Time 4.351 (4.351)      Data 4.249 (4.249)      Loss
0.9690 (0.9690)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.648 (3.648)      Loss 1.1381 (1.1381)    Prec 64.844%
(64.844%)
 * Prec 64.970%
best acc: 65.200000
Epoch: [903][0/98]      Time 4.110 (4.110)      Data 4.089 (4.089)      Loss
0.9601 (0.9601)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.616 (3.616)      Loss 1.1285 (1.1285)    Prec 65.430%
(65.430%)
 * Prec 64.780%
best acc: 65.200000
Epoch: [904][0/98]      Time 4.120 (4.120)      Data 4.096 (4.096)      Loss
0.9824 (0.9824)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.593 (3.593)      Loss 1.1431 (1.1431)    Prec 64.844%
(64.844%)
 * Prec 64.870%
best acc: 65.200000
Epoch: [905][0/98]      Time 4.102 (4.102)      Data 4.082 (4.082)      Loss
0.9779 (0.9779)    Prec 69.336% (69.336%)
Validation starts
Test: [0/20]    Time 3.548 (3.548)      Loss 1.1532 (1.1532)    Prec 64.648%
(64.648%)
 * Prec 64.850%
best acc: 65.200000
Epoch: [906][0/98]      Time 4.152 (4.152)      Data 4.129 (4.129)      Loss
0.9468 (0.9468)    Prec 68.555% (68.555%)
Validation starts
Test: [0/20]    Time 3.641 (3.641)      Loss 1.1567 (1.1567)    Prec 64.062%
(64.062%)
 * Prec 64.870%
best acc: 65.200000
Epoch: [907][0/98]      Time 4.138 (4.138)      Data 4.113 (4.113)      Loss
```

```
0.9757 (0.9757)    Prec 68.359% (68.359%)
Validation starts
Test: [0/20]    Time 3.556 (3.556)      Loss 1.1627 (1.1627)    Prec 64.258%
(64.258%)
 * Prec 64.810%
best acc: 65.200000
Epoch: [908][0/98]      Time 4.125 (4.125)      Data 4.103 (4.103)      Loss
0.9553 (0.9553)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.572 (3.572)      Loss 1.1374 (1.1374)    Prec 64.844%
(64.844%)
 * Prec 64.820%
best acc: 65.200000
Epoch: [909][0/98]      Time 4.117 (4.117)      Data 4.096 (4.096)      Loss
0.9379 (0.9379)    Prec 74.023% (74.023%)
Validation starts
Test: [0/20]    Time 3.540 (3.540)      Loss 1.1455 (1.1455)    Prec 64.648%
(64.648%)
 * Prec 64.970%
best acc: 65.200000
Epoch: [910][0/98]      Time 4.202 (4.202)      Data 4.097 (4.097)      Loss
0.9512 (0.9512)    Prec 70.703% (70.703%)
Validation starts
Test: [0/20]    Time 3.548 (3.548)      Loss 1.1514 (1.1514)    Prec 64.648%
(64.648%)
 * Prec 65.020%
best acc: 65.200000
Epoch: [911][0/98]      Time 4.144 (4.144)      Data 4.121 (4.121)      Loss
0.9424 (0.9424)    Prec 70.508% (70.508%)
Validation starts
Test: [0/20]    Time 3.553 (3.553)      Loss 1.1467 (1.1467)    Prec 64.844%
(64.844%)
 * Prec 64.890%
best acc: 65.200000
Epoch: [912][0/98]      Time 4.129 (4.129)      Data 4.106 (4.106)      Loss
0.9535 (0.9535)    Prec 71.094% (71.094%)
Validation starts
Test: [0/20]    Time 3.841 (3.841)      Loss 1.1298 (1.1298)    Prec 65.234%
(65.234%)
 * Prec 64.840%
best acc: 65.200000
Epoch: [913][0/98]      Time 4.529 (4.529)      Data 4.509 (4.509)      Loss
0.9718 (0.9718)    Prec 70.117% (70.117%)
Validation starts
```

```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
```

```
Cell In[8], line 35
     33 # evaluate on test set
     34 print("Validation starts")
---> 35 prec = validate(testloader, model, criterion)
     37 # remember best precision and save checkpoint
     38 is_best = prec > best_prec

Cell In[1], line 117, in validate(val_loader, model, criterion)
    115 end = time.time()
    116 with torch.no_grad():
--> 117     for i, (input, target) in enumerate(val_loader):
    119         input, target = input.cuda(), target.cuda()
    121         # compute output

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\site-packages\torch\utils\data\da
 ↪py:494, in DataLoader.__iter__(self)
    492     return self._iterator
    493 else:
--> 494     return self._get_iterator()

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\site-packages\torch\utils\data\da
 ↪py:427, in DataLoader._get_iterator(self)
    425 else:
    426     self.check_worker_number_rationality()
--> 427     return _MultiProcessingDataLoaderIter(self)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\site-packages\torch\utils\data\da
 ↪py:1172, in _MultiProcessingDataLoaderIter.__init__(self, loader)
   1165 w.daemon = True
   1166 # NB: Process.start() actually take some time as it needs to
   1167 #     start a process and pass the arguments over via a pipe.
   1168 #     Therefore, we only add a worker to self._workers list after
   1169 #     it started, so that we do not call .join() if program dies
   1170 #     before it starts, and __del__ tries to join but will get:
   1171 #     AssertionError: can only join a started process.
-> 1172 w.start()
   1173 self._index_queues.append(index_queue)
   1174 self._workers.append(w)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\multiprocessing\process.
 ↪py:121, in BaseProcess.start(self)
    118 assert not _current_process._config.get('daemon'), \
    119        'daemonic processes are not allowed to have children'
    120 _cleanup()
--> 121 self._popen = self._Popen(self)
```

```
    122 self._sentinel = self._popen.sentinel
    123 # Avoid a refcycle if the target function holds an indirect
    124 # reference to the process object (see bpo-30775)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\multiprocessing\context.
 ↪py:224, in Process._Popen(process_obj)
    222 @staticmethod
    223 def _Popen(process_obj):
--> 224     return _default_context.get_context().Process._Popen(process_obj)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\multiprocessing\context.
 ↪py:337, in SpawnProcess._Popen(process_obj)
    334 @staticmethod
    335 def _Popen(process_obj):
    336     from .popen_spawn_win32 import Popen
--> 337     return Popen(process_obj)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\multiprocessing\popen_spawn_win32
 ↪py:97, in Popen.__init__(self, process_obj)
     95 try:
     96     reduction.dump(prep_data, to_child)
---> 97     reduction.dump(process_obj, to_child)
     98 finally:
     99     set_spawning_popen(None)

File c:
 ↪\Users\Justin\AppData\Local\Programs\Python\Python313\Lib\multiprocessing\reduction.
 ↪py:60, in dump(obj, file, protocol)
     58 def dump(obj, file, protocol=None):
     59     '''Replacement for pickle.dump() using ForkingPickler.'''
---> 60     ForkingPickler(file, protocol).dump(obj)

KeyboardInterrupt:
```

[ ]: