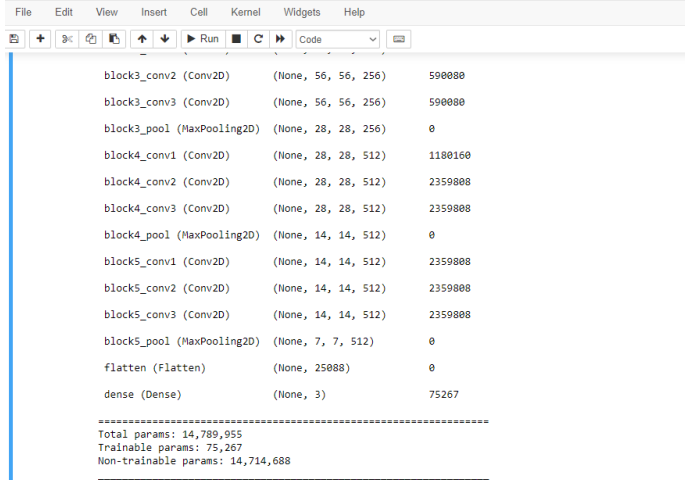
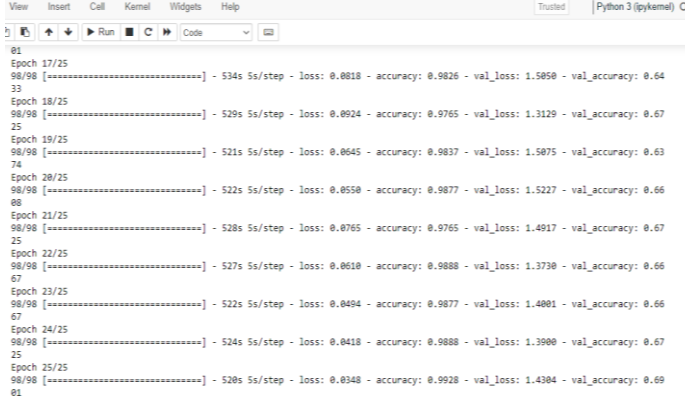


Project Development Phase Model Performance Test

Date	10 November 2022
Team ID	PNT2022TMID01378
Project Name	Project - Intelligent Vehicle Damage Assessment & Cost Estimator for Insurance Companies
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: 14,789,955 Trainable params: 75,267 Non-trainable params: 14,714,688	 <pre> File Edit View Insert Cell Kernel Widgets Help + - 9: + - Run [] Code block3_conv2 (Conv2D) (None, 56, 56, 256) 590080 block3_conv3 (Conv2D) (None, 56, 56, 256) 590080 block3_pool (MaxPooling2D) (None, 28, 28, 256) 0 block4_conv1 (Conv2D) (None, 28, 28, 512) 1180160 block4_conv2 (Conv2D) (None, 28, 28, 512) 2359008 block4_conv3 (Conv2D) (None, 28, 28, 512) 2359008 block4_pool (MaxPooling2D) (None, 14, 14, 512) 0 block5_conv1 (Conv2D) (None, 14, 14, 512) 2359008 block5_conv2 (Conv2D) (None, 14, 14, 512) 2359008 block5_conv3 (Conv2D) (None, 14, 14, 512) 2359008 block5_pool (MaxPooling2D) (None, 7, 7, 512) 0 flatten (Flatten) (None, 25088) 0 dense (Dense) (None, 3) 75267 ===== Total params: 14,789,955 Trainable params: 75,267 Non-trainable params: 14,714,688 </pre>
2.	Accuracy	Training Accuracy – 99.28 Validation Accuracy – 69.0	 <pre> View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel) + - 9: + - Run [] Code 81 Epoch 17/25 98/98 [=====] - 534s 5s/step - loss: 0.0018 - accuracy: 0.9826 - val_loss: 1.5850 - val_accuracy: 0.64 33 Epoch 18/25 98/98 [=====] - 529s 5s/step - loss: 0.0924 - accuracy: 0.9765 - val_loss: 1.3129 - val_accuracy: 0.67 25 Epoch 19/25 98/98 [=====] - 521s 5s/step - loss: 0.0645 - accuracy: 0.9837 - val_loss: 1.5075 - val_accuracy: 0.63 74 Epoch 20/25 98/98 [=====] - 522s 5s/step - loss: 0.0550 - accuracy: 0.9877 - val_loss: 1.5227 - val_accuracy: 0.66 08 Epoch 21/25 98/98 [=====] - 528s 5s/step - loss: 0.0765 - accuracy: 0.9765 - val_loss: 1.4917 - val_accuracy: 0.67 25 Epoch 22/25 98/98 [=====] - 527s 5s/step - loss: 0.0610 - accuracy: 0.9888 - val_loss: 1.3730 - val_accuracy: 0.66 67 Epoch 23/25 98/98 [=====] - 522s 5s/step - loss: 0.0494 - accuracy: 0.9877 - val_loss: 1.4801 - val_accuracy: 0.66 67 Epoch 24/25 98/98 [=====] - 524s 5s/step - loss: 0.0418 - accuracy: 0.9888 - val_loss: 1.3900 - val_accuracy: 0.67 25 Epoch 25/25 98/98 [=====] - 520s 5s/step - loss: 0.0348 - accuracy: 0.9928 - val_loss: 1.4304 - val_accuracy: 0.69 01 </pre>

Model Summary:

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TrustedPython 3 (ipykernel)

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%

Run

Code

5. Creating A Model Object

In [20]:

model = Model(inputs=vgg16.input, outputs=prediction)

In [21]:

model.summary()

Model: "model"

Layer (type)	Output Shape	Param #
input_1 (InputLayer)	[(None, 224, 224, 3)]	0
block1_conv1 (Conv2D)	(None, 224, 224, 64)	1792
block1_conv2 (Conv2D)	(None, 224, 224, 64)	36928
block1_pool (MaxPooling2D)	(None, 112, 112, 64)	0
block2_conv1 (Conv2D)	(None, 112, 112, 128)	73856
block2_conv2 (Conv2D)	(None, 112, 112, 128)	147584
block2_pool (MaxPooling2D)	(None, 56, 56, 128)	0
block3_conv1 (Conv2D)	(None, 56, 56, 256)	295168
block3_conv2 (Conv2D)	(None, 56, 56, 256)	590080
block3_conv3 (Conv2D)	(None, 56, 56, 256)	590080

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TrustedPython 3 (ipykernel)

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Run

Code

block3_conv3 (Conv2D)	(None, 56, 56, 256)	590080
block3_pool (MaxPooling2D)	(None, 28, 28, 256)	0
block4_conv1 (Conv2D)	(None, 28, 28, 512)	1180160
block4_conv2 (Conv2D)	(None, 28, 28, 512)	2359808
block4_conv3 (Conv2D)	(None, 28, 28, 512)	2359808
block4_pool (MaxPooling2D)	(None, 14, 14, 512)	0
block5_conv1 (Conv2D)	(None, 14, 14, 512)	2359808
block5_conv2 (Conv2D)	(None, 14, 14, 512)	2359808
block5_conv3 (Conv2D)	(None, 14, 14, 512)	2359808
block5_pool (MaxPooling2D)	(None, 7, 7, 512)	0
flatten (Flatten)	(None, 25088)	0
dense (Dense)	(None, 3)	75267

=====

Total params: 14,789,955

Trainable params: 75,267

Non-trainable params: 14,714,688

=====

Accuracy Level:

```
File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel)

6. Compiling The Model

In [22]: model.compile(
          loss='categorical_crossentropy',
          optimizer='adam',
          metrics=['accuracy'])

7. Training The Model

In [23]: r = model.fit_generator(
          training_set,
          validation_data=test_set,
          epochs=25,
          steps_per_epoch=len(training_set),
          validation_steps=len(test_set))

C:\Users\DELL\AppData\Local\Temp\ipykernel_11136\563002667.py:1: UserWarning: 'Model.fit_generator' is deprecated and will be removed in a future version. Please use 'Model.fit', which supports generators.
  r = model.fit_generator(

Epoch 1/25
98/98 [=====] - 481s 5s/step - loss: 1.2788 - accuracy: 0.5148 - val_loss: 0.8750 - val_accuracy: 0.6491
Epoch 2/25
98/98 [=====] - 537s 5s/step - loss: 0.6810 - accuracy: 0.7324 - val_loss: 1.0317 - val_accuracy: 0.5789
Epoch 3/25
98/98 [=====] - 549s 6s/step - loss: 0.4251 - accuracy: 0.8294 - val_loss: 0.8660 - val_accuracy: 0.67
```

```
jupyter Body Damage Last Checkpoint: 11/14/2022 (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel)

84
Epoch 4/25
98/98 [=====] - 592s 6s/step - loss: 0.3595 - accuracy: 0.8682 - val_loss: 0.9994 - val_accuracy: 0.6608
Epoch 5/25
98/98 [=====] - 530s 5s/step - loss: 0.2640 - accuracy: 0.9070 - val_loss: 1.0432 - val_accuracy: 0.6667
Epoch 6/25
98/98 [=====] - 514s 5s/step - loss: 0.2381 - accuracy: 0.9070 - val_loss: 1.0056 - val_accuracy: 0.6491
Epoch 7/25
98/98 [=====] - 536s 5s/step - loss: 0.1849 - accuracy: 0.9346 - val_loss: 1.1396 - val_accuracy: 0.6667
Epoch 8/25
98/98 [=====] - 581s 6s/step - loss: 0.1554 - accuracy: 0.9479 - val_loss: 1.0145 - val_accuracy: 0.7018
Epoch 9/25
98/98 [=====] - 1291s 13s/step - loss: 0.1448 - accuracy: 0.9499 - val_loss: 1.7283 - val_accuracy: 0.5439
Epoch 10/25
98/98 [=====] - 1177s 12s/step - loss: 0.1138 - accuracy: 0.9622 - val_loss: 1.1071 - val_accuracy: 0.6725
Epoch 11/25
98/98 [=====] - 880s 9s/step - loss: 0.1170 - accuracy: 0.9622 - val_loss: 1.2568 - val_accuracy: 0.6725
Epoch 12/25
98/98 [=====] - 955s 10s/step - loss: 0.1170 - accuracy: 0.9683 - val_loss: 1.1811 - val_accuracy: 0.6842
Epoch 13/25
98/98 [=====] - 883s 9s/step - loss: 0.1143 - accuracy: 0.9642 - val_loss: 1.1550 - val_accuracy: 0.6667
Epoch 14/25
98/98 [=====] - 780s 8s/step - loss: 0.0743 - accuracy: 0.9816 - val_loss: 1.2408 - val_accuracy: 0.6667
```

```
Epoch 15/25
98/98 [=====] - 650s 7s/step - loss: 0.0630 - accuracy: 0.9857 - val_loss: 1.2032 - val_accuracy: 0.72
51
Epoch 16/25
98/98 [=====] - 627s 6s/step - loss: 0.0566 - accuracy: 0.9939 - val_loss: 1.2213 - val_accuracy: 0.69
01
Epoch 17/25
98/98 [=====] - 534s 5s/step - loss: 0.0818 - accuracy: 0.9826 - val_loss: 1.5050 - val_accuracy: 0.64
33
Epoch 18/25
98/98 [=====] - 529s 5s/step - loss: 0.0924 - accuracy: 0.9765 - val_loss: 1.3129 - val_accuracy: 0.67
25
Epoch 19/25
98/98 [=====] - 521s 5s/step - loss: 0.0645 - accuracy: 0.9837 - val_loss: 1.5075 - val_accuracy: 0.63
74
Epoch 20/25
98/98 [=====] - 522s 5s/step - loss: 0.0550 - accuracy: 0.9877 - val_loss: 1.5227 - val_accuracy: 0.66
08
Epoch 21/25
98/98 [=====] - 528s 5s/step - loss: 0.0765 - accuracy: 0.9765 - val_loss: 1.4917 - val_accuracy: 0.67
25
Epoch 22/25
98/98 [=====] - 527s 5s/step - loss: 0.0610 - accuracy: 0.9888 - val_loss: 1.3730 - val_accuracy: 0.66
67
Epoch 23/25
98/98 [=====] - 522s 5s/step - loss: 0.0494 - accuracy: 0.9877 - val_loss: 1.4001 - val_accuracy: 0.66
67
Epoch 24/25
98/98 [=====] - 524s 5s/step - loss: 0.0418 - accuracy: 0.9888 - val_loss: 1.3900 - val_accuracy: 0.67
75
```

```
Epoch 20/25
98/98 [=====] - 522s 5s/step - loss: 0.0550 - accuracy: 0.9877 - val_loss: 1.5227 - val_accuracy: 0.66
08
Epoch 21/25
98/98 [=====] - 528s 5s/step - loss: 0.0765 - accuracy: 0.9765 - val_loss: 1.4917 - val_accuracy: 0.67
25
Epoch 22/25
98/98 [=====] - 527s 5s/step - loss: 0.0610 - accuracy: 0.9888 - val_loss: 1.3730 - val_accuracy: 0.66
67
Epoch 23/25
98/98 [=====] - 522s 5s/step - loss: 0.0494 - accuracy: 0.9877 - val_loss: 1.4001 - val_accuracy: 0.66
67
Epoch 24/25
98/98 [=====] - 524s 5s/step - loss: 0.0418 - accuracy: 0.9888 - val_loss: 1.3900 - val_accuracy: 0.67
25
Epoch 25/25
98/98 [=====] - 520s 5s/step - loss: 0.0348 - accuracy: 0.9928 - val_loss: 1.4304 - val_accuracy: 0.69
01
```

8. Saving The Model

In [24]: `from tensorflow.keras.models import load_model`