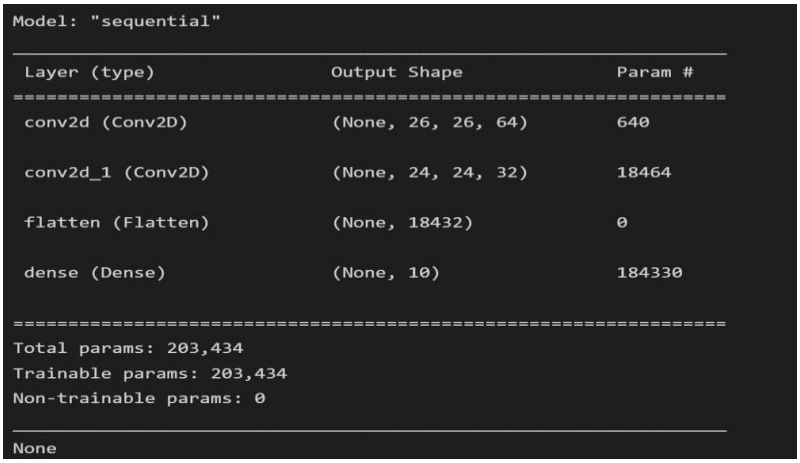
PROJECT DEVELOPMENT
PHASE
MODEL PERFORMANCE TEST

Date	10 November 2022
Team ID	PNT2022TMID39636
Project Name	Project –A Novel Handwritten Digit recognition System
Maximum Marks	10 Marks

MODEL PERFORMANCE TESTING:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	Handwritten Digit Recognition is use to Recognize the handwritten Digit.	

```
Model: "sequential"
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 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 26, 26, 64)        640

 conv2d_1 (Conv2D)           (None, 24, 24, 32)        18464

 flatten (Flatten)           (None, 18432)             0

 dense (Dense)               (None, 10)                184330

=================================================================
Total params: 203,434
Trainable params: 203,434
Non-trainable params: 0
_________________________________________________________________
None
```

2.	Accuracy	Training Accuracy - 99.4% Validation Accuracy - 97.7%	▾ Train the model `[ ] model.fit(x_train, y_train, validation_data=(x_test, y_test), epochs=5, batch_size=32)` Epoch 1/5 1875/1875 [==========] - 189s 101ms/step - loss: 0.2617 - accuracy: 0.9476 - val_loss: 0.0952 - val_accuracy: 0.9728 Epoch 2/5 1875/1875 [==========] - 182s 97ms/step - loss: 0.0720 - accuracy: 0.9783 - val_loss: 0.0830 - val_accuracy: 0.9750 Epoch 3/5 1875/1875 [==========] - 180s 96ms/step - loss: 0.0510 - accuracy: 0.9846 - val_loss: 0.0832 - val_accuracy: 0.9766 Epoch 4/5 1875/1875 [==========] - 181s 97ms/step - loss: 0.0412 - accuracy: 0.9873 - val_loss: 0.0857 - val_accuracy: 0.9772 Epoch 5/5 1875/1875 [==========] - 179s 96ms/step - loss: 0.0303 - accuracy: 0.9904 - val_loss: 0.1200 - val_accuracy: 0.9760 <keras.callbacks.History at 0x7fbcca75b910>
3.	Confidence Score (Only Yolo Projects)	Confidence Score (Only Yolo Projects)	$$b_x = \sigma(t_x) + c_x$$ $$b_y = \sigma(t_y) + c_y$$ $$b_w = p_w e^{t_w}$$ $$b_h = p_h e^{t_h}$$ $$Pr(\text{object}) * IOU(b, \text{object}) = \sigma(t_o)$$ where t_x, t_y, t_w, t_h are predictions made by YOLO. c_x, c_y is the top left corner of the grid cell of the anchor. p_w, p_h are the width and height of the anchor. c_x, c_y, p_w, p_h are normalized by the image width and height. b_x, b_y, b_w, b_h are the predicted boundary box. $\sigma(t_o)$ is the box confidence score.