Homework 3 report

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- In activation function layer, I have difficulty when implementing softmax with focal loss using numpy matrix calculation. When constructing α_t, my previous code was:

```
alpha_t = Y@self.alpha
```

, where shape of Y is (n, C) and shape of self.alpha is (C,).

I expected that shape of alpha_t will be (n, 1), however, the result is (n,).

Then I go check out numpy document, and find out the rule:

- If the second argument is 1-D, it is promoted to a matrix by appending a 1 to its dimensions. After matrix multiplication the appended 1 is removed.

So shape of alpha_t should be (n,) instead of (n, 1). Therefore I add the reshape code after self.alpha to meet my need.

- For structure of my binary classifier(basic) is neural network (FCNN) with three 10D hidden layers with ReLU activation function and a 1D output layer with softmax activation function and chose focal loss as loss function.

For structure of my multi-class classifier(advanced) is neural network (FCNN) with five 10D hidden layers with ReLU activation function and a 10D output layer with softmax activation function and chose focal loss as loss function.

- I do some research and found out that alpha is usually been set to 0.25 and gamma is usually been set to 2, so I do as I learned.