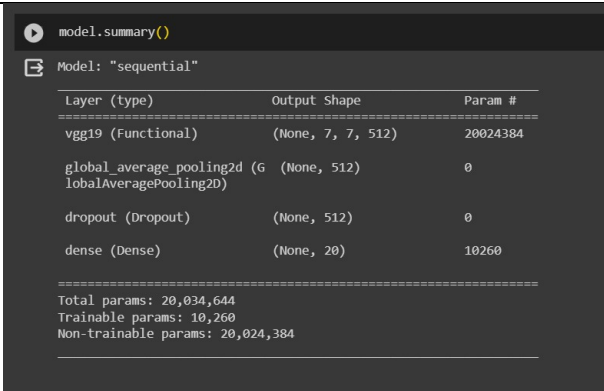
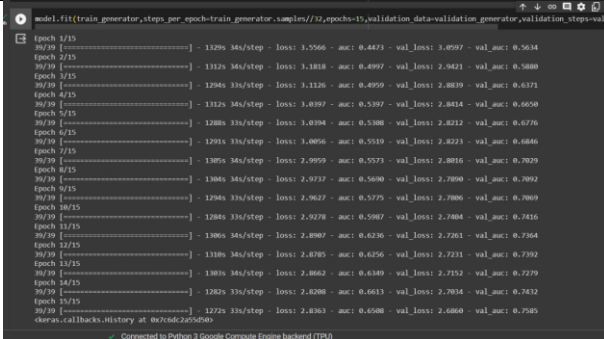


Project Development Phase Model Performance Test

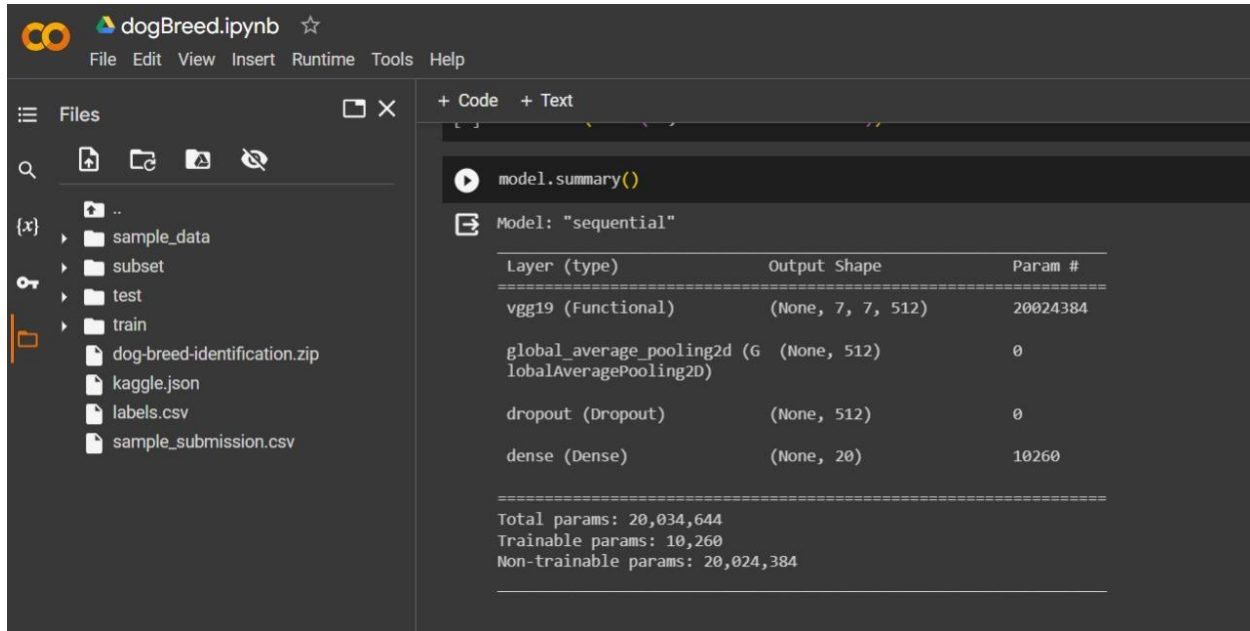
Date	17 November 2023
Team ID	Team-592393
Project Name	Dog Breed Identification using Transfer Learning
Maximum Marks	10 Marks

Model Performance Testing:

S.No.	Parameter	Values	Screenshot
1.	Model Summary	Total Parameters: 2,00,34,644 Trainable Parameters: 10,260 Non-Trainable Parameters: 2,00,24,384	 <pre> model.summary() Model: "sequential" Layer (type) Output Shape Param # ----- vgg19 (Functional) (None, 7, 7, 512) 20024384 global_average_pooling2d (G (None, 512) 0 lobalAveragePooling2D) dropout (Dropout) (None, 512) 0 dense (Dense) (None, 20) 10260 Total params: 20,034,644 Trainable params: 10,260 Non-trainable params: 20,024,384 </pre>
2.	Accuracy	Training Accuracy - 65.08 Validation Accuracy – 75.85	 <pre> model.fit(train_generator, steps_per_epoch=train_generator.samples//32, epochs=15, validation_data=validation_generator, validation_steps=validation_generator.samples//32) Epoch 1/15: 13290 34s/step - loss: 3.5566 - auc: 0.4473 - val_loss: 3.0597 - val_auc: 0.5634 Epoch 2/15: 13129 34s/step - loss: 3.1818 - auc: 0.4997 - val_loss: 2.9421 - val_auc: 0.5880 Epoch 3/15: 12940 33s/step - loss: 3.1126 - auc: 0.4959 - val_loss: 2.8819 - val_auc: 0.6371 Epoch 4/15: 13128 34s/step - loss: 3.0397 - auc: 0.5397 - val_loss: 2.8414 - val_auc: 0.6650 Epoch 5/15: 12885 33s/step - loss: 3.0194 - auc: 0.5388 - val_loss: 2.8212 - val_auc: 0.6776 Epoch 6/15: 12915 33s/step - loss: 3.0056 - auc: 0.5510 - val_loss: 2.8223 - val_auc: 0.6886 Epoch 7/15: 13054 34s/step - loss: 2.9959 - auc: 0.5573 - val_loss: 2.8016 - val_auc: 0.7029 Epoch 8/15: 13045 34s/step - loss: 2.9737 - auc: 0.5690 - val_loss: 2.7909 - val_auc: 0.7092 Epoch 9/15: 12945 33s/step - loss: 2.9627 - auc: 0.5775 - val_loss: 2.7806 - val_auc: 0.7089 Epoch 10/15: 12845 33s/step - loss: 2.9278 - auc: 0.5987 - val_loss: 2.7484 - val_auc: 0.7416 Epoch 11/15: 13064 34s/step - loss: 2.8987 - auc: 0.6236 - val_loss: 2.7261 - val_auc: 0.7364 Epoch 12/15: 13189 34s/step - loss: 2.8785 - auc: 0.6256 - val_loss: 2.7231 - val_auc: 0.7392 Epoch 13/15: 13015 34s/step - loss: 2.8662 - auc: 0.6349 - val_loss: 2.7152 - val_auc: 0.7279 Epoch 14/15: 12870 33s/step - loss: 2.8288 - auc: 0.6613 - val_loss: 2.7034 - val_auc: 0.7432 Epoch 15/15: 12720 32s/step - loss: 2.8303 - auc: 0.6588 - val_loss: 2.6860 - val_auc: 0.7349 keras.callbacks.History at 0x7cde2d5c5d09 </pre>

Screenshot:

Model Summary



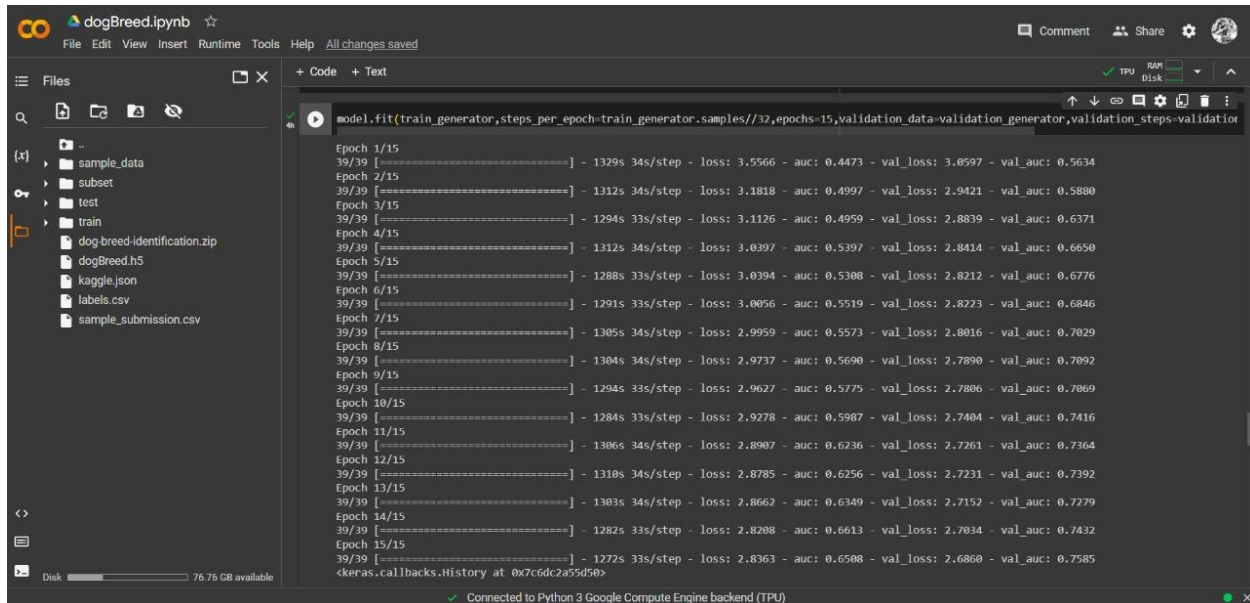
The screenshot shows a Jupyter Notebook interface with a file explorer on the left and a code editor on the right. The file explorer displays a directory structure with files like `sample_data`, `subset`, `test`, `train`, `dog-breed-identification.zip`, `kaggle.json`, `labels.csv`, and `sample_submission.csv`. The code editor shows the execution of `model.summary()`, which outputs a summary of the model's architecture.

Model: "sequential"

Layer (type)	Output Shape	Param #
vgg19 (Functional)	(None, 7, 7, 512)	20024384
global_average_pooling2d (GlobalAveragePooling2D)	(None, 512)	0
dropout (Dropout)	(None, 512)	0
dense (Dense)	(None, 20)	10260

Total params: 20,034,644
Trainable params: 10,260
Non-trainable params: 20,024,384

Model Accuracy



The screenshot shows the same Jupyter Notebook interface, but now displaying the output of `model.fit()`. The output shows the training progress over 15 epochs, including loss and accuracy metrics for both training and validation data. The model is connected to a Python 3 Google Compute Engine backend (TPU).

model.fit(train_generator, steps_per_epoch=train_generator.samples//32, epochs=15, validation_data=validation_generator, validation_steps=validation_generator.samples//32)

Epoch 1/15
39/39 [=====] - 1329s 34s/step - loss: 3.5566 - auc: 0.4473 - val_loss: 3.0597 - val_auc: 0.5634
Epoch 2/15
39/39 [=====] - 1312s 34s/step - loss: 3.1818 - auc: 0.4997 - val_loss: 2.9421 - val_auc: 0.5880
Epoch 3/15
39/39 [=====] - 1294s 33s/step - loss: 3.1126 - auc: 0.4959 - val_loss: 2.8839 - val_auc: 0.6371
Epoch 4/15
39/39 [=====] - 1312s 34s/step - loss: 3.0397 - auc: 0.5397 - val_loss: 2.8414 - val_auc: 0.6650
Epoch 5/15
39/39 [=====] - 1288s 33s/step - loss: 3.0394 - auc: 0.5308 - val_loss: 2.8212 - val_auc: 0.6776
Epoch 6/15
39/39 [=====] - 1291s 33s/step - loss: 3.0056 - auc: 0.5519 - val_loss: 2.8223 - val_auc: 0.6846
Epoch 7/15
39/39 [=====] - 1305s 34s/step - loss: 2.9959 - auc: 0.5573 - val_loss: 2.8016 - val_auc: 0.7029
Epoch 8/15
39/39 [=====] - 1304s 34s/step - loss: 2.9737 - auc: 0.5690 - val_loss: 2.7890 - val_auc: 0.7092
Epoch 9/15
39/39 [=====] - 1294s 33s/step - loss: 2.9627 - auc: 0.5775 - val_loss: 2.7806 - val_auc: 0.7069
Epoch 10/15
39/39 [=====] - 1284s 33s/step - loss: 2.9278 - auc: 0.5987 - val_loss: 2.7404 - val_auc: 0.7416
Epoch 11/15
39/39 [=====] - 1306s 34s/step - loss: 2.8907 - auc: 0.6236 - val_loss: 2.7261 - val_auc: 0.7364
Epoch 12/15
39/39 [=====] - 1310s 34s/step - loss: 2.8785 - auc: 0.6256 - val_loss: 2.7231 - val_auc: 0.7392
Epoch 13/15
39/39 [=====] - 1303s 34s/step - loss: 2.8662 - auc: 0.6349 - val_loss: 2.7152 - val_auc: 0.7279
Epoch 14/15
39/39 [=====] - 1282s 33s/step - loss: 2.8208 - auc: 0.6613 - val_loss: 2.7034 - val_auc: 0.7432
Epoch 15/15
39/39 [=====] - 1272s 33s/step - loss: 2.8363 - auc: 0.6588 - val_loss: 2.6860 - val_auc: 0.7585
keras.callbacks.History at 0xc7c6dc2a55d5b0

Connected to Python 3 Google Compute Engine backend (TPU)