**Exercise 8:** Adding padding to the convolutional operation can often result in better model performance, as more of the input image of feature maps are given an opportunity to participate or contribute to the output. By default, the convolutional operation uses '*valid*' padding, which means that convolutions are only applied where possible. This can be changed to `padding='same'` so that zero values are added around the input such that the output has the same size as the input. For Application 1, how is the system accuracy influenced by the padding operation?

System performance before applying padding = **'same'.** We have tested few time to get the average. The following figure shows how the accuracy increase while the cross entropy loss decreases if we apply the default padding 'valid'. Here the mean accuracy is 87.446.
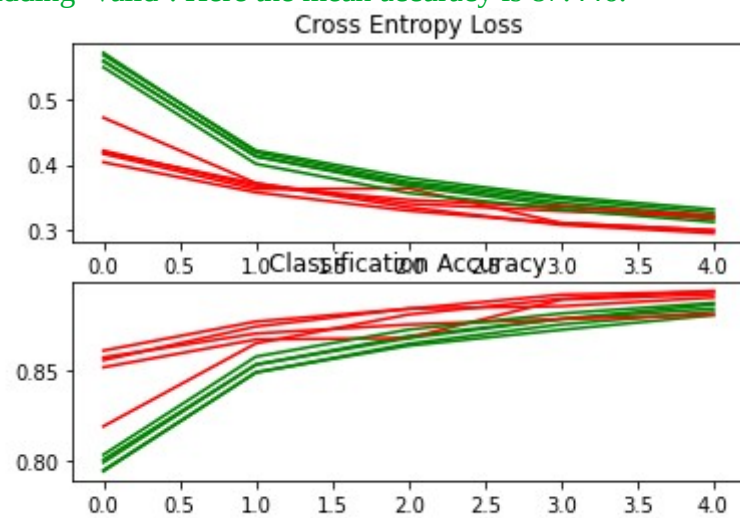

After we apply the padding = 'same', we have got the result 87.384. Which is more or less the same accuracy before applying 'same padding'. We have tested several times to make sure. However, we did not find any significant changes in this model performance.

Accuracy: mean = 87.384 std = 0.403, n = 5
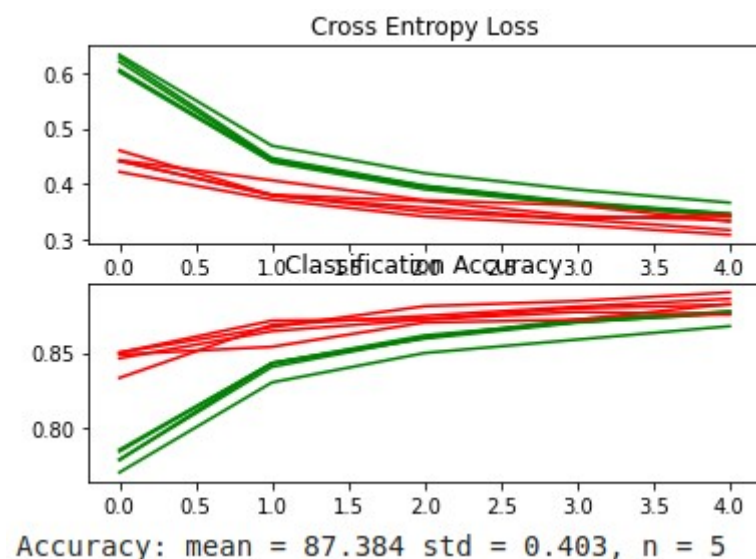
Exercise 9: An increase in the number of filters used in the convolutional layer can often improve performance, as it can provide more opportunity for extracting simple features from the input images. This is especially relevant when very small filters are used, such as 3×3 pixels. By applying the padding operation (`padding='same'`) within the convolutional process, increase the number of filters (in the convolutional layer) from 32 to double that at 64. For Application 1, how is the system accuracy influenced by this parameter?

After we apply the padding = 'same', we have got the result 87.798.

Accuracy: mean = 87.798 std = 0.460, n = 5
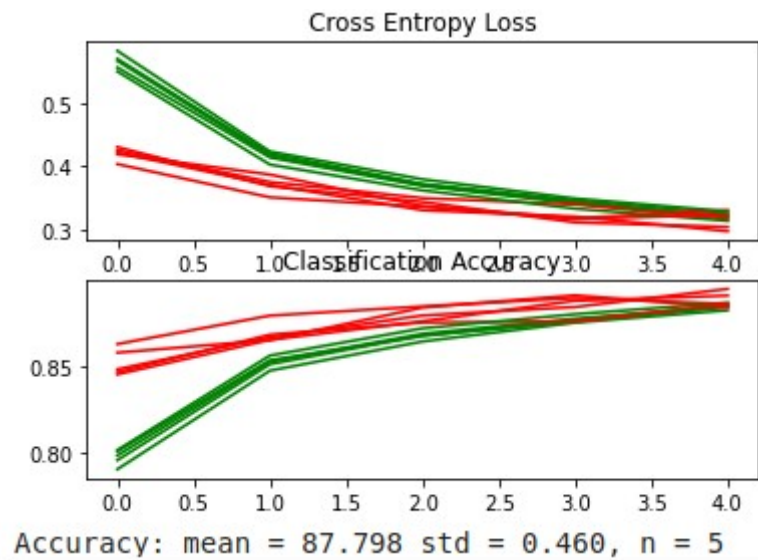
We did not find any significant changes in this data-set if we apply padding 'same'.