\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Layer (type) Output Shape Param # Connected to

==================================================================================================

input\_9 (InputLayer) [(None, 224, 224, 3 0 []

)]

conv2d\_95 (Conv2D) (None, 111, 111, 32 864 ['input\_9[0][0]']

)

batch\_normalization\_94 (BatchN (None, 111, 111, 32 96 ['conv2d\_95[0][0]']

ormalization) )

activation\_94 (Activation) (None, 111, 111, 32 0 ['batch\_normalization\_94[0][0]']

)

conv2d\_96 (Conv2D) (None, 109, 109, 32 9216 ['activation\_94[0][0]']

)

batch\_normalization\_95 (BatchN (None, 109, 109, 32 96 ['conv2d\_96[0][0]']

ormalization) )

activation\_95 (Activation) (None, 109, 109, 32 0 ['batch\_normalization\_95[0][0]']

)

conv2d\_97 (Conv2D) (None, 109, 109, 64 18432 ['activation\_95[0][0]']

)

batch\_normalization\_96 (BatchN (None, 109, 109, 64 192 ['conv2d\_97[0][0]']

ormalization) )

activation\_96 (Activation) (None, 109, 109, 64 0 ['batch\_normalization\_96[0][0]']

)

max\_pooling2d\_4 (MaxPooling2D) (None, 54, 54, 64) 0 ['activation\_96[0][0]']

conv2d\_98 (Conv2D) (None, 54, 54, 80) 5120 ['max\_pooling2d\_4[0][0]']

batch\_normalization\_97 (BatchN (None, 54, 54, 80) 240 ['conv2d\_98[0][0]']

ormalization)

activation\_97 (Activation) (None, 54, 54, 80) 0 ['batch\_normalization\_97[0][0]']

conv2d\_99 (Conv2D) (None, 52, 52, 192) 138240 ['activation\_97[0][0]']

batch\_normalization\_98 (BatchN (None, 52, 52, 192) 576 ['conv2d\_99[0][0]']

ormalization)

activation\_98 (Activation) (None, 52, 52, 192) 0 ['batch\_normalization\_98[0][0]']

max\_pooling2d\_5 (MaxPooling2D) (None, 25, 25, 192) 0 ['activation\_98[0][0]']

conv2d\_103 (Conv2D) (None, 25, 25, 64) 12288 ['max\_pooling2d\_5[0][0]']

batch\_normalization\_102 (Batch (None, 25, 25, 64) 192 ['conv2d\_103[0][0]']

Normalization)

activation\_102 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_102[0][0]']

conv2d\_101 (Conv2D) (None, 25, 25, 48) 9216 ['max\_pooling2d\_5[0][0]']

conv2d\_104 (Conv2D) (None, 25, 25, 96) 55296 ['activation\_102[0][0]']

batch\_normalization\_100 (Batch (None, 25, 25, 48) 144 ['conv2d\_101[0][0]']

Normalization)

batch\_normalization\_103 (Batch (None, 25, 25, 96) 288 ['conv2d\_104[0][0]']

Normalization)

activation\_100 (Activation) (None, 25, 25, 48) 0 ['batch\_normalization\_100[0][0]']

activation\_103 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_103[0][0]']

average\_pooling2d\_9 (AveragePo (None, 25, 25, 192) 0 ['max\_pooling2d\_5[0][0]']

oling2D)

conv2d\_100 (Conv2D) (None, 25, 25, 64) 12288 ['max\_pooling2d\_5[0][0]']

conv2d\_102 (Conv2D) (None, 25, 25, 64) 76800 ['activation\_100[0][0]']

conv2d\_105 (Conv2D) (None, 25, 25, 96) 82944 ['activation\_103[0][0]']

conv2d\_106 (Conv2D) (None, 25, 25, 32) 6144 ['average\_pooling2d\_9[0][0]']

batch\_normalization\_99 (BatchN (None, 25, 25, 64) 192 ['conv2d\_100[0][0]']

ormalization)

batch\_normalization\_101 (Batch (None, 25, 25, 64) 192 ['conv2d\_102[0][0]']

Normalization)

batch\_normalization\_104 (Batch (None, 25, 25, 96) 288 ['conv2d\_105[0][0]']

Normalization)

batch\_normalization\_105 (Batch (None, 25, 25, 32) 96 ['conv2d\_106[0][0]']

Normalization)

activation\_99 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_99[0][0]']

activation\_101 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_101[0][0]']

activation\_104 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_104[0][0]']

activation\_105 (Activation) (None, 25, 25, 32) 0 ['batch\_normalization\_105[0][0]']

mixed0 (Concatenate) (None, 25, 25, 256) 0 ['activation\_99[0][0]',

'activation\_101[0][0]',

'activation\_104[0][0]',

'activation\_105[0][0]']

conv2d\_110 (Conv2D) (None, 25, 25, 64) 16384 ['mixed0[0][0]']

batch\_normalization\_109 (Batch (None, 25, 25, 64) 192 ['conv2d\_110[0][0]']

Normalization)

activation\_109 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_109[0][0]']

conv2d\_108 (Conv2D) (None, 25, 25, 48) 12288 ['mixed0[0][0]']

conv2d\_111 (Conv2D) (None, 25, 25, 96) 55296 ['activation\_109[0][0]']

batch\_normalization\_107 (Batch (None, 25, 25, 48) 144 ['conv2d\_108[0][0]']

Normalization)

batch\_normalization\_110 (Batch (None, 25, 25, 96) 288 ['conv2d\_111[0][0]']

Normalization)

activation\_107 (Activation) (None, 25, 25, 48) 0 ['batch\_normalization\_107[0][0]']

activation\_110 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_110[0][0]']

average\_pooling2d\_10 (AverageP (None, 25, 25, 256) 0 ['mixed0[0][0]']

ooling2D)

conv2d\_107 (Conv2D) (None, 25, 25, 64) 16384 ['mixed0[0][0]']

conv2d\_109 (Conv2D) (None, 25, 25, 64) 76800 ['activation\_107[0][0]']

conv2d\_112 (Conv2D) (None, 25, 25, 96) 82944 ['activation\_110[0][0]']

conv2d\_113 (Conv2D) (None, 25, 25, 64) 16384 ['average\_pooling2d\_10[0][0]']

batch\_normalization\_106 (Batch (None, 25, 25, 64) 192 ['conv2d\_107[0][0]']

Normalization)

batch\_normalization\_108 (Batch (None, 25, 25, 64) 192 ['conv2d\_109[0][0]']

Normalization)

batch\_normalization\_111 (Batch (None, 25, 25, 96) 288 ['conv2d\_112[0][0]']

Normalization)

batch\_normalization\_112 (Batch (None, 25, 25, 64) 192 ['conv2d\_113[0][0]']

Normalization)

activation\_106 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_106[0][0]']

activation\_108 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_108[0][0]']

activation\_111 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_111[0][0]']

activation\_112 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_112[0][0]']

mixed1 (Concatenate) (None, 25, 25, 288) 0 ['activation\_106[0][0]',

'activation\_108[0][0]',

'activation\_111[0][0]',

'activation\_112[0][0]']

conv2d\_117 (Conv2D) (None, 25, 25, 64) 18432 ['mixed1[0][0]']

batch\_normalization\_116 (Batch (None, 25, 25, 64) 192 ['conv2d\_117[0][0]']

Normalization)

activation\_116 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_116[0][0]']

conv2d\_115 (Conv2D) (None, 25, 25, 48) 13824 ['mixed1[0][0]']

conv2d\_118 (Conv2D) (None, 25, 25, 96) 55296 ['activation\_116[0][0]']

batch\_normalization\_114 (Batch (None, 25, 25, 48) 144 ['conv2d\_115[0][0]']

Normalization)

batch\_normalization\_117 (Batch (None, 25, 25, 96) 288 ['conv2d\_118[0][0]']

Normalization)

activation\_114 (Activation) (None, 25, 25, 48) 0 ['batch\_normalization\_114[0][0]']

activation\_117 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_117[0][0]']

average\_pooling2d\_11 (AverageP (None, 25, 25, 288) 0 ['mixed1[0][0]']

ooling2D)

conv2d\_114 (Conv2D) (None, 25, 25, 64) 18432 ['mixed1[0][0]']

conv2d\_116 (Conv2D) (None, 25, 25, 64) 76800 ['activation\_114[0][0]']

conv2d\_119 (Conv2D) (None, 25, 25, 96) 82944 ['activation\_117[0][0]']

conv2d\_120 (Conv2D) (None, 25, 25, 64) 18432 ['average\_pooling2d\_11[0][0]']

batch\_normalization\_113 (Batch (None, 25, 25, 64) 192 ['conv2d\_114[0][0]']

Normalization)

batch\_normalization\_115 (Batch (None, 25, 25, 64) 192 ['conv2d\_116[0][0]']

Normalization)

batch\_normalization\_118 (Batch (None, 25, 25, 96) 288 ['conv2d\_119[0][0]']

Normalization)

batch\_normalization\_119 (Batch (None, 25, 25, 64) 192 ['conv2d\_120[0][0]']

Normalization)

activation\_113 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_113[0][0]']

activation\_115 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_115[0][0]']

activation\_118 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_118[0][0]']

activation\_119 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_119[0][0]']

mixed2 (Concatenate) (None, 25, 25, 288) 0 ['activation\_113[0][0]',

'activation\_115[0][0]',

'activation\_118[0][0]',

'activation\_119[0][0]']

conv2d\_122 (Conv2D) (None, 25, 25, 64) 18432 ['mixed2[0][0]']

batch\_normalization\_121 (Batch (None, 25, 25, 64) 192 ['conv2d\_122[0][0]']

Normalization)

activation\_121 (Activation) (None, 25, 25, 64) 0 ['batch\_normalization\_121[0][0]']

conv2d\_123 (Conv2D) (None, 25, 25, 96) 55296 ['activation\_121[0][0]']

batch\_normalization\_122 (Batch (None, 25, 25, 96) 288 ['conv2d\_123[0][0]']

Normalization)

activation\_122 (Activation) (None, 25, 25, 96) 0 ['batch\_normalization\_122[0][0]']

conv2d\_121 (Conv2D) (None, 12, 12, 384) 995328 ['mixed2[0][0]']

conv2d\_124 (Conv2D) (None, 12, 12, 96) 82944 ['activation\_122[0][0]']

batch\_normalization\_120 (Batch (None, 12, 12, 384) 1152 ['conv2d\_121[0][0]']

Normalization)

batch\_normalization\_123 (Batch (None, 12, 12, 96) 288 ['conv2d\_124[0][0]']

Normalization)

activation\_120 (Activation) (None, 12, 12, 384) 0 ['batch\_normalization\_120[0][0]']

activation\_123 (Activation) (None, 12, 12, 96) 0 ['batch\_normalization\_123[0][0]']

max\_pooling2d\_6 (MaxPooling2D) (None, 12, 12, 288) 0 ['mixed2[0][0]']

mixed3 (Concatenate) (None, 12, 12, 768) 0 ['activation\_120[0][0]',

'activation\_123[0][0]',

'max\_pooling2d\_6[0][0]']

conv2d\_129 (Conv2D) (None, 12, 12, 128) 98304 ['mixed3[0][0]']

batch\_normalization\_128 (Batch (None, 12, 12, 128) 384 ['conv2d\_129[0][0]']

Normalization)

activation\_128 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_128[0][0]']

conv2d\_130 (Conv2D) (None, 12, 12, 128) 114688 ['activation\_128[0][0]']

batch\_normalization\_129 (Batch (None, 12, 12, 128) 384 ['conv2d\_130[0][0]']

Normalization)

activation\_129 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_129[0][0]']

conv2d\_126 (Conv2D) (None, 12, 12, 128) 98304 ['mixed3[0][0]']

conv2d\_131 (Conv2D) (None, 12, 12, 128) 114688 ['activation\_129[0][0]']

batch\_normalization\_125 (Batch (None, 12, 12, 128) 384 ['conv2d\_126[0][0]']

Normalization)

batch\_normalization\_130 (Batch (None, 12, 12, 128) 384 ['conv2d\_131[0][0]']

Normalization)

activation\_125 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_125[0][0]']

activation\_130 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_130[0][0]']

conv2d\_127 (Conv2D) (None, 12, 12, 128) 114688 ['activation\_125[0][0]']

conv2d\_132 (Conv2D) (None, 12, 12, 128) 114688 ['activation\_130[0][0]']

batch\_normalization\_126 (Batch (None, 12, 12, 128) 384 ['conv2d\_127[0][0]']

Normalization)

batch\_normalization\_131 (Batch (None, 12, 12, 128) 384 ['conv2d\_132[0][0]']

Normalization)

activation\_126 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_126[0][0]']

activation\_131 (Activation) (None, 12, 12, 128) 0 ['batch\_normalization\_131[0][0]']

average\_pooling2d\_12 (AverageP (None, 12, 12, 768) 0 ['mixed3[0][0]']

ooling2D)

conv2d\_125 (Conv2D) (None, 12, 12, 192) 147456 ['mixed3[0][0]']

conv2d\_128 (Conv2D) (None, 12, 12, 192) 172032 ['activation\_126[0][0]']

conv2d\_133 (Conv2D) (None, 12, 12, 192) 172032 ['activation\_131[0][0]']

conv2d\_134 (Conv2D) (None, 12, 12, 192) 147456 ['average\_pooling2d\_12[0][0]']

batch\_normalization\_124 (Batch (None, 12, 12, 192) 576 ['conv2d\_125[0][0]']

Normalization)

batch\_normalization\_127 (Batch (None, 12, 12, 192) 576 ['conv2d\_128[0][0]']

Normalization)

batch\_normalization\_132 (Batch (None, 12, 12, 192) 576 ['conv2d\_133[0][0]']

Normalization)

batch\_normalization\_133 (Batch (None, 12, 12, 192) 576 ['conv2d\_134[0][0]']

Normalization)

activation\_124 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_124[0][0]']

activation\_127 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_127[0][0]']

activation\_132 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_132[0][0]']

activation\_133 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_133[0][0]']

mixed4 (Concatenate) (None, 12, 12, 768) 0 ['activation\_124[0][0]',

'activation\_127[0][0]',

'activation\_132[0][0]',

'activation\_133[0][0]']

conv2d\_139 (Conv2D) (None, 12, 12, 160) 122880 ['mixed4[0][0]']

batch\_normalization\_138 (Batch (None, 12, 12, 160) 480 ['conv2d\_139[0][0]']

Normalization)

activation\_138 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_138[0][0]']

conv2d\_140 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_138[0][0]']

batch\_normalization\_139 (Batch (None, 12, 12, 160) 480 ['conv2d\_140[0][0]']

Normalization)

activation\_139 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_139[0][0]']

conv2d\_136 (Conv2D) (None, 12, 12, 160) 122880 ['mixed4[0][0]']

conv2d\_141 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_139[0][0]']

batch\_normalization\_135 (Batch (None, 12, 12, 160) 480 ['conv2d\_136[0][0]']

Normalization)

batch\_normalization\_140 (Batch (None, 12, 12, 160) 480 ['conv2d\_141[0][0]']

Normalization)

activation\_135 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_135[0][0]']

activation\_140 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_140[0][0]']

conv2d\_137 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_135[0][0]']

conv2d\_142 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_140[0][0]']

batch\_normalization\_136 (Batch (None, 12, 12, 160) 480 ['conv2d\_137[0][0]']

Normalization)

batch\_normalization\_141 (Batch (None, 12, 12, 160) 480 ['conv2d\_142[0][0]']

Normalization)

activation\_136 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_136[0][0]']

activation\_141 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_141[0][0]']

average\_pooling2d\_13 (AverageP (None, 12, 12, 768) 0 ['mixed4[0][0]']

ooling2D)

conv2d\_135 (Conv2D) (None, 12, 12, 192) 147456 ['mixed4[0][0]']

conv2d\_138 (Conv2D) (None, 12, 12, 192) 215040 ['activation\_136[0][0]']

conv2d\_143 (Conv2D) (None, 12, 12, 192) 215040 ['activation\_141[0][0]']

conv2d\_144 (Conv2D) (None, 12, 12, 192) 147456 ['average\_pooling2d\_13[0][0]']

batch\_normalization\_134 (Batch (None, 12, 12, 192) 576 ['conv2d\_135[0][0]']

Normalization)

batch\_normalization\_137 (Batch (None, 12, 12, 192) 576 ['conv2d\_138[0][0]']

Normalization)

batch\_normalization\_142 (Batch (None, 12, 12, 192) 576 ['conv2d\_143[0][0]']

Normalization)

batch\_normalization\_143 (Batch (None, 12, 12, 192) 576 ['conv2d\_144[0][0]']

Normalization)

activation\_134 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_134[0][0]']

activation\_137 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_137[0][0]']

activation\_142 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_142[0][0]']

activation\_143 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_143[0][0]']

mixed5 (Concatenate) (None, 12, 12, 768) 0 ['activation\_134[0][0]',

'activation\_137[0][0]',

'activation\_142[0][0]',

'activation\_143[0][0]']

conv2d\_149 (Conv2D) (None, 12, 12, 160) 122880 ['mixed5[0][0]']

batch\_normalization\_148 (Batch (None, 12, 12, 160) 480 ['conv2d\_149[0][0]']

Normalization)

activation\_148 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_148[0][0]']

conv2d\_150 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_148[0][0]']

batch\_normalization\_149 (Batch (None, 12, 12, 160) 480 ['conv2d\_150[0][0]']

Normalization)

activation\_149 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_149[0][0]']

conv2d\_146 (Conv2D) (None, 12, 12, 160) 122880 ['mixed5[0][0]']

conv2d\_151 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_149[0][0]']

batch\_normalization\_145 (Batch (None, 12, 12, 160) 480 ['conv2d\_146[0][0]']

Normalization)

batch\_normalization\_150 (Batch (None, 12, 12, 160) 480 ['conv2d\_151[0][0]']

Normalization)

activation\_145 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_145[0][0]']

activation\_150 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_150[0][0]']

conv2d\_147 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_145[0][0]']

conv2d\_152 (Conv2D) (None, 12, 12, 160) 179200 ['activation\_150[0][0]']

batch\_normalization\_146 (Batch (None, 12, 12, 160) 480 ['conv2d\_147[0][0]']

Normalization)

batch\_normalization\_151 (Batch (None, 12, 12, 160) 480 ['conv2d\_152[0][0]']

Normalization)

activation\_146 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_146[0][0]']

activation\_151 (Activation) (None, 12, 12, 160) 0 ['batch\_normalization\_151[0][0]']

average\_pooling2d\_14 (AverageP (None, 12, 12, 768) 0 ['mixed5[0][0]']

ooling2D)

conv2d\_145 (Conv2D) (None, 12, 12, 192) 147456 ['mixed5[0][0]']

conv2d\_148 (Conv2D) (None, 12, 12, 192) 215040 ['activation\_146[0][0]']

conv2d\_153 (Conv2D) (None, 12, 12, 192) 215040 ['activation\_151[0][0]']

conv2d\_154 (Conv2D) (None, 12, 12, 192) 147456 ['average\_pooling2d\_14[0][0]']

batch\_normalization\_144 (Batch (None, 12, 12, 192) 576 ['conv2d\_145[0][0]']

Normalization)

batch\_normalization\_147 (Batch (None, 12, 12, 192) 576 ['conv2d\_148[0][0]']

Normalization)

batch\_normalization\_152 (Batch (None, 12, 12, 192) 576 ['conv2d\_153[0][0]']

Normalization)

batch\_normalization\_153 (Batch (None, 12, 12, 192) 576 ['conv2d\_154[0][0]']

Normalization)

activation\_144 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_144[0][0]']

activation\_147 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_147[0][0]']

activation\_152 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_152[0][0]']

activation\_153 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_153[0][0]']

mixed6 (Concatenate) (None, 12, 12, 768) 0 ['activation\_144[0][0]',

'activation\_147[0][0]',

'activation\_152[0][0]',

'activation\_153[0][0]']

conv2d\_159 (Conv2D) (None, 12, 12, 192) 147456 ['mixed6[0][0]']

batch\_normalization\_158 (Batch (None, 12, 12, 192) 576 ['conv2d\_159[0][0]']

Normalization)

activation\_158 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_158[0][0]']

conv2d\_160 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_158[0][0]']

batch\_normalization\_159 (Batch (None, 12, 12, 192) 576 ['conv2d\_160[0][0]']

Normalization)

activation\_159 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_159[0][0]']

conv2d\_156 (Conv2D) (None, 12, 12, 192) 147456 ['mixed6[0][0]']

conv2d\_161 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_159[0][0]']

batch\_normalization\_155 (Batch (None, 12, 12, 192) 576 ['conv2d\_156[0][0]']

Normalization)

batch\_normalization\_160 (Batch (None, 12, 12, 192) 576 ['conv2d\_161[0][0]']

Normalization)

activation\_155 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_155[0][0]']

activation\_160 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_160[0][0]']

conv2d\_157 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_155[0][0]']

conv2d\_162 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_160[0][0]']

batch\_normalization\_156 (Batch (None, 12, 12, 192) 576 ['conv2d\_157[0][0]']

Normalization)

batch\_normalization\_161 (Batch (None, 12, 12, 192) 576 ['conv2d\_162[0][0]']

Normalization)

activation\_156 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_156[0][0]']

activation\_161 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_161[0][0]']

average\_pooling2d\_15 (AverageP (None, 12, 12, 768) 0 ['mixed6[0][0]']

ooling2D)

conv2d\_155 (Conv2D) (None, 12, 12, 192) 147456 ['mixed6[0][0]']

conv2d\_158 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_156[0][0]']

conv2d\_163 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_161[0][0]']

conv2d\_164 (Conv2D) (None, 12, 12, 192) 147456 ['average\_pooling2d\_15[0][0]']

batch\_normalization\_154 (Batch (None, 12, 12, 192) 576 ['conv2d\_155[0][0]']

Normalization)

batch\_normalization\_157 (Batch (None, 12, 12, 192) 576 ['conv2d\_158[0][0]']

Normalization)

batch\_normalization\_162 (Batch (None, 12, 12, 192) 576 ['conv2d\_163[0][0]']

Normalization)

batch\_normalization\_163 (Batch (None, 12, 12, 192) 576 ['conv2d\_164[0][0]']

Normalization)

activation\_154 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_154[0][0]']

activation\_157 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_157[0][0]']

activation\_162 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_162[0][0]']

activation\_163 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_163[0][0]']

mixed7 (Concatenate) (None, 12, 12, 768) 0 ['activation\_154[0][0]',

'activation\_157[0][0]',

'activation\_162[0][0]',

'activation\_163[0][0]']

conv2d\_167 (Conv2D) (None, 12, 12, 192) 147456 ['mixed7[0][0]']

batch\_normalization\_166 (Batch (None, 12, 12, 192) 576 ['conv2d\_167[0][0]']

Normalization)

activation\_166 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_166[0][0]']

conv2d\_168 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_166[0][0]']

batch\_normalization\_167 (Batch (None, 12, 12, 192) 576 ['conv2d\_168[0][0]']

Normalization)

activation\_167 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_167[0][0]']

conv2d\_165 (Conv2D) (None, 12, 12, 192) 147456 ['mixed7[0][0]']

conv2d\_169 (Conv2D) (None, 12, 12, 192) 258048 ['activation\_167[0][0]']

batch\_normalization\_164 (Batch (None, 12, 12, 192) 576 ['conv2d\_165[0][0]']

Normalization)

batch\_normalization\_168 (Batch (None, 12, 12, 192) 576 ['conv2d\_169[0][0]']

Normalization)

activation\_164 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_164[0][0]']

activation\_168 (Activation) (None, 12, 12, 192) 0 ['batch\_normalization\_168[0][0]']

conv2d\_166 (Conv2D) (None, 5, 5, 320) 552960 ['activation\_164[0][0]']

conv2d\_170 (Conv2D) (None, 5, 5, 192) 331776 ['activation\_168[0][0]']

batch\_normalization\_165 (Batch (None, 5, 5, 320) 960 ['conv2d\_166[0][0]']

Normalization)

batch\_normalization\_169 (Batch (None, 5, 5, 192) 576 ['conv2d\_170[0][0]']

Normalization)

activation\_165 (Activation) (None, 5, 5, 320) 0 ['batch\_normalization\_165[0][0]']

activation\_169 (Activation) (None, 5, 5, 192) 0 ['batch\_normalization\_169[0][0]']

max\_pooling2d\_7 (MaxPooling2D) (None, 5, 5, 768) 0 ['mixed7[0][0]']

mixed8 (Concatenate) (None, 5, 5, 1280) 0 ['activation\_165[0][0]',

'activation\_169[0][0]',

'max\_pooling2d\_7[0][0]']

conv2d\_175 (Conv2D) (None, 5, 5, 448) 573440 ['mixed8[0][0]']

batch\_normalization\_174 (Batch (None, 5, 5, 448) 1344 ['conv2d\_175[0][0]']

Normalization)

activation\_174 (Activation) (None, 5, 5, 448) 0 ['batch\_normalization\_174[0][0]']

conv2d\_172 (Conv2D) (None, 5, 5, 384) 491520 ['mixed8[0][0]']

conv2d\_176 (Conv2D) (None, 5, 5, 384) 1548288 ['activation\_174[0][0]']

batch\_normalization\_171 (Batch (None, 5, 5, 384) 1152 ['conv2d\_172[0][0]']

Normalization)

batch\_normalization\_175 (Batch (None, 5, 5, 384) 1152 ['conv2d\_176[0][0]']

Normalization)

activation\_171 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_171[0][0]']

activation\_175 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_175[0][0]']

conv2d\_173 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_171[0][0]']

conv2d\_174 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_171[0][0]']

conv2d\_177 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_175[0][0]']

conv2d\_178 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_175[0][0]']

average\_pooling2d\_16 (AverageP (None, 5, 5, 1280) 0 ['mixed8[0][0]']

ooling2D)

conv2d\_171 (Conv2D) (None, 5, 5, 320) 409600 ['mixed8[0][0]']

batch\_normalization\_172 (Batch (None, 5, 5, 384) 1152 ['conv2d\_173[0][0]']

Normalization)

batch\_normalization\_173 (Batch (None, 5, 5, 384) 1152 ['conv2d\_174[0][0]']

Normalization)

batch\_normalization\_176 (Batch (None, 5, 5, 384) 1152 ['conv2d\_177[0][0]']

Normalization)

batch\_normalization\_177 (Batch (None, 5, 5, 384) 1152 ['conv2d\_178[0][0]']

Normalization)

conv2d\_179 (Conv2D) (None, 5, 5, 192) 245760 ['average\_pooling2d\_16[0][0]']

batch\_normalization\_170 (Batch (None, 5, 5, 320) 960 ['conv2d\_171[0][0]']

Normalization)

activation\_172 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_172[0][0]']

activation\_173 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_173[0][0]']

activation\_176 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_176[0][0]']

activation\_177 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_177[0][0]']

batch\_normalization\_178 (Batch (None, 5, 5, 192) 576 ['conv2d\_179[0][0]']

Normalization)

activation\_170 (Activation) (None, 5, 5, 320) 0 ['batch\_normalization\_170[0][0]']

mixed9\_0 (Concatenate) (None, 5, 5, 768) 0 ['activation\_172[0][0]',

'activation\_173[0][0]']

concatenate\_2 (Concatenate) (None, 5, 5, 768) 0 ['activation\_176[0][0]',

'activation\_177[0][0]']

activation\_178 (Activation) (None, 5, 5, 192) 0 ['batch\_normalization\_178[0][0]']

mixed9 (Concatenate) (None, 5, 5, 2048) 0 ['activation\_170[0][0]',

'mixed9\_0[0][0]',

'concatenate\_2[0][0]',

'activation\_178[0][0]']

conv2d\_184 (Conv2D) (None, 5, 5, 448) 917504 ['mixed9[0][0]']

batch\_normalization\_183 (Batch (None, 5, 5, 448) 1344 ['conv2d\_184[0][0]']

Normalization)

activation\_183 (Activation) (None, 5, 5, 448) 0 ['batch\_normalization\_183[0][0]']

conv2d\_181 (Conv2D) (None, 5, 5, 384) 786432 ['mixed9[0][0]']

conv2d\_185 (Conv2D) (None, 5, 5, 384) 1548288 ['activation\_183[0][0]']

batch\_normalization\_180 (Batch (None, 5, 5, 384) 1152 ['conv2d\_181[0][0]']

Normalization)

batch\_normalization\_184 (Batch (None, 5, 5, 384) 1152 ['conv2d\_185[0][0]']

Normalization)

activation\_180 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_180[0][0]']

activation\_184 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_184[0][0]']

conv2d\_182 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_180[0][0]']

conv2d\_183 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_180[0][0]']

conv2d\_186 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_184[0][0]']

conv2d\_187 (Conv2D) (None, 5, 5, 384) 442368 ['activation\_184[0][0]']

average\_pooling2d\_17 (AverageP (None, 5, 5, 2048) 0 ['mixed9[0][0]']

ooling2D)

conv2d\_180 (Conv2D) (None, 5, 5, 320) 655360 ['mixed9[0][0]']

batch\_normalization\_181 (Batch (None, 5, 5, 384) 1152 ['conv2d\_182[0][0]']

Normalization)

batch\_normalization\_182 (Batch (None, 5, 5, 384) 1152 ['conv2d\_183[0][0]']

Normalization)

batch\_normalization\_185 (Batch (None, 5, 5, 384) 1152 ['conv2d\_186[0][0]']

Normalization)

batch\_normalization\_186 (Batch (None, 5, 5, 384) 1152 ['conv2d\_187[0][0]']

Normalization)

conv2d\_188 (Conv2D) (None, 5, 5, 192) 393216 ['average\_pooling2d\_17[0][0]']

batch\_normalization\_179 (Batch (None, 5, 5, 320) 960 ['conv2d\_180[0][0]']

Normalization)

activation\_181 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_181[0][0]']

activation\_182 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_182[0][0]']

activation\_185 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_185[0][0]']

activation\_186 (Activation) (None, 5, 5, 384) 0 ['batch\_normalization\_186[0][0]']

batch\_normalization\_187 (Batch (None, 5, 5, 192) 576 ['conv2d\_188[0][0]']

Normalization)

activation\_179 (Activation) (None, 5, 5, 320) 0 ['batch\_normalization\_179[0][0]']

mixed9\_1 (Concatenate) (None, 5, 5, 768) 0 ['activation\_181[0][0]',

'activation\_182[0][0]']

concatenate\_3 (Concatenate) (None, 5, 5, 768) 0 ['activation\_185[0][0]',

'activation\_186[0][0]']

activation\_187 (Activation) (None, 5, 5, 192) 0 ['batch\_normalization\_187[0][0]']

mixed10 (Concatenate) (None, 5, 5, 2048) 0 ['activation\_179[0][0]',

'mixed9\_1[0][0]',

'concatenate\_3[0][0]',

'activation\_187[0][0]']

flatten\_3 (Flatten) (None, 51200) 0 ['mixed10[0][0]']

dense\_3 (Dense) (None, 1) 51201 ['flatten\_3[0][0]']

==================================================================================================

Total params: 21,853,985

Trainable params: 51,201

Non-trainable params: 21,802,784

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Epoch 1/100

55/55 [==============================] - 56s 913ms/step - loss: 1.4988 - accuracy: 0.7984 - val\_loss: 0.2761 - val\_accuracy: 0.9240 - lr: 0.0010

Epoch 2/100

55/55 [==============================] - 48s 867ms/step - loss: 0.1438 - accuracy: 0.9510 - val\_loss: 0.1499 - val\_accuracy: 0.9424 - lr: 0.0010

Epoch 3/100

55/55 [==============================] - 48s 875ms/step - loss: 0.0491 - accuracy: 0.9844 - val\_loss: 0.1532 - val\_accuracy: 0.9378 - lr: 0.0010

Epoch 4/100

55/55 [==============================] - 47s 854ms/step - loss: 0.0407 - accuracy: 0.9856 - val\_loss: 0.1284 - val\_accuracy: 0.9608 - lr: 0.0010

Epoch 5/100

55/55 [==============================] - 47s 857ms/step - loss: 0.0594 - accuracy: 0.9752 - val\_loss: 0.1369 - val\_accuracy: 0.9493 - lr: 0.0010

Epoch 6/100

55/55 [==============================] - 47s 855ms/step - loss: 0.0086 - accuracy: 0.9983 - val\_loss: 0.1125 - val\_accuracy: 0.9608 - lr: 0.0010

Epoch 7/100

55/55 [==============================] - 47s 847ms/step - loss: 0.0037 - accuracy: 1.0000 - val\_loss: 0.1170 - val\_accuracy: 0.9539 - lr: 0.0010

Epoch 8/100

55/55 [==============================] - 46s 847ms/step - loss: 0.0025 - accuracy: 1.0000 - val\_loss: 0.1178 - val\_accuracy: 0.9539 - lr: 0.0010

Epoch 9/100

55/55 [==============================] - 47s 857ms/step - loss: 0.0021 - accuracy: 1.0000 - val\_loss: 0.1204 - val\_accuracy: 0.9539 - lr: 0.0010

Epoch 10/100

55/55 [==============================] - 47s 843ms/step - loss: 0.0019 - accuracy: 1.0000 - val\_loss: 0.1192 - val\_accuracy: 0.9562 - lr: 1.0000e-04

Epoch 11/100

55/55 [==============================] - 46s 842ms/step - loss: 0.0019 - accuracy: 1.0000 - val\_loss: 0.1186 - val\_accuracy: 0.9562 - lr: 1.0000e-04

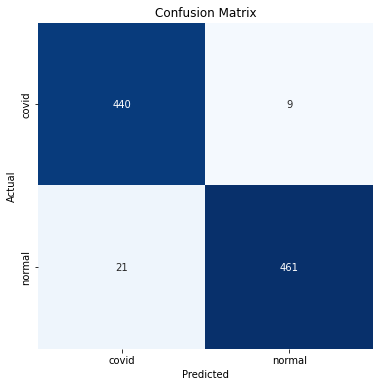
INFO:tensorflow:Assets written to: /content/drive/MyDrive/InceptionV3Split0.7noAug/assets

Test Loss: 0.12064

Test Accuracy: 96.78%

/usr/local/lib/python3.7/dist-packages/ipykernel\_launcher.py:123: DeprecationWarning: `np.int` is a deprecated alias for the builtin `int`. To silence this warning, use `int` by itself. Doing this will not modify any behavior and is safe. When replacing `np.int`, you may wish to use e.g. `np.int64` or `np.int32` to specify the precision. If you wish to review your current use, check the release note link for additional information.

Deprecated in NumPy 1.20; for more details and guidance: <https://numpy.org/devdocs/release/1.20.0-notes.html#deprecations>



Classification Report:

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precision recall f1-score support

covid 0.95 0.98 0.97 449

normal 0.98 0.96 0.97 482

accuracy 0.97 931

macro avg 0.97 0.97 0.97 931

weighted avg 0.97 0.97 0.97 931

