# Advance Machine Learning HW2

## Q5: Train the best model

### How to run the script

```
python main.py
```

### Model architecture

Due to resource limitation, I only built a <mark>six-layer</mark> convolutional network with the following architecture.

```
Conv(num_filters=32, filter_size=3) – BN – ReLU
2x2 max pooling
Conv(num_filters=64, filter_size=3) – BN – ReLU
2x2 max pooling
Affine – ReLU
Affine – softmax
```
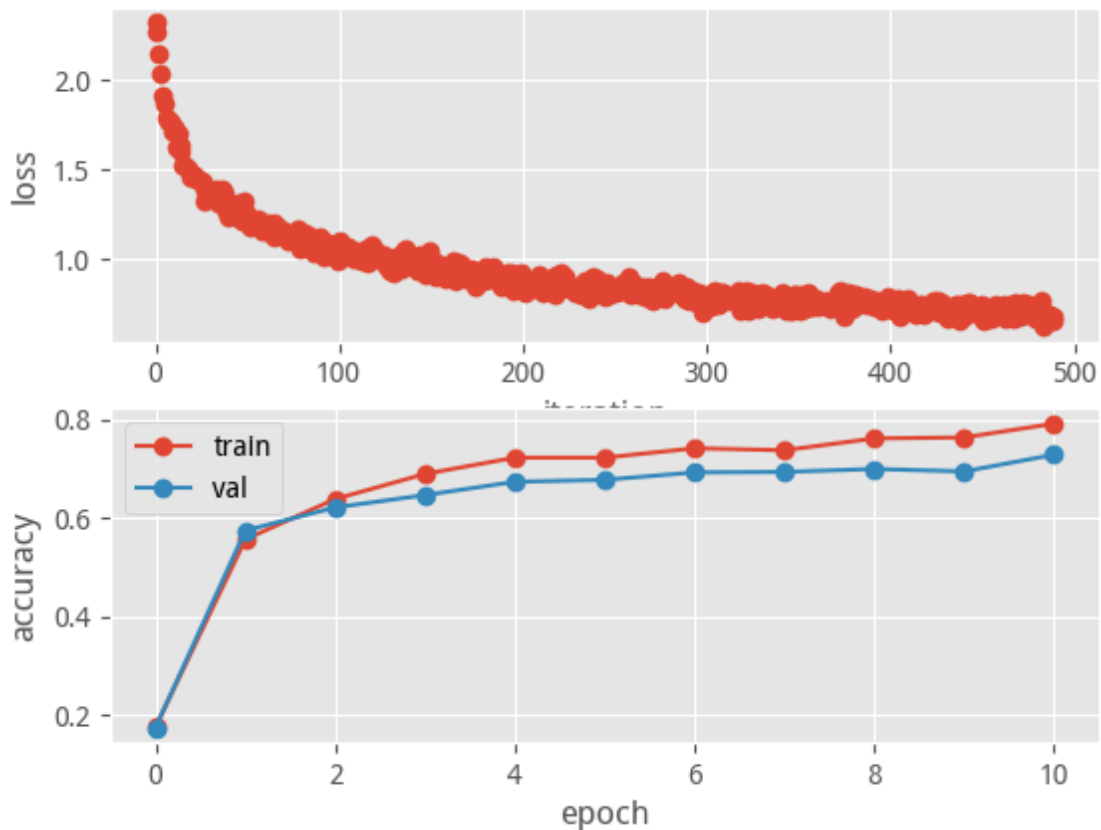
### Best result

|          | Validation | Test  |
|----------|------------|-------|
| Accuracy | 0.792      | 0.735 |

## Discussion

1. Parameter tuning is critical to the model, including:
   - Model
     - n_layer: more layer you build, more information your model can capture(good for sophisticate problem)
     - num_filters
     - filter_size
     - reg
   - Solver
     - num_epochs: more epochs, better result (may cause overfitting, so regularization or early stop is important)
     - batch_size: if you have lots of memory, you can increase you batch size to accelerate the training process
   - learning_rate