

WEEK -3
LOB LOGBOOK

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ASSIGNMENT - WEEK 3

Accuracy :

```
[45]: test_loss, test_acc = model.evaluate(test_images, test_labels, verbose=2)
      print('\nTest accuracy:', test_acc)

313/313 - 9s - 27ms/step - accuracy: 0.8740 - loss: 0.5104
```

Code :

```
[44]: print(model.summary(line_length=None,
      positions=None,
      print_fn=None,
      expand_nested=False,
      show_trainable=False,
      layer_range=None))
```

Model: "sequential"

Layer (type)	Output Shape	Param #
flatten (Flatten)	(None, 784)	0
dense (Dense)	(None, 150)	117,750
dense_1 (Dense)	(None, 20)	3,020
dense_2 (Dense)	(None, 180)	3,780
dense_3 (Dense)	(None, 10)	1,810

Total params: 379,082 (1.45 MB)

Trainable params: 126,360 (493.59 KB)

Non-trainable params: 0 (0.00 B)

Optimizer params: 252,722 (987.20 KB)

None

```
[21]: # The result will be different, as your particular unique model should be demonstrated here
```

Sum:

$$w_1, w_2, w_3, w_4, w_5, w_6, w_7, w_8 = 0.2$$

$$w_9 = w_{10} = w_{11} = w_{12} = 0.1$$

$$w_{13} = w_{14} = w_{15} = w_{16} = 0.3$$

$$\begin{aligned} \textcircled{3} \quad z_1 = z_2 &= 0.2(x_1 + x_2 + x_3 + x_4) \\ &= 0.2 \cdot 4(23 + 32 + 56 + 48) \\ &= 0.2 \cdot 159 \cdot 4 = \underline{31.8} \end{aligned}$$

New var:

$$y = \frac{3510}{8964879}$$

$$z = b + \sum_{i=1}^m w_i x_i$$

↑
inputs

$$b = 0$$

$$\begin{aligned} \textcircled{4} \quad y > 0 &\Rightarrow h_1 = h_2 = \text{Relu} \\ (z_1, z_2) &= 31.8 \cdot y \end{aligned}$$

$$\textcircled{5} \quad z_3 = z_4 = 0.1(h_1 + h_2) = 0.1 \cdot 2 \cdot 31.8 \cdot y = 6.36 \cdot y$$

$$\textcircled{6} \quad y > 0 \Rightarrow h_3 = h_4 = \text{Relu} \left(\frac{z_3}{z_4} \right) = 6.36 \cdot y$$

$$\textcircled{7} \quad 0.3(h_3 + h_4) = 0.3 \cdot 2 \cdot 6.36 \cdot y = 3.816 \cdot y$$

$$\textcircled{8} \quad z_5 = z_6 = 3.816 \cdot y + 0.5$$

$$\begin{aligned} \textcircled{9} \quad o_1 = o_2 &= \sigma \left(\frac{z_5}{z_6} \right) = \sigma(3.816 \cdot y + 0.5) \\ &= \sigma \left(3.816 \cdot \frac{3510}{8964879} + 0.5 \right) \end{aligned}$$

$$3510 = \frac{2373000}{8964879} + 0.5$$

$$\begin{aligned} \Rightarrow o_1 = o_2 &= \sigma \left(3.816 \cdot \frac{2373000}{8964879} + 0.5 \right) \\ &= \sigma(1.5100937) \end{aligned}$$

$$\approx \underline{\underline{0.819}}$$

