



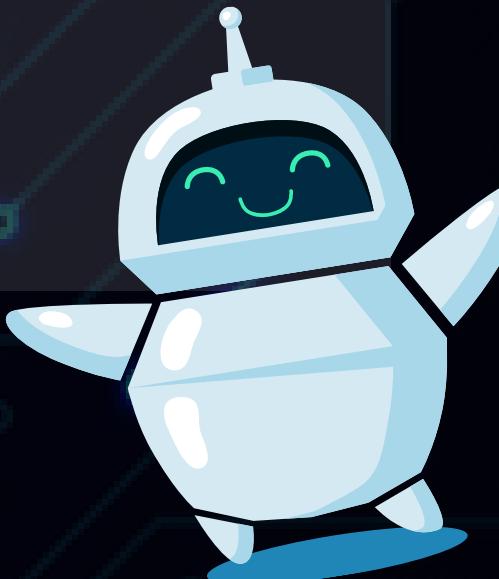
# FLICKER RECOGNITION

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4MI0800060

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ЕКИП

Руси Шишманов

4MI0800060

Рангел Плачков

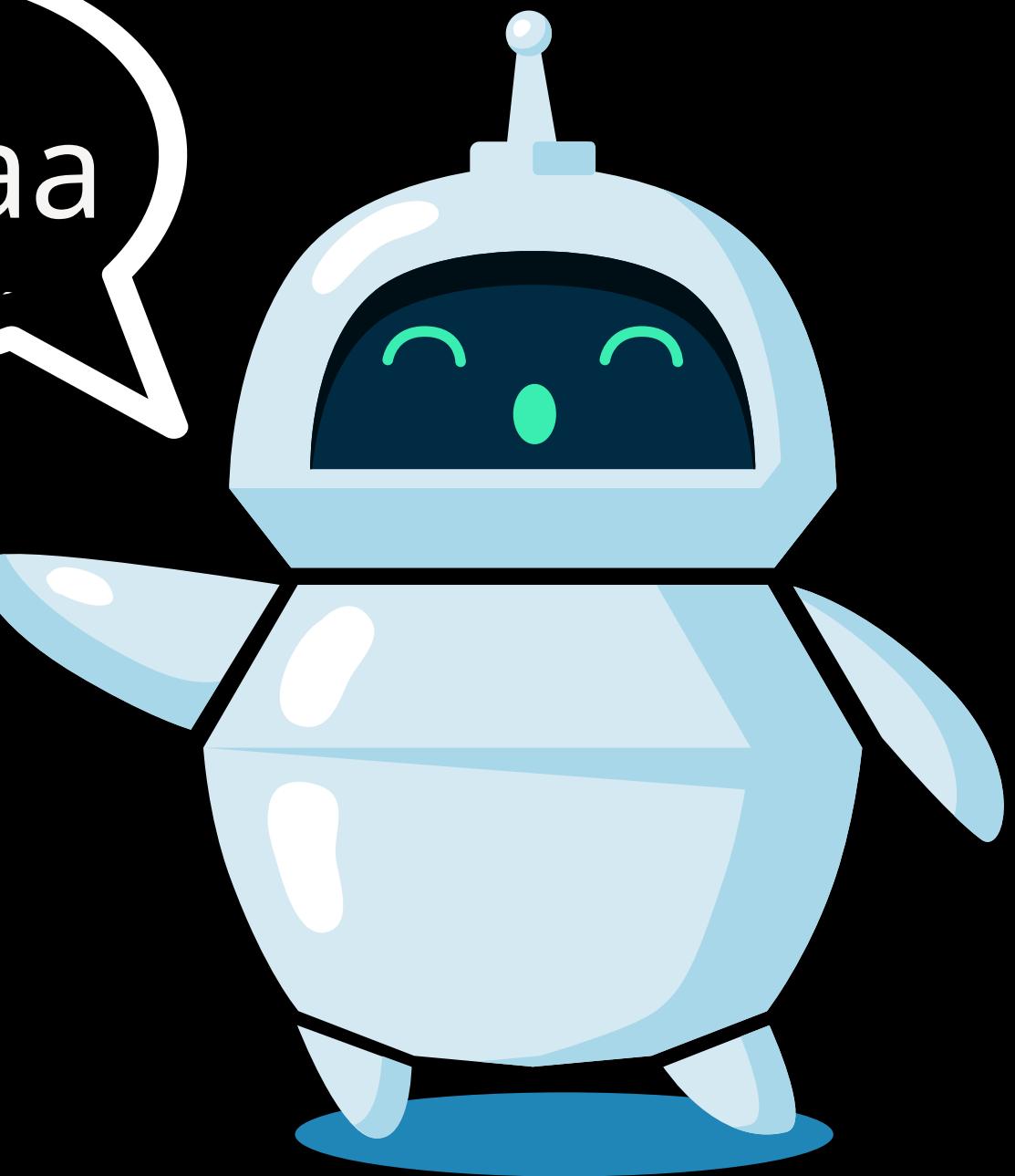
1MI0800061



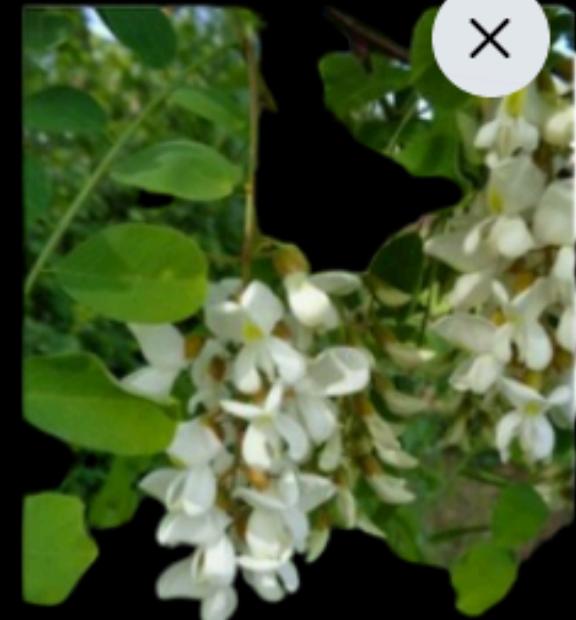
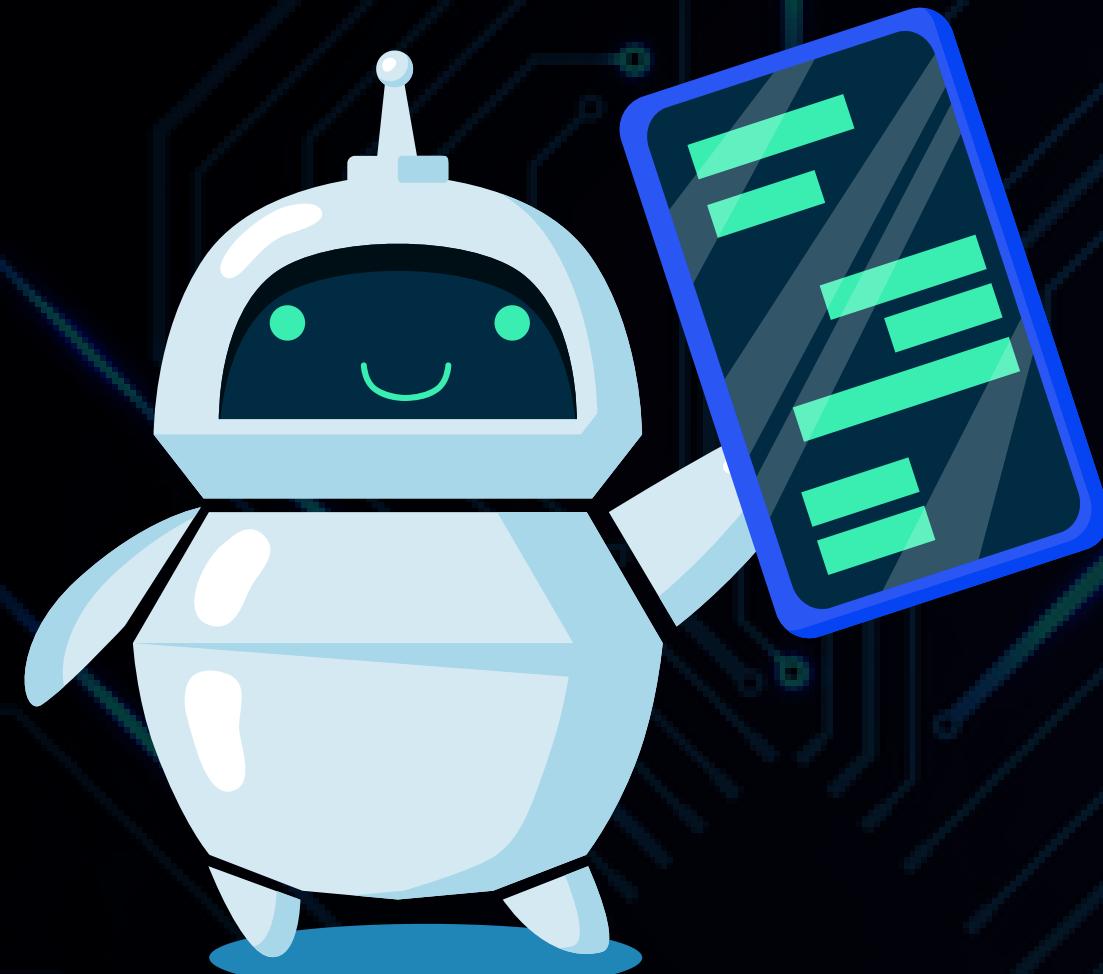
# Разпознаване на Цветя



Тикваа

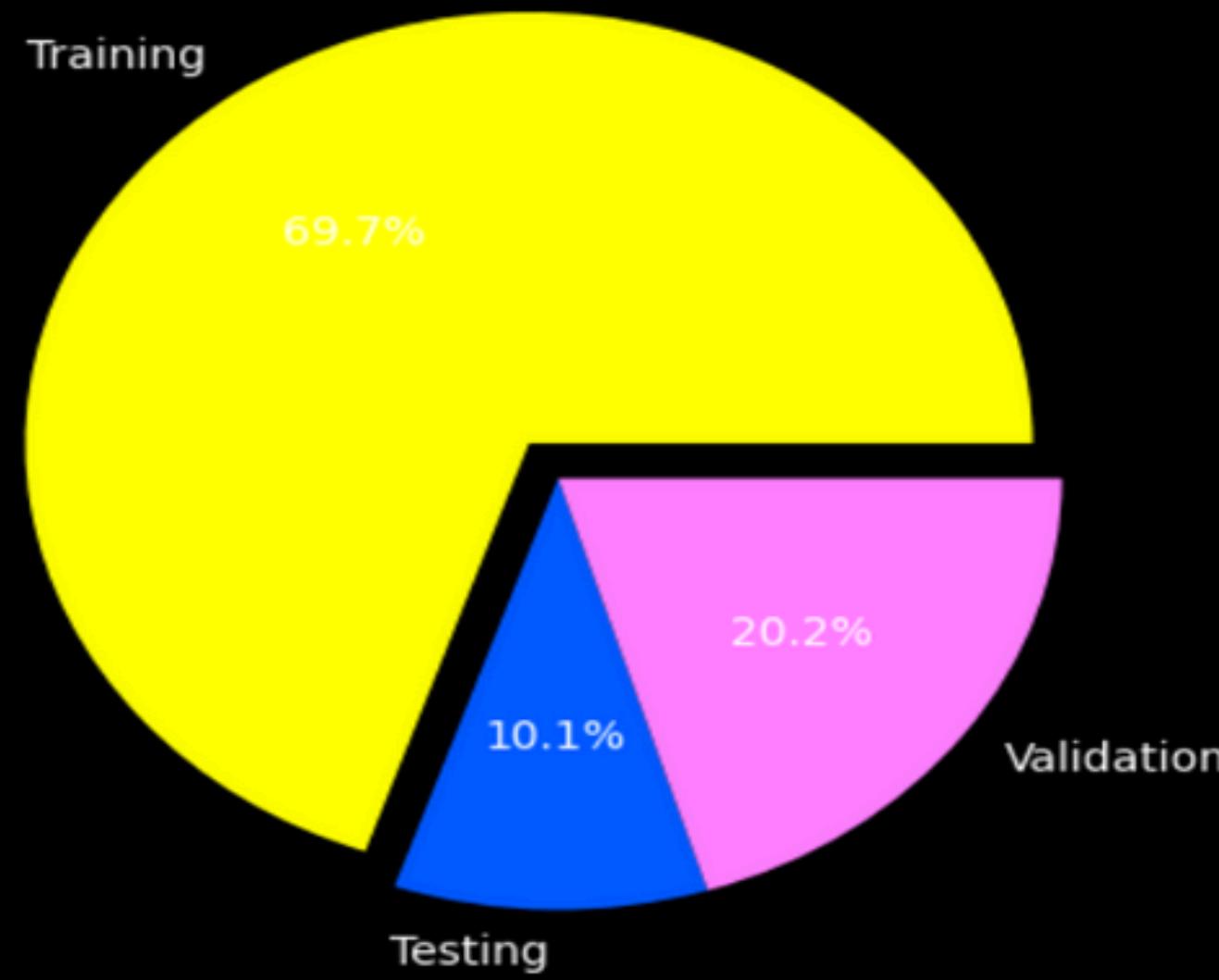


# DATA SET LINK

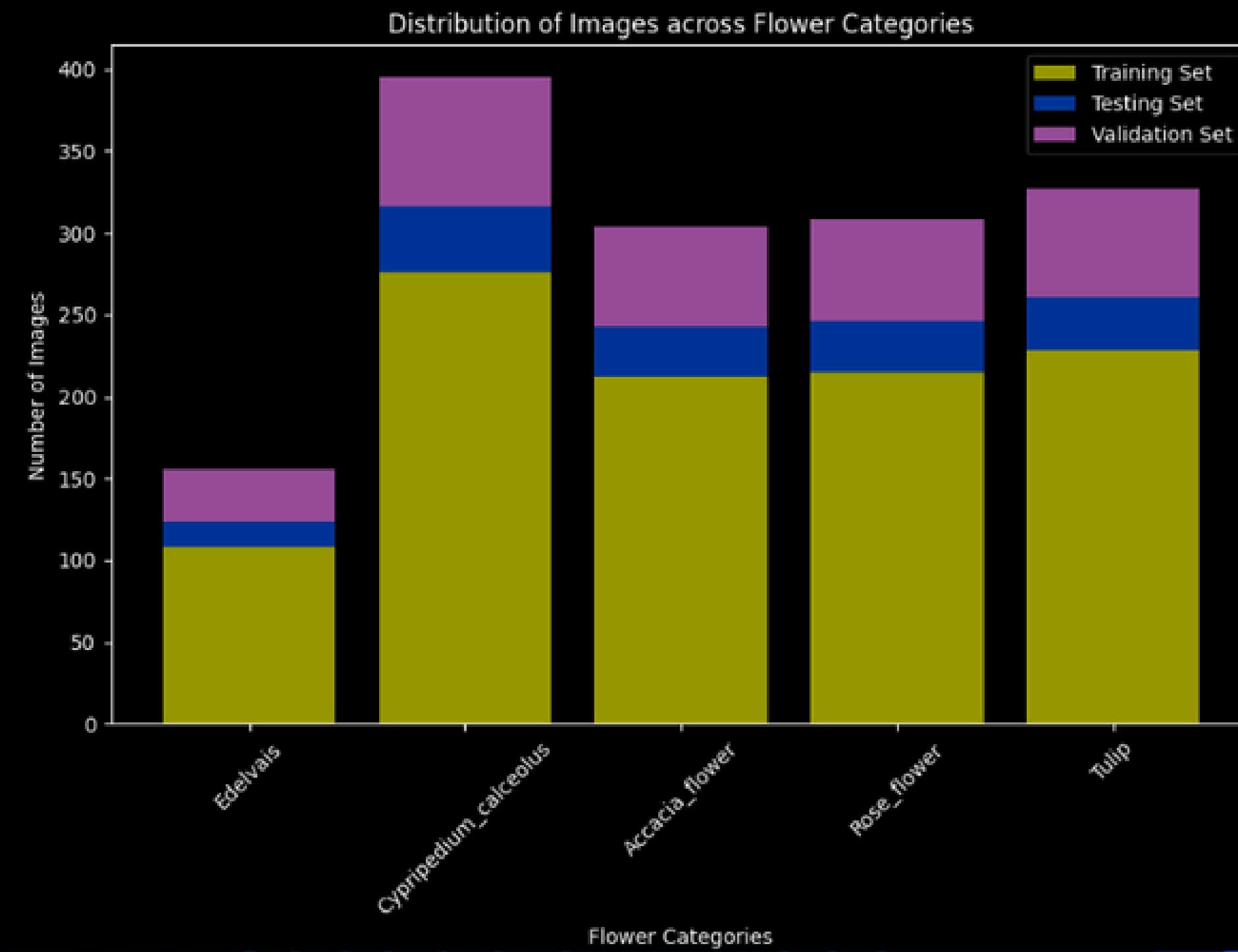


# SEQUENTIAL MODEL

Proportion of Images in Each Set



# SEQUENTIAL MODEL

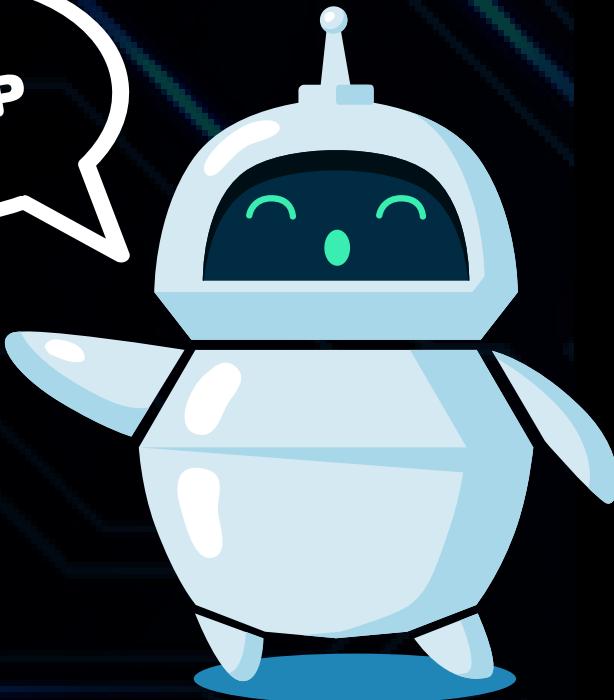


# SERIALIZED MODEL

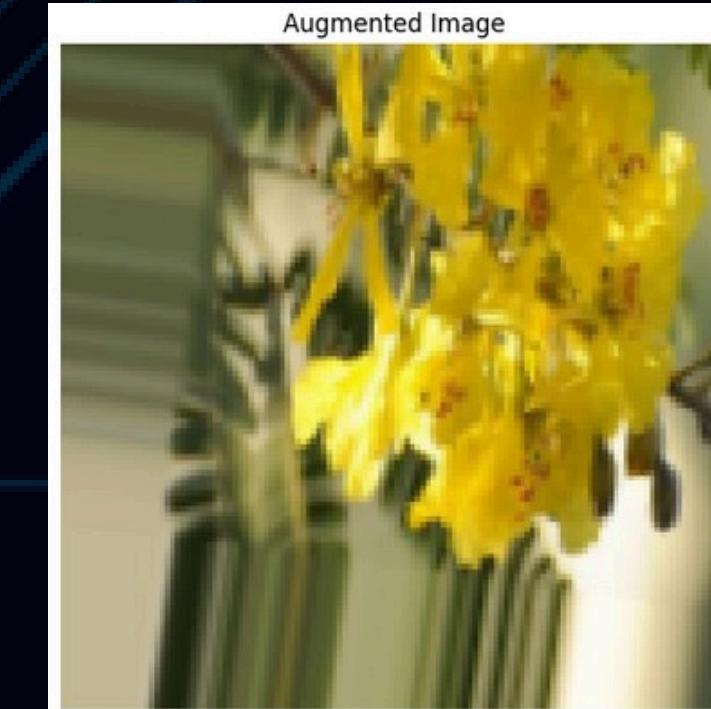
```
Epoch 80/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0037 - val_accuracy: 0.7000 - val_loss: 1.5515
Epoch 81/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0042 - val_accuracy: 0.7200 - val_loss: 1.5651
Epoch 82/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0035 - val_accuracy: 0.7200 - val_loss: 1.5648
Epoch 83/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0037 - val_accuracy: 0.7067 - val_loss: 1.5672
Epoch 84/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0035 - val_accuracy: 0.7200 - val_loss: 1.5721
Epoch 85/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0033 - val_accuracy: 0.7067 - val_loss: 1.5749
Epoch 86/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0032 - val_accuracy: 0.7067 - val_loss: 1.5853
Epoch 87/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0029 - val_accuracy: 0.7133 - val_loss: 1.5789
Epoch 88/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0031 - val_accuracy: 0.7133 - val_loss: 1.6104
Epoch 89/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0027 - val_accuracy: 0.7067 - val_loss: 1.6365
Epoch 90/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0031 - val_accuracy: 0.7133 - val_loss: 1.5915
Epoch 91/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0030 - val_accuracy: 0.7067 - val_loss: 1.6156
Epoch 92/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0026 - val_accuracy: 0.7267 - val_loss: 1.6357
Epoch 93/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0024 - val_accuracy: 0.7200 - val_loss: 1.6110
Epoch 94/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0026 - val_accuracy: 0.7000 - val_loss: 1.6499
Epoch 95/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0027 - val_accuracy: 0.7067 - val_loss: 1.6098
Epoch 96/100
33/33 ━━━━━━ 0s 5ms/step - accuracy: 1.0000 - loss: 0.0026 - val_accuracy: 0.7000 - val_loss: 1.6414
Epoch 97/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0023 - val_accuracy: 0.7067 - val_loss: 1.6551
Epoch 98/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0024 - val_accuracy: 0.6933 - val_loss: 1.6638
Epoch 99/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0021 - val_accuracy: 0.7067 - val_loss: 1.6605
Epoch 100/100
33/33 ━━━━━━ 0s 4ms/step - accuracy: 1.0000 - loss: 0.0020 - val_accuracy: 0.7067 - val_loss: 1.6624
```

overfit

HELP

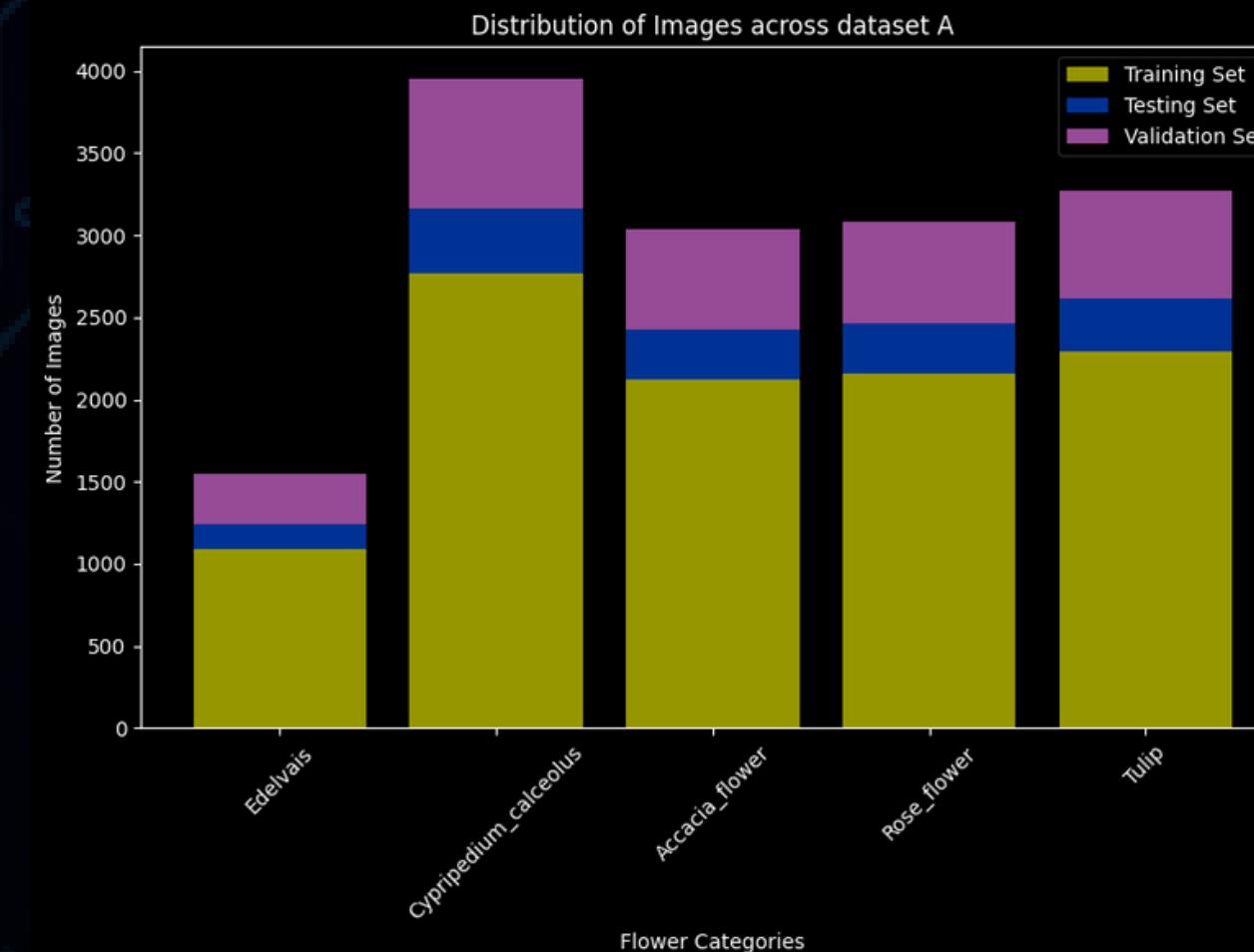


# IMPLEMENTATION



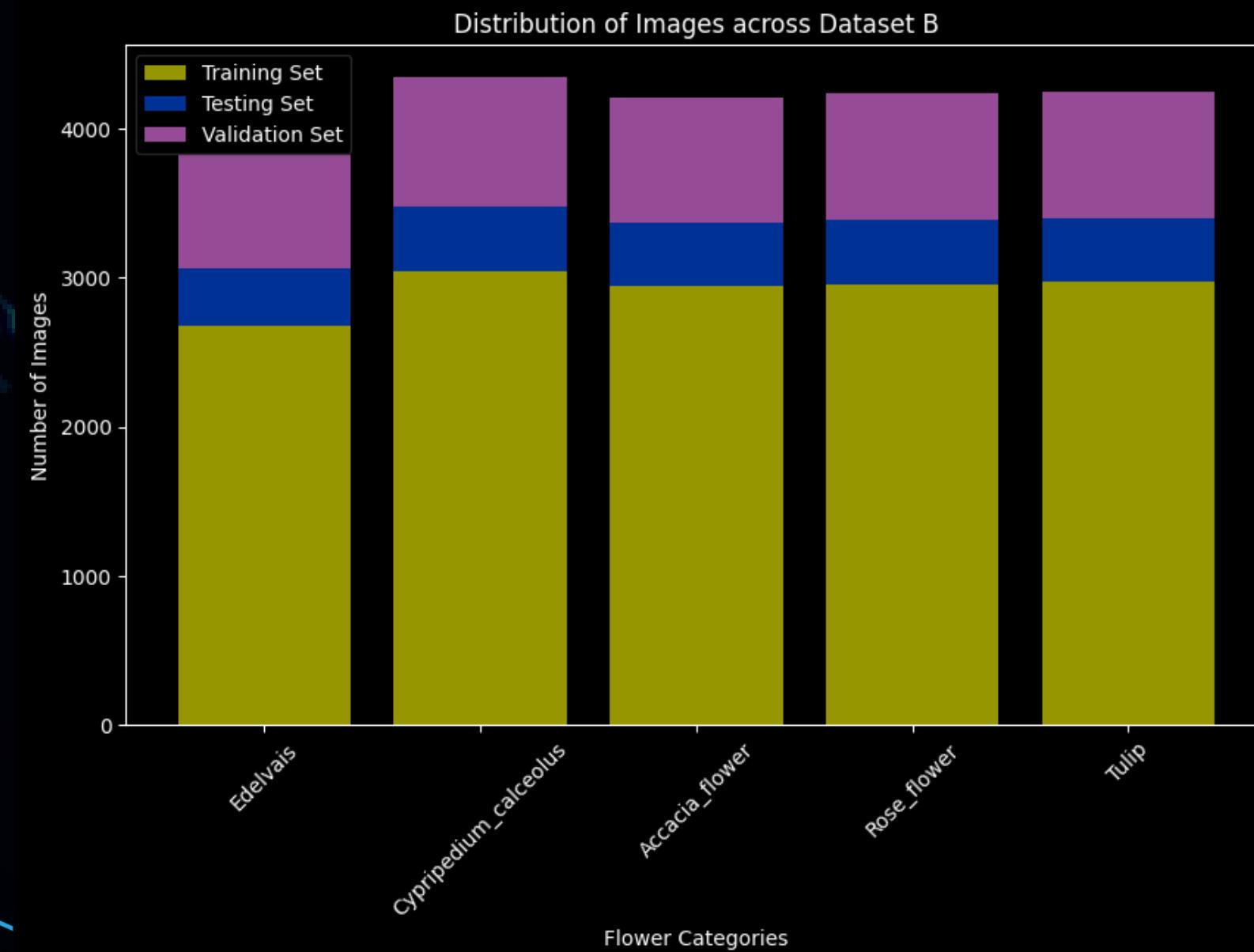
# SEQUENTIAL NEW DATA

```
326/326 ━━━━━━ 1s 4ms/step - accuracy: 0.9352 - loss: 0.1898 - val_accuracy: 0.6741 - val_loss: 1.5865
Epoch 97/100
326/326 ━━━━━━ 1s 4ms/step - accuracy: 0.9529 - loss: 0.1343 - val_accuracy: 0.6801 - val_loss: 1.5696
Epoch 98/100
326/326 ━━━━━━ 1s 4ms/step - accuracy: 0.9474 - loss: 0.1502 - val_accuracy: 0.6855 - val_loss: 1.5825
Epoch 99/100
326/326 ━━━━━━ 1s 4ms/step - accuracy: 0.9465 - loss: 0.1622 - val_accuracy: 0.6660 - val_loss: 1.6530
Epoch 100/100
326/326 ━━━━━━ 1s 4ms/step - accuracy: 0.9455 - loss: 0.1513 - val_accuracy: 0.6788 - val_loss: 1.6468
```



# SEQUENTIAL

457/457 2s 4ms/step - accuracy: 0.9226 - loss: 0.2222 - val\_accuracy: 0.7432 - val\_loss: 1.3270  
Epoch 97/100  
457/457 2s 4ms/step - accuracy: 0.9038 - loss: 0.2815 - val\_accuracy: 0.7537 - val\_loss: 1.2043  
Epoch 98/100  
457/457 2s 4ms/step - accuracy: 0.9459 - loss: 0.1470 - val\_accuracy: 0.7470 - val\_loss: 1.2581  
Epoch 99/100  
457/457 2s 4ms/step - accuracy: 0.9356 - loss: 0.1765 - val\_accuracy: 0.7254 - val\_loss: 1.3261



# SEQUENTIAL-4. 5 LAYERS + EXCEPTIONALAYER

```
Epoch 24/100
457/457 2s 4ms/step - accuracy: 0.9522 - loss: 0.1225 - val_accuracy: 0.7719 - val_loss: 1.1581
Epoch 95/100
457/457 2s 4ms/step - accuracy: 0.9532 - loss: 0.1271 - val_accuracy: 0.7460 - val_loss: 1.3821
Epoch 96/100
457/457 2s 4ms/step - accuracy: 0.9464 - loss: 0.1409 - val_accuracy: 0.7825 - val_loss: 1.0758
Epoch 97/100
457/457 2s 4ms/step - accuracy: 0.9480 - loss: 0.1432 - val_accuracy: 0.7834 - val_loss: 1.1482
Epoch 98/100
457/457 2s 4ms/step - accuracy: 0.9528 - loss: 0.1278 - val_accuracy: 0.7484 - val_loss: 1.3938
Epoch 99/100
457/457 2s 4ms/step - accuracy: 0.9494 - loss: 0.1304 - val_accuracy: 0.7690 - val_loss: 1.1993
Epoch 100/100
457/457 2s 4ms/step - accuracy: 0.9454 - loss: 0.1580 - val_accuracy: 0.7729 - val_loss: 1.1328
```

Best sequential - 77%

# CNN MODEL

Layer (type)	Output Shape	Param #
conv2d_39 (Conv2D)	(None, 126, 126, 32)	896
max_pooling2d_39 (MaxPooling2D)	(None, 63, 63, 32)	0
conv2d_40 (Conv2D)	(None, 61, 61, 64)	18,496
max_pooling2d_40 (MaxPooling2D)	(None, 30, 30, 64)	0
conv2d_41 (Conv2D)	(None, 28, 28, 128)	856
max_pooling2d_41 (MaxPooling2D)	(None, 14, 14, 128)	0
flatten_13 (Flatten)	(None, 18432)	0
dense_23 (Dense)	(None, 512)	12,845,568
dense_24 (Dense)	(None, 5)	2,565

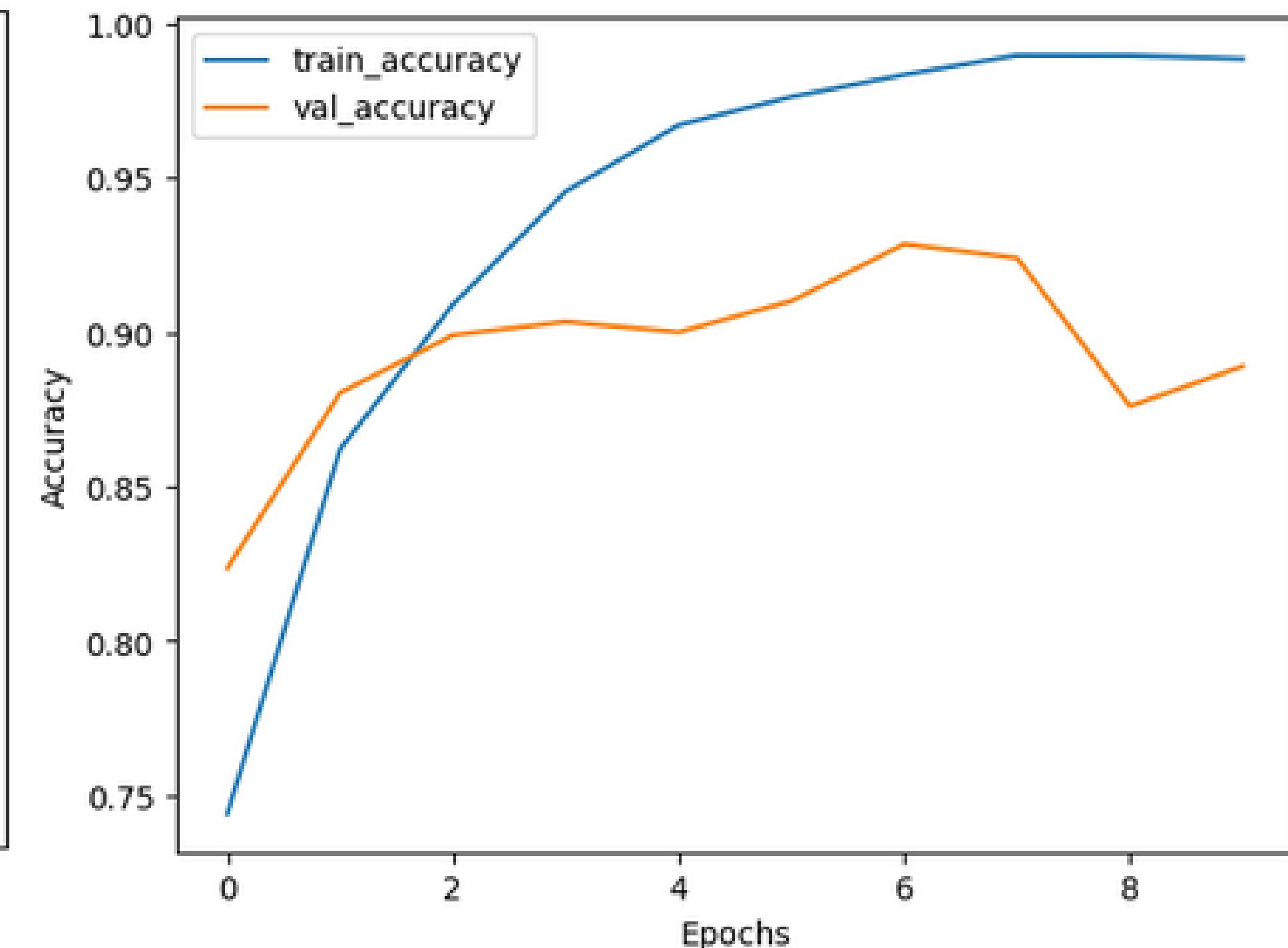
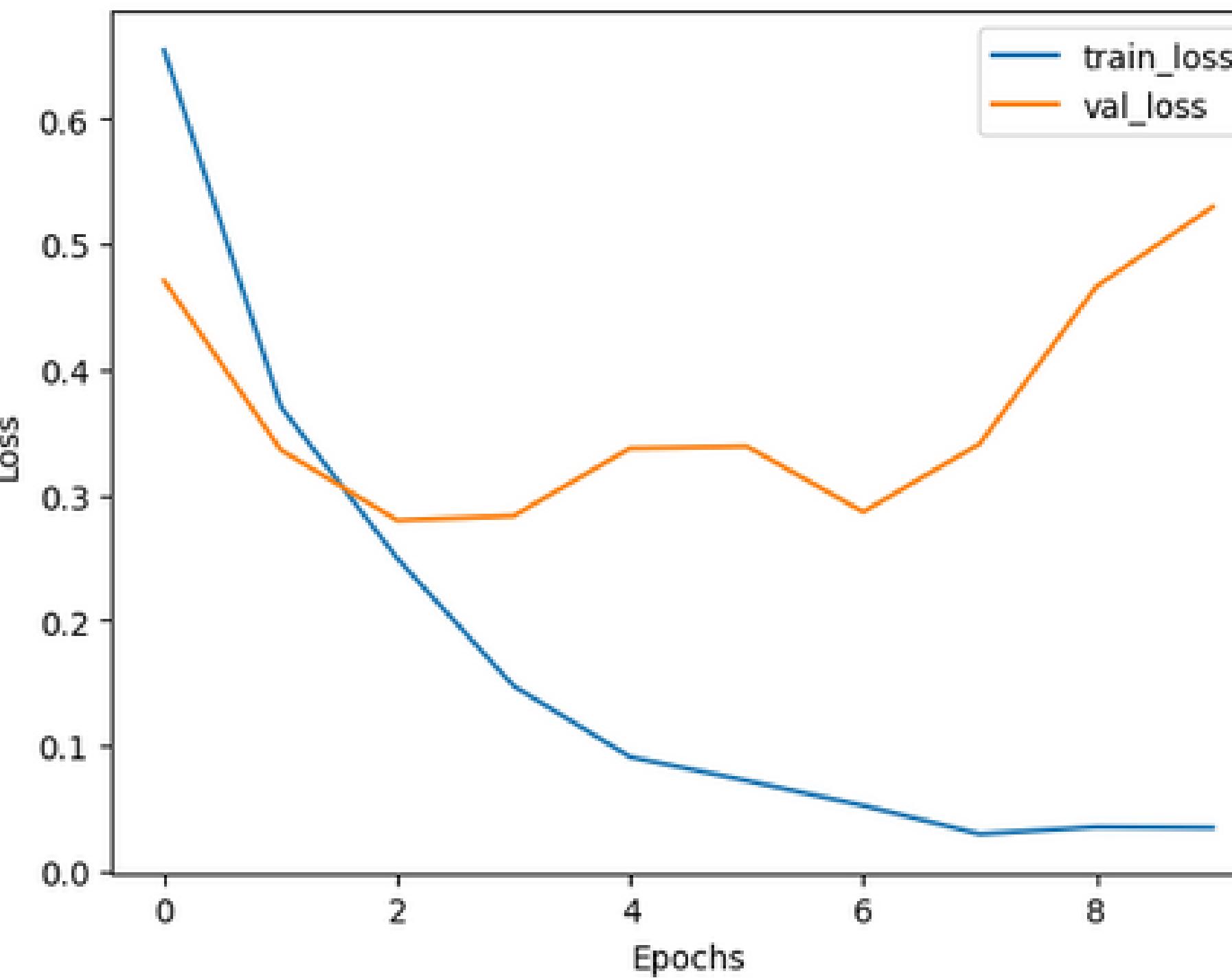
# Data leak

```
Epoch 1/10  
457/457 159s 346ms/step - accuracy: 0.6395 - loss: 0.9003 - val_accuracy: 0.8236 - val_loss: 0.  
4708  
Epoch 2/10  
457/457 158s 346ms/step - accuracy: 0.8503 - loss: 0.3974 - val_accuracy: 0.8804 - val_loss: 0.  
3359  
Epoch 3/10  
457/457 158s 345ms/step - accuracy: 0.9021 - loss: 0.2627 - val_accuracy: 0.8991 - val_loss: 0.  
2797  
Epoch 4/10  
457/457 160s 351ms/step - accuracy: 0.9444 - loss: 0.1495 - val_accuracy: 0.9034 - val_loss: 0.  
2833  
Epoch 5/10  
457/457 158s 346ms/step - accuracy: 0.9558 - loss: 0.0862 - val_accuracy: 0.9001 - val_loss: 0.  
3372  
Epoch 6/10  
457/457 157s 343ms/step - accuracy: 0.9787 - loss: 0.0639 - val_accuracy: 0.9101 - val_loss: 0.  
3387  
Epoch 7/10  
457/457 159s 347ms/step - accuracy: 0.9845 - loss: 0.0464 - val_accuracy: 0.9286 - val_loss: 0.  
2864  
Epoch 8/10  
457/457 160s 349ms/step - accuracy: 0.9945 - loss: 0.0172 - val_accuracy: 0.9240 - val_loss: 0.  
3407  
Epoch 9/10  
457/457 160s 351ms/step - accuracy: 0.9966 - loss: 0.0121 - val_accuracy: 0.8761 - val_loss: 0.  
4661  
Epoch 10/10  
457/457 159s 348ms/step - accuracy: 0.9883 - loss: 0.0380 - val_accuracy: 0.8890 - val_loss: 0.  
5298  
66/66 4s 65ms/step - accuracy: 0.8921 - loss: 0.4718  
Test accuracy: 90.27%
```

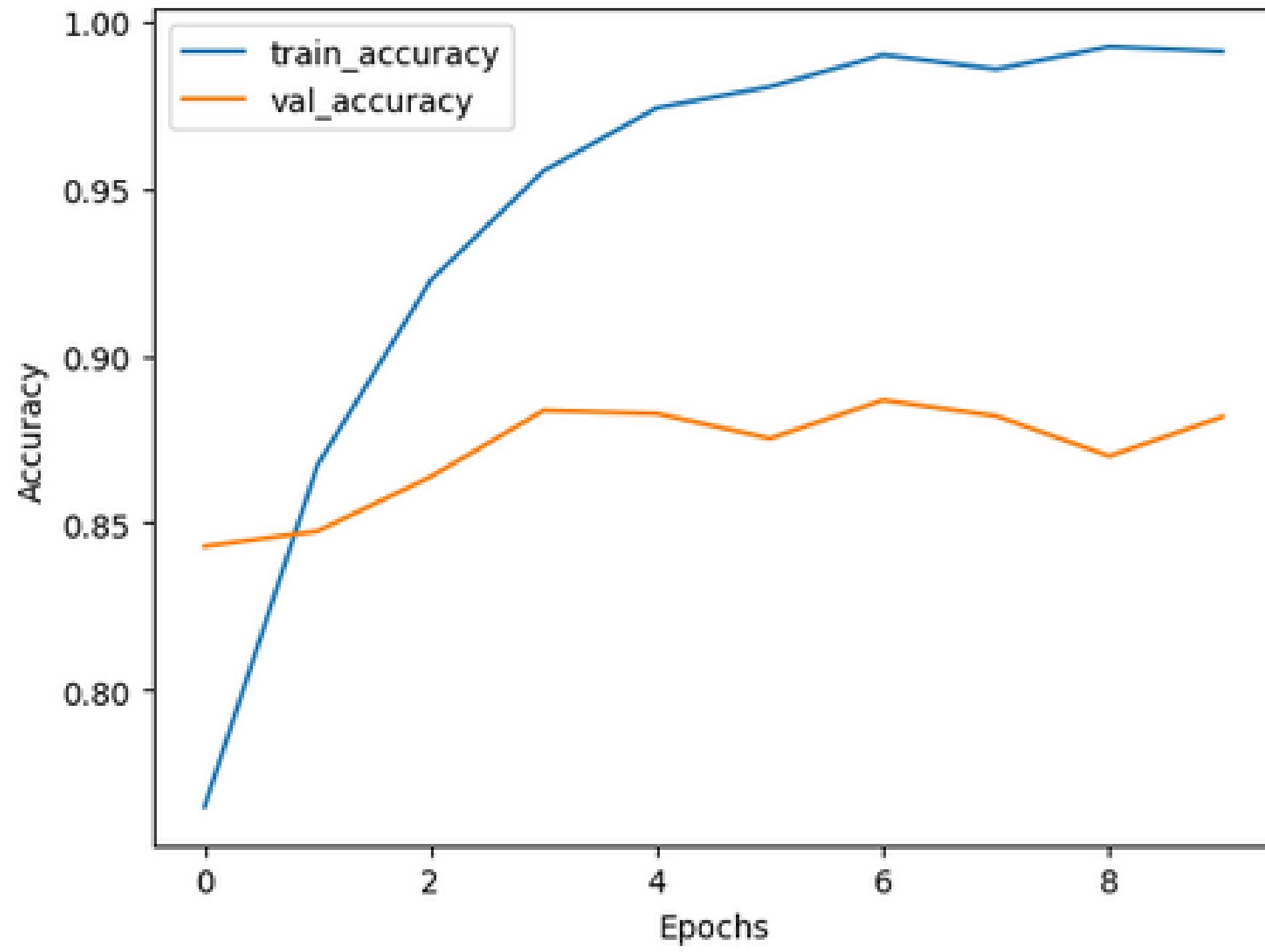
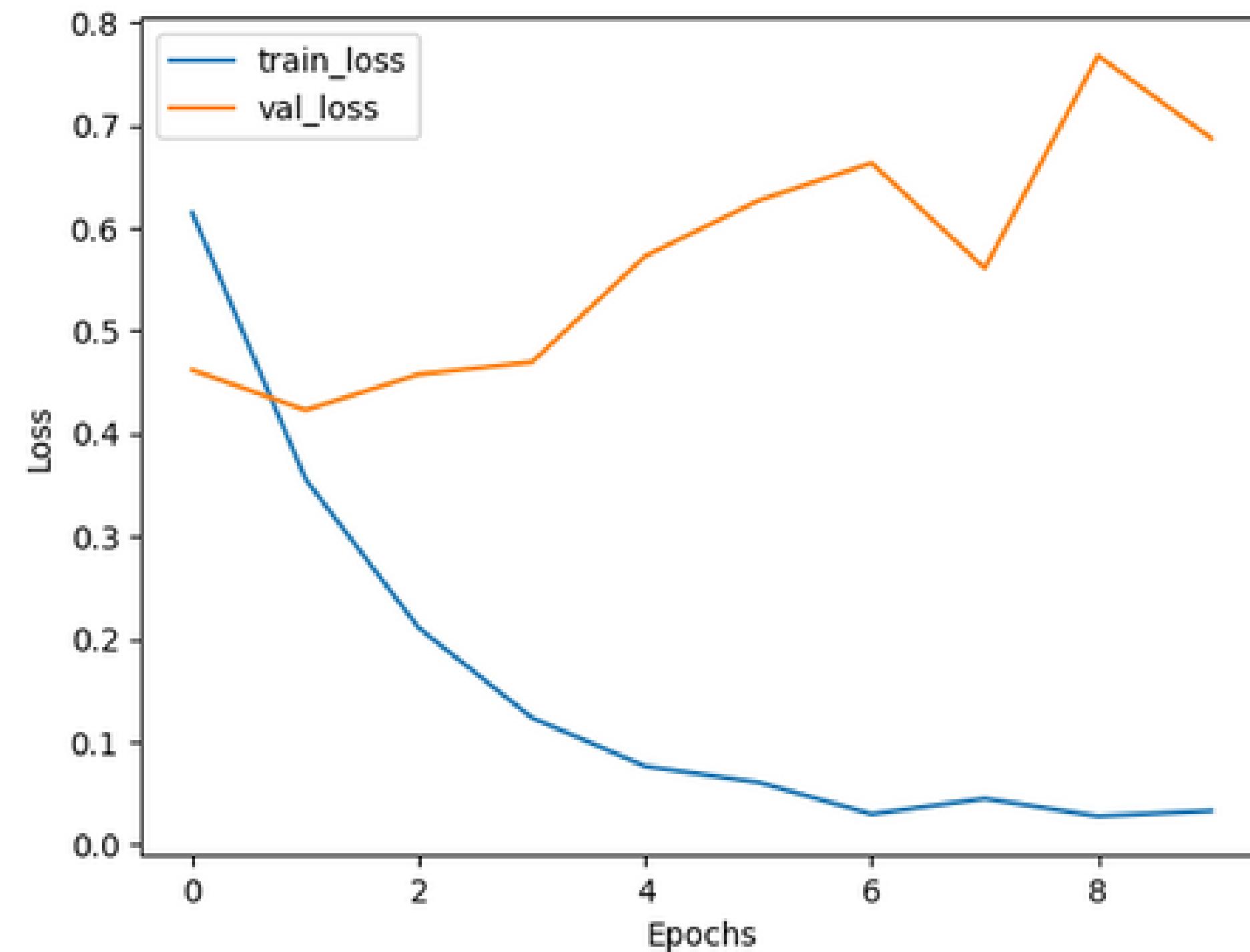
# CNN MODEL NEW DATASET

```
Epoch 1/10
457/457 158s 344ms/step - accuracy: 0.6850 - loss: 0.8196 - val_accuracy: 0.8430 - val_loss: 0.
4617
Epoch 2/10
457/457 156s 341ms/step - accuracy: 0.8586 - loss: 0.3791 - val_accuracy: 0.8476 - val_loss: 0.
4227
Epoch 3/10
457/457 158s 346ms/step - accuracy: 0.9193 - loss: 0.2208 - val_accuracy: 0.8638 - val_loss: 0.
4575
Epoch 4/10
457/457 159s 347ms/step - accuracy: 0.9533 - loss: 0.1312 - val_accuracy: 0.8837 - val_loss: 0.
4693
Epoch 5/10
457/457 157s 344ms/step - accuracy: 0.9777 - loss: 0.0662 - val_accuracy: 0.8827 - val_loss: 0.
5726
Epoch 6/10
457/457 159s 347ms/step - accuracy: 0.9871 - loss: 0.0441 - val_accuracy: 0.8753 - val_loss: 0.
6267
Epoch 7/10
457/457 155s 340ms/step - accuracy: 0.9910 - loss: 0.0273 - val_accuracy: 0.8868 - val_loss: 0.
6634
Epoch 8/10
457/457 157s 344ms/step - accuracy: 0.9925 - loss: 0.0249 - val_accuracy: 0.8820 - val_loss: 0.
5608
Epoch 9/10
457/457 156s 342ms/step - accuracy: 0.9918 - loss: 0.0270 - val_accuracy: 0.8700 - val_loss: 0.
7678
Epoch 10/10
457/457 156s 342ms/step - accuracy: 0.9949 - loss: 0.0171 - val_accuracy: 0.8817 - val_loss: 0.
6873
66/66 4s 64ms/step - accuracy: 0.8073 - loss: 1.1088
Test accuracy: 81.13%
```

# CNN MODEL CLASSIFICATION



# CNN MODEL NEW DATA



#1

Victory Royale!

# HUGE SUCCESS

81% > 66%

