Project Development Phase Model Performance Test

Date	7 November 2023	
Team ID	Team-592616	
Project Name	Detecting Covid-19 from Chest X-Rays using	
	Deep Learning Techniques	
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: 15700996 (59.89 MB)	Layer (type)	Output Shape	Param #	Connected to
		Trainable params: 793732 (3.03 MB)	input_1 (InputLayer) mobilenetv2_1.00_224 (Functional)	[(None, 224, 224, 3)] (None, 7, 7, 1280)	0 2257984	[] ['input_1[0][0]']
		Non-trainable params: 14907264 (56.87 MB)	densenet169 (Functional)	(None, 7, 7, 1664)	1264288 0	['input_1[0][0]']
			global_average_pooling2d (GlobalAveragePooling2D)	(None, 1280)	0	['mobilenetv2_1.00_224[0][0]']
			global_average_pooling2d_1 (GlobalAveragePooling2D)	(None, 1664)		['densenet169[0][0]']
			flatten (Flatten)	(None, 1280)	0	['global_average_pooling2d[0][0]']
			flatten_1 (Flatten)	(None, 1664)	0	['global_average_pooling2d_1[0][0]']
			concatenate (Concatenate) Total params: 15700996 (59.1 Trainable params: 793732 (3 Non-trainable params: 14907;	.03 MB)	0	['flatten[0][0]',

Part UN	2.	Accuracy	Training Accuracy -	
Validation Accuracy - 200 1206 200 1	۷.	Accuracy	,	Fronch 1/29
Validation Accuracy - 90.17%			88.10%	Total Maria
Special Designation Security Special Designation Special D				The state of the s
90.17% 90.17%			Validation Accuracy -	
1			90 17%	
Epoch 5/26			30.1770	Epoch 4/28
166/1686 169/168 169/168 169/168				
Epoch (1/8) 1580				
Epoch 17/9 1698/1698				
1989 1958				
Epoch \$/26 1958/1958				10000
Epoch 9/26 1968/1668				
1958/1958				
Epoch 19/20 1988/1688 [The second secon
Epoch 11/20 1958/1958				
1958/1958				
Epoch 12/20 1958/1968 [========] - 2515 238ms/step - loss: 0.3390 - accuracy: 0.8789 - val_accuracy: 0.9121 Epoch 13/20 1958/1968 [========] - ETA: 05 - loss: 0.3332 - accuracy: 0.88100estoring model weights from the end of the best epoch: 1958/1968 [=========] - 2515 237ms/step - loss: 0.3332 - accuracy: 0.8810 - val_loss: 0.2542 - val_accuracy: 0.9119 Epoch 13: early stopping				1-553-952
Epoch 13/20 1658/1058				
1958/1958 [========] - 15s 218ms/step - loss: 0.3332 - accuracy: 0.8810 eval_loss: 0.2542 - val_accuracy: 0.9119				
1958/1958				
67/67 [========] - 15s 218ms/step Accuracy: 90.17% 3. Confidence Score (Only -NANA-				
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		Yolo		
Projects)		Projects)		

Summary:

Layer (type)	Output Shape	Param #	Connected to		
input_1 (InputLayer)	[(None, 224, 224, 3)]	0	[]		
<pre>mobilenetv2_1.00_224 (Func tional)</pre>	(None, 7, 7, 1280)	2257984	['input_1[0][0]']		
densenet169 (Functional)	(None, 7, 7, 1664)	1264288 0	['input_1[0][0]']		
global_average_pooling2d (GlobalAveragePooling2D)	(None, 1280)	0	['mobilenetv2_1.00_224[0][0]']		
global_average_pooling2d_1 (GlobalAveragePooling2D)	(None, 1664)	0	['densenet169[0][0]']		
flatten (Flatten)	(None, 1280)	0	['global_average_pooling2d[0][0]']		
flatten_1 (Flatten)	(None, 1664)	0	['global_average_pooling2d_1[0][0]']		
concatenate (Concatenate) (None, 2944) 0 ['flatten[0][0]', Total params: 15700996 (59.89 MB) Trainable params: 793732 (3.03 MB)					
Non-trainable params: 149072	264 (56.87 MB)				

Training Accuracy:

```
Epoch 1/20
1058/1058 [=
                    ==========] - 249s 236ms/step - loss: 0.4361 - accuracy: 0.8395 - val_loss: 0.3077 - val_accuracy: 0.8922
Epoch 2/20
1058/1058 [=
                         ========] - 251s 237ms/step - loss: 0.4205 - accuracy: 0.8438 - val_loss: 0.3229 - val_accuracy: 0.8837
Epoch 3/20
1058/1058 [=
                                    ==] - 249s 236ms/step - loss: 0.3966 - accuracy: 0.8528 - val_loss: 0.2901 - val_accuracy: 0.8956
Epoch 4/20
                       =========] - 253s 239ms/step - loss: 0.3929 - accuracy: 0.8562 - val_loss: 0.2808 - val_accuracy: 0.9000
1058/1058 [==
Epoch 5/20
                        =========] - 251s 237ms/step - loss: 0.3720 - accuracy: 0.8663 - val_loss: 0.3046 - val_accuracy: 0.8963
1058/1058 [=
Epoch 6/20
1058/1058 [=
                                   ===] - 249s 235ms/step - loss: 0.3756 - accuracy: 0.8613 - val_loss: 0.2865 - val_accuracy: 0.8993
Epoch 7/20
                                   :==] - 248s 234ms/step - loss: 0.3676 - accuracy: 0.8663 - val loss: 0.2687 - val accuracy: 0.9067
1058/1058 [=
Epoch 8/20
                       =========] - 252s 238ms/step - loss: 0.3562 - accuracy: 0.8711 - val_loss: 0.2726 - val_accuracy: 0.9060
1058/1058 [===
Epoch 9/20
1058/1058 [=
                                   :==] - 250s 237ms/step - loss: 0.3587 - accuracy: 0.8724 - val_loss: 0.2813 - val_accuracy: 0.9003
Epoch 10/20
1058/1058 [=
                                   ===] - 252s 238ms/step - loss: 0.3440 - accuracy: 0.8772 - val_loss: 0.2735 - val_accuracy: 0.9081
Epoch 11/20
1058/1058 [==
                       ==========] - 252s 238ms/step - loss: 0.3395 - accuracy: 0.8765 - val_loss: 0.2656 - val_accuracy: 0.9041
Epoch 12/20
1058/1058 [=
                         =========] - 251s 238ms/step - loss: 0.3380 - accuracy: 0.8789 - val_loss: 0.2549 - val_accuracy: 0.9121
Epoch 13/20
1058/1058 [=
                            ========] - ETA: 0s - loss: 0.3332 - accuracy: 0.8810Restoring model weights from the end of the best epoch: 7.
Epoch 13: early stopping
```

Validation Accuracy:

67/67 [=======] - 15s 218ms/step Accuracy: 90.17%

Classification Report:

1	precision	recall	f1-score	support
COVID LUNG_OPACITY NORMAL	0.91	0.82	0.86	723
	0.90	0.88	0.89	1202
	0.89	0.95	0.92	2038
PNEUMONIA accuracy	0.94	0.88	0.91 0.90	269 4232
macro avg	0.91	0.88	0.90	4232
weighted avg	0.90	0.90	0.90	4232

Confusion Matrix:

	COVID	LUNG_OPACITY	NORMAL	PNEUMONIA
COVID	595	46	77	5
LUNG_OPACITY	30	1052	120	0
NORMAL	28	68	1931	11
PNEUMONIA	0	0	31	238