

Project Development Phase
Model Performance Test

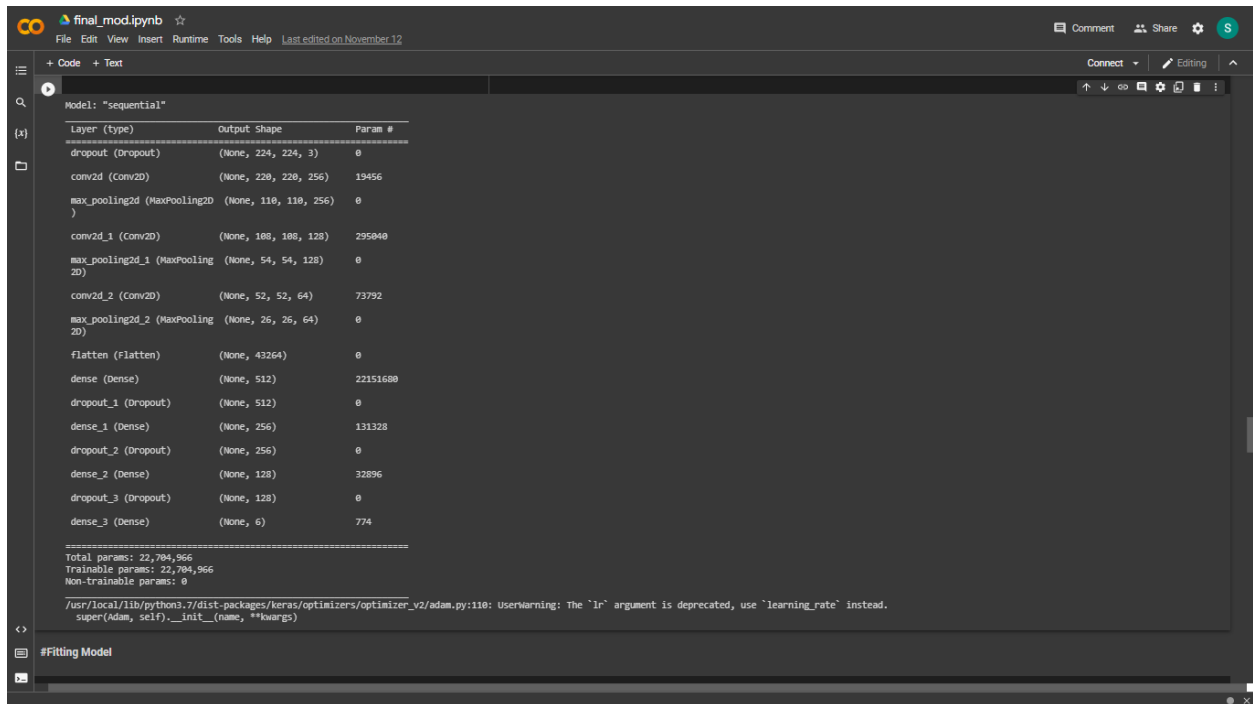
| | |
|---------------|---|
| Date | 17 November 2022 |
| Team ID | PNT2022TMID00699 |
| Project Name | Project - Digital Naturalist – AI Enabled tool for Biodiversity Researchers |
| Maximum Marks | 10 Marks |

Model Performance Testing:

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

| S. No | Parameter | Values | Screenshot |
|-------|---------------|--|--------------|
| 1. | Model Summary | Total params: 22,704,966 Trainable params: 22,704,966 Non-trainable params: 0 | Screenshot 1 |
| 2. | Accuracy | Training Accuracy - 92.73% Validation Accuracy – 80.73% | Screenshot 2 |

SCREENSHOT 1:



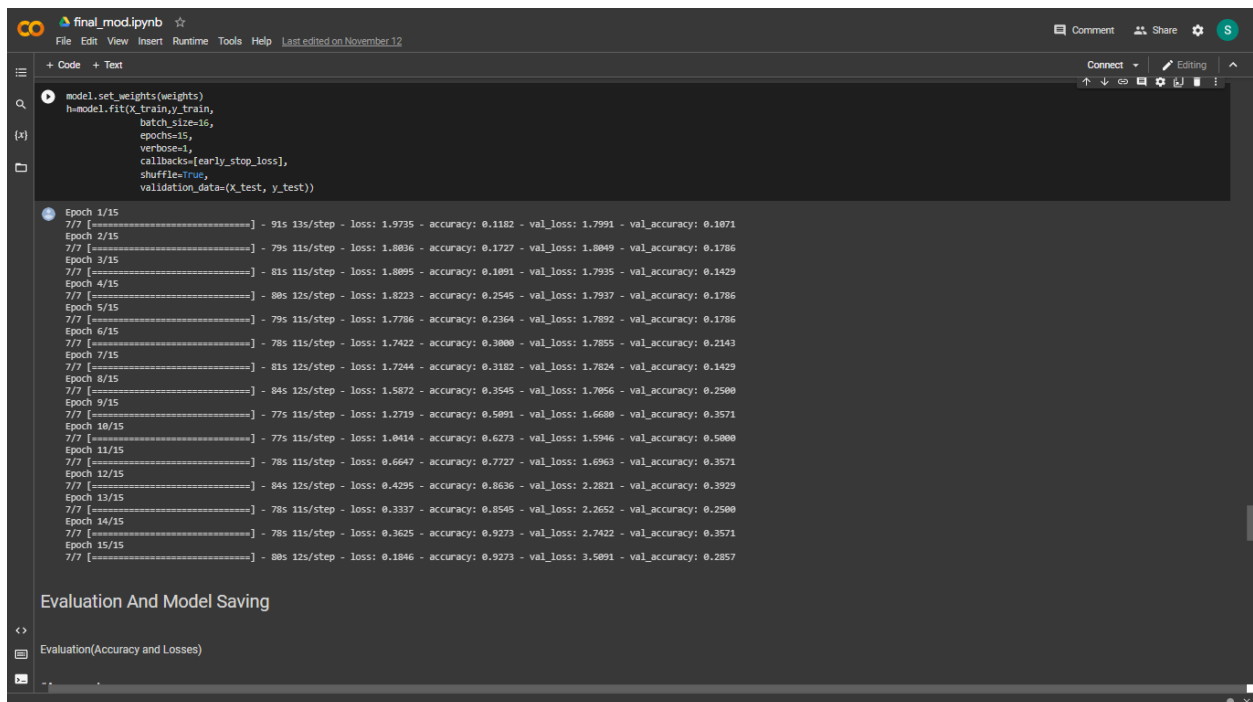
The screenshot shows a Jupyter Notebook interface with a file named 'final_mod.ipynb'. The notebook is open to a cell containing a Keras sequential model summary. The model is named 'sequential' and consists of the following layers:

| Layer (type) | Output Shape | Param # |
|--------------------------------|-----------------------|----------|
| dropout (Dropout) | (None, 224, 224, 3) | 0 |
| conv2d (Conv2D) | (None, 220, 220, 256) | 19456 |
| max_pooling2d (MaxPooling2D) | (None, 110, 110, 256) | 0 |
| conv2d_1 (Conv2D) | (None, 108, 108, 128) | 295040 |
| max_pooling2d_1 (MaxPooling2D) | (None, 54, 54, 128) | 0 |
| conv2d_2 (Conv2D) | (None, 52, 52, 64) | 73792 |
| max_pooling2d_2 (MaxPooling2D) | (None, 26, 26, 64) | 0 |
| Flatten (Flatten) | (None, 43264) | 0 |
| dense (Dense) | (None, 512) | 22151600 |
| dropout_1 (Dropout) | (None, 512) | 0 |
| dense_1 (Dense) | (None, 256) | 131328 |
| dropout_2 (Dropout) | (None, 256) | 0 |
| dense_2 (Dense) | (None, 128) | 32896 |
| dropout_3 (Dropout) | (None, 128) | 0 |
| dense_3 (Dense) | (None, 6) | 774 |

Total params: 22,704,966
Trainable params: 22,704,966
Non-trainable params: 0

A warning message is displayed at the bottom of the cell: `/usr/local/lib/python3.7/dist-packages/keras/optimizers/optimizer_v2/adam.py:110: UserWarning: The 'lr' argument is deprecated, use 'learning_rate' instead.`

SCREENSHOT 2:



The screenshot shows a Jupyter Notebook interface with a file named 'final_mod.ipynb'. The notebook is open to a cell containing code for training and evaluating a model. The code is as follows:

```
model.set_weights(weights)
h=model.fit(X_train,y_train,
           batch_size=16,
           epochs=15,
           verbose=1,
           callbacks=[early_stop_loss],
           shuffle=True,
           validation_data=(X_test, y_test))
```

The output of the code shows the training progress for 15 epochs. The progress bar for each epoch is shown as a series of equals signs followed by the number of steps completed. The output for each epoch is as follows:

| Epoch | Steps | Loss | Accuracy | Val Loss | Val Accuracy |
|-------------|--------------|--------|----------|----------|--------------|
| Epoch 1/15 | 91s 13s/step | 1.9735 | 0.1182 | 1.7991 | 0.1071 |
| Epoch 2/15 | 79s 11s/step | 1.8036 | 0.1727 | 1.8049 | 0.1786 |
| Epoch 3/15 | 81s 11s/step | 1.8095 | 0.1891 | 1.7935 | 0.1429 |
| Epoch 4/15 | 80s 12s/step | 1.8223 | 0.2545 | 1.7937 | 0.1786 |
| Epoch 5/15 | 79s 11s/step | 1.7786 | 0.2364 | 1.7892 | 0.1786 |
| Epoch 6/15 | 78s 11s/step | 1.7422 | 0.3000 | 1.7855 | 0.2143 |
| Epoch 7/15 | 81s 12s/step | 1.7244 | 0.3182 | 1.7824 | 0.1429 |
| Epoch 8/15 | 84s 12s/step | 1.5872 | 0.3545 | 1.7056 | 0.2500 |
| Epoch 9/15 | 77s 11s/step | 1.2719 | 0.5891 | 1.6680 | 0.3571 |
| Epoch 10/15 | 77s 11s/step | 1.0414 | 0.6273 | 1.5946 | 0.5000 |
| Epoch 11/15 | 78s 11s/step | 0.6647 | 0.7727 | 1.6963 | 0.3571 |
| Epoch 12/15 | 84s 12s/step | 0.4295 | 0.8636 | 2.2821 | 0.3929 |
| Epoch 13/15 | 78s 11s/step | 0.3337 | 0.8545 | 2.2652 | 0.2500 |
| Epoch 14/15 | 78s 11s/step | 0.3625 | 0.9273 | 2.7422 | 0.3571 |
| Epoch 15/15 | 80s 12s/step | 0.1046 | 0.9273 | 3.5091 | 0.2857 |

The notebook is open to a cell titled 'Evaluation And Model Saving'. The cell contains the following code:

```
Evaluation(Accuracy and Losses)
```