**MaxPool2d**

For the Maxpooling2D, by implement the mechanism of the it, which is to calculate the maximum, or largest, value in each patch of each feature map.

Hence, I just write a basic function to get the max value in each time of operation and perform the operation multiple times

**AvgPool2d**

The main mechanism of average pooling is almost the same as max pooling, the only different is that the basic operation is average.

**Conv2d**

The main difference between the two conv2d function is stride, kernel size and dilation, "kernel size" means the size of a convolutional filter, to be more specifically, it refers to the width x height of the filter mask, and for the stride, stride controls the stride for the cross-correlation, a single number or a tuple, and dilation controls the spacing between the kernel points, so just by make some modification in first conv2d function, we can get the second con2d function

**ConvTranspose2d**

Transposed convolution, also known as deconvolution. It is the inverse operation of convolution, that is, the dimension of the feature is compressed, but the size is enlarged.

**Flatten**

To be simplified, the flatten operation is just transform our original matrix to an one dimensional array

**Sigmoid**

The mechanism of sigmoid function is to convert the model's output into a probability score, and its mathematical representation can be easily achieved by numpy which is 1/(1+np.exp(-x))

**batch\_norm**

The key point of batch\_norm is to calculate the mean and variance, and just following its mathematical formula, we can easily code it.

**Cross Entropy Loss & MSE Loss**

Cross entropy is mainly used in classification problem and MSE is mainly used in regression problem, cross entropy loss is the log softmax here, the formula of it is that the classification results are normalized to form a probability distribution and take the log value, for MSE, it measures the average of the squares of the errors, that is, the average squared difference between the estimated values and the actual value, so I just follow such mechanism to code.