

# Manoj Kumar Selvaraj

## Assignment 1:

Model:

Model: "sequential_3"		
Layer (type)	Output Shape	Param #
conv2d_14 (Conv2D)	(None, 1, 3200, 8)	40
batch_normalization_9 (BatchNormalization)	(None, 1, 3200, 8)	32
re_lu_5 (ReLU)	(None, 1, 3200, 8)	0
conv2d_15 (Conv2D)	(None, 1, 640, 8)	320
batch_normalization_10 (BatchNormalization)	(None, 1, 640, 8)	32
re_lu_6 (ReLU)	(None, 1, 640, 8)	0
max_pooling2d_3 (MaxPooling2D)	(None, 1, 128, 8)	0
conv2d_16 (Conv2D)	(None, 1, 25, 8)	320
batch_normalization_11 (BatchNormalization)	(None, 1, 25, 8)	32
re_lu_7 (ReLU)	(None, 1, 25, 8)	0
conv2d_17 (Conv2D)	(None, 1, 5, 8)	320
batch_normalization_12 (BatchNormalization)	(None, 1, 5, 8)	32
re_lu_8 (ReLU)	(None, 1, 5, 8)	0
conv2d_18 (Conv2D)	(None, 1, 1, 8)	320
batch_normalization_13 (BatchNormalization)	(None, 1, 1, 8)	32
re_lu_9 (ReLU)	(None, 1, 1, 8)	0
global_max_pooling2d_3 (GlobalMaxPooling2D)	(None, 8)	0
dropout_3 (Dropout)	(None, 8)	0
dense_3 (Dense)	(None, 2)	18
Total params: 1,498 (5.85 KB)		
Trainable params: 1,418 (5.54 KB)		
Non-trainable params: 80 (320.00 B)		

Strided 1D convolutions were used to quickly reduce the long input sequence while preserving temporal patterns. Small filters without bias, combined with repeated conv–batch norm .ReLU

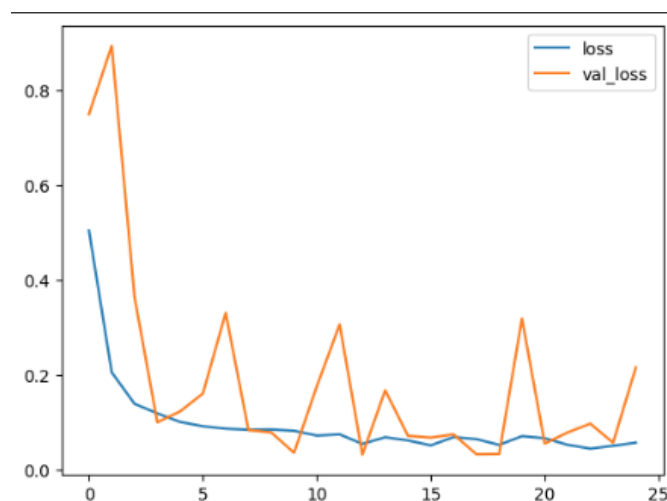
blocks, keep the network compact and stable. ReLU activations were capped at 6 to support int8 quantization. Global max pooling captures the most important features without requiring large dense layers, while dropout helps prevent overfitting. A minimal softmax output layer with just 2 units further reduces parameters.

Report should have the following table:

	Accuracy
Tensorflow model	99.00%
Tflite model	99.00%
On hardware	<b>99.254%</b>

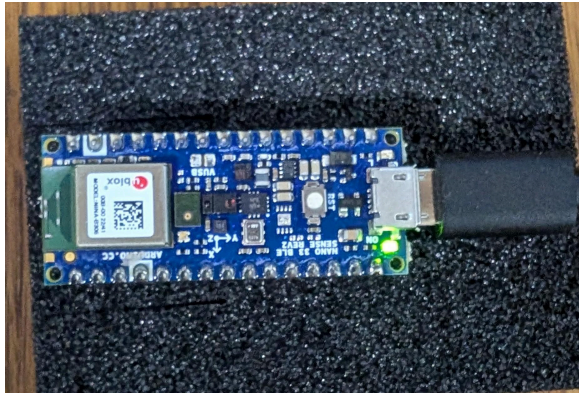
	Size
Tflite model	10108 bytes
Tflite quantized model	<b>7592 bytes</b>

**Training:**



## Hardware:

On hardware the accuracy is 99.254%



```
File Edit Selection View Go Run Terminal Help
PROBLEMS DEBUG CONSOLE TERMINAL PORTS SERIAL MONITOR

OUTPUT
381 0.0 1.0
382 0.0 1.0
383 0.0 1.0
384 0.05 0.95
385 0.01 0.99
386 0.0 1.0
387 0.0 1.0
388 0.0 1.0
389 0.0 1.0
390 0.11 0.89
391 0.05 0.95
392 0.0 1.0
393 0.18 0.82
394 0.13 0.88
395 0.02 0.98
396 0.01 0.99
397 0.0 1.0
398 0.0 1.0
399 0.0 1.0
400 0.0 1.0
401 0.14 0.86

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Accuracy of the hardware: 0.9925373134328358

[Done] exited with code=0 in 4244.861 seconds

TERMINAL
PS C:\Users\Manoj>
```