

Model Development Phase Template

Date	01 May 2025
Team ID	739870
Project Title	CovidVision: Advanced COVID-19 Detection From Lung X-Rays With Deep Learning Using IBM Cloud
Maximum Marks	10 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

Initial Model Training Code (5 marks):

```
# fit the model
r = model.fit_generator(
    training_set,
    validation_data=test_set,
    epochs=25,
    steps_per_epoch=len(training_set)//16,
    validation_steps=len(test_set)//16, callbacks = my_callbacks
)
```

Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics
Model 1	<pre># View the structure of the model: model.summary() Model: "model" Layer (type) Output Shape Param # Connected to ----- input_1 (InputLayer) 0 0 conv2d (Conv2D) (None, 140, 140, 32 864 ['input_1[0][0]'] batch_normalization (BatchNormal (None, 140, 140, 32 0 ['conv2d[0][0]'] activation_1 (Activation) (None, 140, 140, 32 0 ['batch_normalization[0][0]'] conv2d_1 (Conv2D) (None, 147, 147, 32 9216 ['activation_1[0]'] batch_normalization_1 (BatchNormal (None, 147, 147, 32 0 ['conv2d_1[0][0]'] activation_2 (Activation) (None, 147, 147, 32 0 ['batch_normalization_1[0][0]'] concatenate_1 (Concatenate) (None, 8, 8, 160) 0 ['activation_2[0][0]', 'activation_2[0][0]'] activation_3 (Activation) (None, 8, 8, 160) 0 ['batch_normalization_1[0][0]'] mixed9 (Concatenate) (None, 8, 8, 2048) 0 ['activation_3[0][0]', 'mixed9_1[0][0]'] mixed9_1 (Concatenate) (None, 8, 8, 2048) 0 ['concatenate_1[0][0]', 'activation_3[0][0]'] flatten (Flatten) (None, 131072) 0 ['mixed9[0][0]'] dense (Dense) (None, 4) 524292 ['flatten[0][0]'] Total params: 22,527,806 Trainable params: 524,292 Non-trainable params: 21,882,784</pre>	<pre>epoch 1/25 16/16 [=====] - 130s 2s/step - loss: 5.7118 - accuracy: 0.7401 - val_loss: 14.6190 - val_accuracy: 0.6518 epoch 2/25 16/16 [=====] - 128s 2s/step - loss: 5.6250 - accuracy: 0.7897 - val_loss: 8.1321 - val_accuracy: 0.7143 epoch 3/25 16/16 [=====] - 116s 2s/step - loss: 4.2671 - accuracy: 0.8883 - val_loss: 5.1618 - val_accuracy: 0.7411 epoch 4/25 16/16 [=====] - 112s 2s/step - loss: 5.9812 - accuracy: 0.7821 - val_loss: 8.0758 - val_accuracy: 0.6780 epoch 5/25 16/16 [=====] - 180s 1s/step - loss: 6.8841 - accuracy: 0.7884 - val_loss: 8.8117 - val_accuracy: 0.7411 epoch 6/25 16/16 [=====] - 181s 1s/step - loss: 7.2119 - accuracy: 0.7838 - val_loss: 10.1231 - val_accuracy: 0.7946 epoch 7/25 16/16 [=====] - 111s 1s/step - loss: 6.1817 - accuracy: 0.8193 - val_loss: 8.2815 - val_accuracy: 0.6875 epoch 8/25 16/16 [=====] - 91s 1s/step - loss: 5.5564 - accuracy: 0.8125 - val_loss: 15.7261 - val_accuracy: 0.7143 epoch 9/25 16/16 [=====] - 80s 1s/step - loss: 5.8754 - accuracy: 0.8145 - val_loss: 8.6080 - val_accuracy: 0.7679</pre>

