

## eBNN on MNIST Dataset

In the mnist\_data.h there are two arrays which are train\_data and train\_labels.

Train\_data array size is 15680 and it represents the weights of the binary neural network.

Train\_labels is the array consist of numbers we want ebnn to predict. Train\_labels array size is 20.

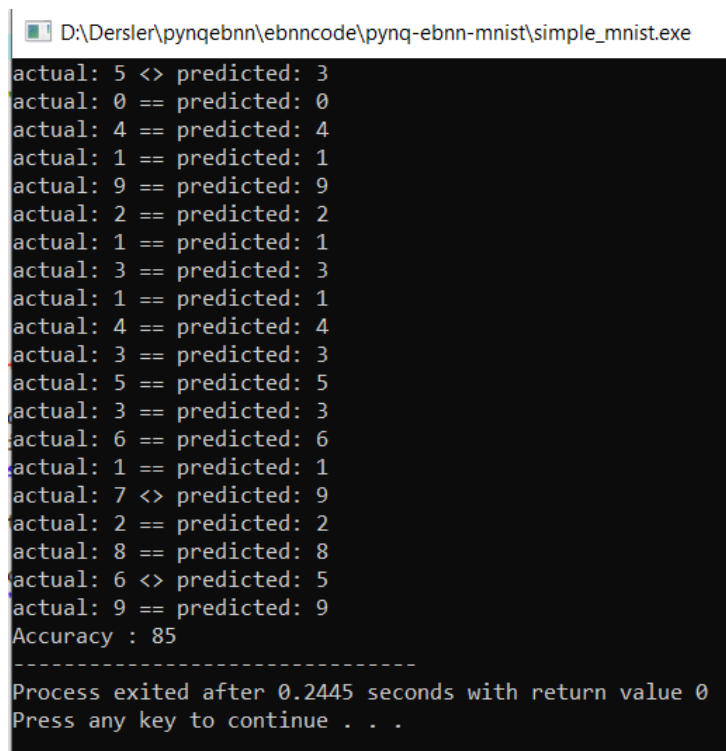
Mnist dataset consist of numbers between 0-9 with the size of 28x28 grayscale images.

# pictures we want to predict=20

# pixels in 20 picture=  $20 \times 28 \times 28 = 15680$

# weights for 20 picture (for each pixel)= 15680

In the below picture, eBNN's accuracy is 85%.



```
D:\Dersler\pynqebnn\ebnncode\pynq-ebnn-mnist\simple_mnist.exe
actual: 5 <> predicted: 3
actual: 0 == predicted: 0
actual: 4 == predicted: 4
actual: 1 == predicted: 1
actual: 9 == predicted: 9
actual: 2 == predicted: 2
actual: 1 == predicted: 1
actual: 3 == predicted: 3
actual: 1 == predicted: 1
actual: 4 == predicted: 4
actual: 3 == predicted: 3
actual: 5 == predicted: 5
actual: 3 == predicted: 3
actual: 6 == predicted: 6
actual: 1 == predicted: 1
actual: 7 <> predicted: 9
actual: 2 == predicted: 2
actual: 8 == predicted: 8
actual: 6 <> predicted: 5
actual: 9 == predicted: 9
Accuracy : 85
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Process exited after 0.2445 seconds with return value 0
Press any key to continue . . .
```