Machine Learning Assignment II

I. Assignment Description

In this assignment, **design a model** with some **optimization** and **regularization** tricks and try to improve the classification results on the **CIFAR-100 data set from torchvision**. The CIFAR-100 dataset has 100 classes containing 600 images each; to know more about this dataset, please refer to this website.

CIFAR-100

Your model

0.1
0.002
⋮
0.89 ⟹ Dog
0.03
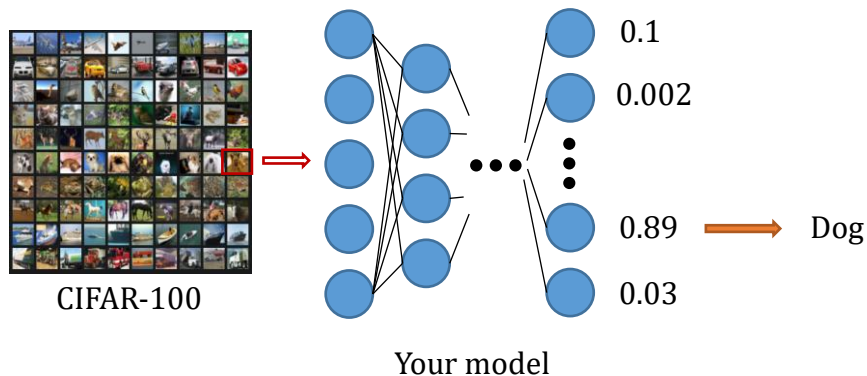
II. We will use the torchvision testing set to evaluate the classification result and use **accuracy** as the evaluation criterion. To test the accuracy by yourself, follow the testing code in the provided code.

```
correct = 0
total = 0
# since we're not training, we don't need to calculate the gradients for our outputs
with torch.no_grad():
    for data in testloader:
        images, labels = data
        images = images.to(device)
        labels = labels.to(device)
        # calculate outputs by running images through the network
        outputs = model(images)
        # the class with the highest energy is what we choose as prediction
        _, predicted = torch.max(outputs.data, 1)
        total += labels.size(0)
        correct += (predicted == labels).sum().item()

print(f'Accuracy of the network on the 10000 test images: {100 * correct // total} %')
```

III. Score

The score will be divided into two parts, the accuracy compared to other classmates (30%) and your report (70%). TAs will test your accuracy with your submitted model.

You should at least include the following items in your report:

1. What you have done (e.g., data preprocessing methods, model design, the

trick you use and why, the performance of different tricks you have tried, etc. These are just the suggestion, not the must.). <mark>You have to give some screen shot to show your code.</mark>

2. Analyze your results and try to briefly explain why it works.
3. Write a reference if you have any.
4. Our trivial result is <u>60.19%</u> (simply 20 epochs), which is a baseline we judge your performance.

IV. The format submitted

You should submit the whole model with the pth file and your report with pdf file on the new e3. The maximum model size is <mark>less than 100MB</mark>, named after <mark>hw2_ID.pth.</mark> The report is named after <mark>hw2_ID.pdf</mark>.

(Optional) If you have set the different mean and standard deviation for data processing. Please upload your mean and std with file name <mark>hw2_ID.txt</mark>, or we will use the default value on the provided code.

V. Deadline: 4/10 23:55