

File - model\_summary

```
1 G:\Anaconda3\envs\dlml\python.exe F:/FSR/SNIKO_Paper/
model_summary.py
2 2018-12-10 01:22:20.609843: I tensorflow/core/platform/
cpu_feature_guard.cc:141] Your CPU supports instructions
that this TensorFlow binary was not compiled to use: AVX2
3 2018-12-10 01:22:21.536873: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:1411] Found device 0 with
properties:
4 name: GeForce 940M major: 5 minor: 0 memoryClockRate(GHz)
): 1.176
5 pciBusID: 0000:04:00.0
6 totalMemory: 2.00GiB freeMemory: 1.65GiB
7 2018-12-10 01:22:21.537555: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:1490] Adding visible gpu
devices: 0
8 2018-12-10 01:22:24.445027: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:971] Device interconnect
StreamExecutor with strength 1 edge matrix:
9 2018-12-10 01:22:24.445355: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:977]          0
10 2018-12-10 01:22:24.445558: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:990] 0:      N
11 2018-12-10 01:22:24.446020: I tensorflow/core/
common_runtime/gpu/gpu_device.cc:1103] Created TensorFlow
device (/job:localhost/replica:0/task:0/device:GPU:0 with
1402 MB memory) → physical GPU (device: 0, name: GeForce
940M, pci bus id: 0000:04:00.0, compute capability: 5.0)
12 mobilenet
13 -----
14 Layer (type)           Output Shape
15 Param #
16 =====
17 =====
18 input_1 (InputLayer)   (None, 224, 224, 3)      0
19 -----
20 conv1_pad (ZeroPadding2D) (None, 225, 225, 3)      0
21 -----
22 conv1 (Conv2D)          (None, 112, 112, 32)     864
23 -----
```

File - model\_summary

23 -----  
24 conv1\_relu (ReLU) (None, 112, 112, 32) 0  
25 -----  
26 conv\_dw\_1 (DepthwiseConv2D) (None, 112, 112, 32) 288  
27 -----  
28 conv\_dw\_1\_bn (BatchNormaliza (None, 112, 112, 32) 128  
29 -----  
30 conv\_dw\_1\_relu (ReLU) (None, 112, 112, 32) 0  
31 -----  
32 conv\_pw\_1 (Conv2D) (None, 112, 112, 64)  
2048  
33 -----  
34 conv\_pw\_1\_bn (BatchNormaliza (None, 112, 112, 64) 256  
35 -----  
36 conv\_pw\_1\_relu (ReLU) (None, 112, 112, 64) 0  
37 -----  
38 conv\_pad\_2 (ZeroPadding2D) (None, 113, 113, 64) 0  
39 -----  
40 conv\_dw\_2 (DepthwiseConv2D) (None, 56, 56, 64) 576  
41 -----  
42 conv\_dw\_2\_bn (BatchNormaliza (None, 56, 56, 64) 256  
43 -----  
44 conv\_dw\_2\_relu (ReLU) (None, 56, 56, 64) 0  
45 -----  
46 conv\_pw\_2 (Conv2D) (None, 56, 56, 128)  
8192  
47 -----  
-----

File - model\_summary

48	conv_pw_2_bn (BatchNormaliza	(None, 56, 56, 128)	512
49	-----		
50	conv_pw_2_relu (ReLU)	(None, 56, 56, 128)	0
51	-----		
52	conv_dw_3 (DepthwiseConv2D)	(None, 56, 56, 128)	1152
53	-----		
54	conv_dw_3_bn (BatchNormaliza	(None, 56, 56, 128)	512
55	-----		
56	conv_dw_3_relu (ReLU)	(None, 56, 56, 128)	0
57	-----		
58	conv_pw_3 (Conv2D)	(None, 56, 56, 128)	16384
59	-----		
60	conv_pw_3_bn (BatchNormaliza	(None, 56, 56, 128)	512
61	-----		
62	conv_pw_3_relu (ReLU)	(None, 56, 56, 128)	0
63	-----		
64	conv_pad_4 (ZeroPadding2D)	(None, 57, 57, 128)	0
65	-----		
66	conv_dw_4 (DepthwiseConv2D)	(None, 28, 28, 128)	1152
67	-----		
68	conv_dw_4_bn (BatchNormaliza	(None, 28, 28, 128)	512
69	-----		
70	conv_dw_4_relu (ReLU)	(None, 28, 28, 128)	0
71	-----		
72	conv_pw_4 (Conv2D)	(None, 28, 28, 256)	

File - model\_summary

72 32768

73 -----

74 conv\_pw\_4\_bn (BatchNormaliza (None, 28, 28, 256)  
1024

75 -----

76 conv\_pw\_4\_relu (ReLU) (None, 28, 28, 256) 0

77 -----

78 conv\_dw\_5 (DepthwiseConv2D) (None, 28, 28, 256)  
2304

79 -----

80 conv\_dw\_5\_bn (BatchNormaliza (None, 28, 28, 256)  
1024

81 -----

82 conv\_dw\_5\_relu (ReLU) (None, 28, 28, 256) 0

83 -----

84 conv\_pw\_5 (Conv2D) (None, 28, 28, 256)  
65536

85 -----

86 conv\_pw\_5\_bn (BatchNormaliza (None, 28, 28, 256)  
1024

87 -----

88 conv\_pw\_5\_relu (ReLU) (None, 28, 28, 256) 0

89 -----

90 conv\_pad\_6 (ZeroPadding2D) (None, 29, 29, 256) 0

91 -----

92 conv\_dw\_6 (DepthwiseConv2D) (None, 14, 14, 256)  
2304

93 -----

94 conv\_dw\_6\_bn (BatchNormaliza (None, 14, 14, 256)  
1024

95 -----

96 conv\_dw\_6\_relu (ReLU) (None, 14, 14, 256) 0

File - model\_summary

97 -----  
98 conv\_pw\_6 (Conv2D) (None, 14, 14, 512)  
131072  
99 -----  
100 conv\_pw\_6\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
101 -----  
102 conv\_pw\_6\_relu (ReLU) (None, 14, 14, 512) 0  
103 -----  
104 conv\_dw\_7 (DepthwiseConv2D) (None, 14, 14, 512)  
4608  
105 -----  
106 conv\_dw\_7\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
107 -----  
108 conv\_dw\_7\_relu (ReLU) (None, 14, 14, 512) 0  
109 -----  
110 conv\_pw\_7 (Conv2D) (None, 14, 14, 512)  
262144  
111 -----  
112 conv\_pw\_7\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
113 -----  
114 conv\_pw\_7\_relu (ReLU) (None, 14, 14, 512) 0  
115 -----  
116 conv\_dw\_8 (DepthwiseConv2D) (None, 14, 14, 512)  
4608  
117 -----  
118 conv\_dw\_8\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
119 -----  
120 conv\_dw\_8\_relu (ReLU) (None, 14, 14, 512) 0  
121 -----

File - model\_summary

121 -----  
122 conv\_pw\_8 (Conv2D) (None, 14, 14, 512)  
262144  
123 -----  
124 conv\_pw\_8\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
125 -----  
126 conv\_pw\_8\_relu (ReLU) (None, 14, 14, 512) 0  
127 -----  
128 conv\_dw\_9 (DepthwiseConv2D) (None, 14, 14, 512)  
4608  
129 -----  
130 conv\_dw\_9\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
131 -----  
132 conv\_dw\_9\_relu (ReLU) (None, 14, 14, 512) 0  
133 -----  
134 conv\_pw\_9 (Conv2D) (None, 14, 14, 512)  
262144  
135 -----  
136 conv\_pw\_9\_bn (BatchNormaliza (None, 14, 14, 512)  
2048  
137 -----  
138 conv\_pw\_9\_relu (ReLU) (None, 14, 14, 512) 0  
139 -----  
140 conv\_dw\_10 (DepthwiseConv2D) (None, 14, 14, 512)  
4608  
141 -----  
142 conv\_dw\_10\_bn (BatchNormaliz (None, 14, 14, 512)  
2048  
143 -----  
144 conv\_dw\_10\_relu (ReLU) (None, 14, 14, 512) 0  
145 -----  
-----

File - model\_summary

146 conv\_pw\_10 (Conv2D) (None, 14, 14, 512)  
262144

147 -----

148 conv\_pw\_10\_bn (BatchNormaliz (None, 14, 14, 512)  
2048

149 -----

150 conv\_pw\_10\_relu (ReLU) (None, 14, 14, 512) 0

151 -----

152 conv\_dw\_11 (DepthwiseConv2D) (None, 14, 14, 512)  
4608

153 -----

154 conv\_dw\_11\_bn (BatchNormaliz (None, 14, 14, 512)  
2048

155 -----

156 conv\_dw\_11\_relu (ReLU) (None, 14, 14, 512) 0

157 -----

158 conv\_pw\_11 (Conv2D) (None, 14, 14, 512)  
262144

159 -----

160 conv\_pw\_11\_bn (BatchNormaliz (None, 14, 14, 512)  
2048

161 -----

162 conv\_pw\_11\_relu (ReLU) (None, 14, 14, 512) 0

163 -----

164 conv\_pad\_12 (ZeroPadding2D) (None, 15, 15, 512) 0

165 -----

166 conv\_dw\_12 (DepthwiseConv2D) (None, 7, 7, 512)  
4608

167 -----

168 conv\_dw\_12\_bn (BatchNormaliz (None, 7, 7, 512)  
2048

169 -----

170 conv\_dw\_12\_relu (ReLU) (None, 7, 7, 512) 0

File - model\_summary

170

171 -----

172 conv\_pw\_12 (Conv2D) (None, 7, 7, 1024)  
524288

173 -----

174 conv\_pw\_12\_bn (BatchNormaliz (None, 7, 7, 1024)  
4096

175 -----

176 conv\_pw\_12\_relu (ReLU) (None, 7, 7, 1024) 0

177 -----

178 conv\_dw\_13 (DepthwiseConv2D) (None, 7, 7, 1024)  
9216

179 -----

180 conv\_dw\_13\_bn (BatchNormaliz (None, 7, 7, 1024)  
4096

181 -----

182 conv\_dw\_13\_relu (ReLU) (None, 7, 7, 1024) 0

183 -----

184 conv\_pw\_13 (Conv2D) (None, 7, 7, 1024)  
1048576

185 -----

186 conv\_pw\_13\_bn (BatchNormaliz (None, 7, 7, 1024)  
4096

187 -----

188 conv\_pw\_13\_relu (ReLU) (None, 7, 7, 1024) 0

189 -----

190 global\_average\_pooling2d (Gl (None, 1024) 0

191 -----

192 reshape\_1 (Reshape) (None, 1, 1, 1024) 0

193 -----

194 dropout (Dropout) (None, 1, 1, 1024) 0

```

File - model_summary
195 -----
196 conv_preds (Conv2D)           (None, 1, 1, 1000)
1025000
197 -----
198 act_softmax (Activation)    (None, 1, 1, 1000)      0
199 -----
200 reshape_2 (Reshape)         (None, 1000)          0
201 =====
=====
202 Total params: 4,253,864
203 Trainable params: 4,231,976
204 Non-trainable params: 21,888
205 -----
206 None
207 =====
208 mobilenet_v2
209 -----
210 Layer (type)                Output Shape
   Param #     Connected to
211 =====
=====
212 input_2 (InputLayer)        (None, 224, 224, 3)  0
213 -----
214 Conv1_pad (ZeroPadding2D)    (None, 225, 225, 3)  0
   input_2[0][0]
215 -----
216 Conv1 (Conv2D)              (None, 112, 112, 32) 864
   Conv1_pad[0][0]
217 -----
218 bn_Conv1 (BatchNormalization) (None, 112, 112, 32) 128
   Conv1[0][0]
219 -----
220 Conv1_relu (ReLU)           (None, 112, 112, 32) 0
   bn_Conv1[0][0]
221 -----
222 expanded_conv_depthwise (Depthw (None, 112, 112, 32) 288

```

File - model\_summary

222 Conv1\_relu[0][0]  
223 -----  
224 expanded\_conv\_depthwise\_BN (Batch (None, 112, 112, 32) 128  
expanded\_conv\_depthwise[0][0]  
225 -----  
226 expanded\_conv\_depthwise\_relu (ReLU (None, 112, 112, 32) 0  
expanded\_conv\_depthwise\_BN[0][0]  
227 -----  
228 expanded\_conv\_project (Conv2D) (None, 112, 112, 16) 512  
expanded\_conv\_depthwise\_relu[0][0]  
229 -----  
230 expanded\_conv\_project\_BN (Batch (None, 112, 112, 16) 64  
expanded\_conv\_project[0][0]  
231 -----  
232 block\_1\_expand (Conv2D) (None, 112, 112, 96) 1536  
expanded\_conv\_project\_BN[0][0]  
233 -----  
234 block\_1\_expand\_BN (BatchNormali (None, 112, 112, 96) 384  
block\_1\_expand[0][0]  
235 -----  
236 block\_1\_expand\_relu (ReLU) (None, 112, 112, 96) 0  
block\_1\_expand\_BN[0][0]  
237 -----  
238 block\_1\_pad (ZeroPadding2D) (None, 113, 113, 96) 0  
block\_1\_expand\_relu[0][0]  
239 -----  
240 block\_1\_depthwise (DepthwiseCon (None, 56, 56, 96) 864  
block\_1\_pad[0][0]  
241 -----  
242 block\_1\_depthwise\_BN (BatchNorm (None, 56, 56, 96) 384  
block\_1\_depthwise[0][0]  
243 -----  
244 block\_1\_depthwise\_relu (ReLU) (None, 56, 56, 96) 0  
block\_1\_depthwise\_BN[0][0]  
245 -----  
246 block\_1\_project (Conv2D) (None, 56, 56, 24) 2304  
block\_1\_depthwise\_relu[0][0]

File - model\_summary

247 -----

248 block\_1\_project\_BN (BatchNormal (None, 56, 56, 24) 96  
block\_1\_project[0][0]

249 -----

250 block\_2\_expand (Conv2D) (None, 56, 56, 144) 3456  
block\_1\_project\_BN[0][0]

251 -----

252 block\_2\_expand\_BN (BatchNormali (None, 56, 56, 144) 576  
block\_2\_expand[0][0]

253 -----

254 block\_2\_expand\_relu (ReLU) (None, 56, 56, 144) 0  
block\_2\_expand\_BN[0][0]

255 -----

256 block\_2\_depthwise (DepthwiseCon (None, 56, 56, 144) 1296  
block\_2\_expand\_relu[0][0]

257 -----

258 block\_2\_depthwise\_BN (BatchNorm (None, 56, 56, 144) 576  
block\_2\_depthwise[0][0]

259 -----

260 block\_2\_depthwise\_relu (ReLU) (None, 56, 56, 144) 0  
block\_2\_depthwise\_BN[0][0]

261 -----

262 block\_2\_project (Conv2D) (None, 56, 56, 24) 3456  
block\_2\_depthwise\_relu[0][0]

263 -----

264 block\_2\_project\_BN (BatchNormal (None, 56, 56, 24) 96  
block\_2\_project[0][0]

265 -----

266 block\_2\_add (Add) (None, 56, 56, 24) 0  
block\_1\_project\_BN[0][0]

267  
block\_2\_project\_BN[0][0]

268 -----

269 block\_3\_expand (Conv2D) (None, 56, 56, 144) 3456  
block\_2\_add[0][0]

270 -----

271 block\_3\_expand\_BN (BatchNormali (None, 56, 56, 144) 576

File - model\_summary

271           block\_3\_expand[0][0]  
272 -----  
273 block\_3\_expand\_relu (ReLU)        (None, 56, 56, 144)  0  
            block\_3\_expand\_BN[0][0]  
274 -----  
275 block\_3\_pad (ZeroPadding2D)      (None, 57, 57, 144)  0  
            block\_3\_expand\_relu[0][0]  
276 -----  
277 block\_3\_depthwise (DepthwiseCon (None, 28, 28, 144)  1296  
            block\_3\_pad[0][0]  
278 -----  
279 block\_3\_depthwise\_BN (BatchNorm (None, 28, 28, 144)  576  
            block\_3\_depthwise[0][0]  
280 -----  
281 block\_3\_depthwise\_relu (ReLU)    (None, 28, 28, 144)  0  
            block\_3\_depthwise\_BN[0][0]  
282 -----  
283 block\_3\_project (Conv2D)         (None, 28, 28, 32)   4608  
            block\_3\_depthwise\_relu[0][0]  
284 -----  
285 block\_3\_project\_BN (BatchNormal (None, 28, 28, 32)   128  
            block\_3\_project[0][0]  
286 -----  
287 block\_4\_expand (Conv2D)         (None, 28, 28, 192)  6144  
            block\_3\_project\_BN[0][0]  
288 -----  
289 block\_4\_expand\_BN (BatchNormali (None, 28, 28, 192)  768  
            block\_4\_expand[0][0]  
290 -----  
291 block\_4\_expand\_relu (ReLU)      (None, 28, 28, 192)  0  
            block\_4\_expand\_BN[0][0]  
292 -----  
293 block\_4\_depthwise (DepthwiseCon (None, 28, 28, 192)  1728  
            block\_4\_expand\_relu[0][0]  
294 -----  
295 block\_4\_depthwise\_BN (BatchNorm (None, 28, 28, 192)  768  
            block\_4\_depthwise[0][0]

File - model\_summary

296 -----

297 block\_4\_depthwise\_relu (ReLU) (None, 28, 28, 192) 0  
block\_4\_depthwise\_BN[0][0]

298 -----

299 block\_4\_project (Conv2D) (None, 28, 28, 32) 6144  
block\_4\_depthwise\_relu[0][0]

300 -----

301 block\_4\_project\_BN (BatchNormal (None, 28, 28, 32) 128  
block\_4\_project[0][0]

302 -----

303 block\_4\_add (Add) (None, 28, 28, 32) 0  
block\_3\_project\_BN[0][0]

304  
block\_4\_project\_BN[0][0]

305 -----

306 block\_5\_expand (Conv2D) (None, 28, 28, 192) 6144  
block\_4\_add[0][0]

307 -----

308 block\_5\_expand\_BN (BatchNormali (None, 28, 28, 192) 768  
block\_5\_expand[0][0]

309 -----

310 block\_5\_expand\_relu (ReLU) (None, 28, 28, 192) 0  
block\_5\_expand\_BN[0][0]

311 -----

312 block\_5\_depthwise (DepthwiseCon (None, 28, 28, 192) 1728  
block\_5\_expand\_relu[0][0]

313 -----

314 block\_5\_depthwise\_BN (BatchNorm (None, 28, 28, 192) 768  
block\_5\_depthwise[0][0]

315 -----

316 block\_5\_depthwise\_relu (ReLU) (None, 28, 28, 192) 0  
block\_5\_depthwise\_BN[0][0]

317 -----

318 block\_5\_project (Conv2D) (None, 28, 28, 32) 6144  
block\_5\_depthwise\_relu[0][0]

319 -----

320 block\_5\_project\_BN (BatchNormal (None, 28, 28, 32) 128

File - model\_summary

320           block\_5\_project[0][0]  
321 \_\_\_\_\_

322 block\_5\_add (Add)                            (None, 28, 28, 32)    0  
      block\_4\_add[0][0]

323           block\_5\_project\_BN[0][0]  
324 \_\_\_\_\_

325 block\_6\_expand (Conv2D)                    (None, 28, 28, 192)  6144  
      block\_5\_add[0][0]

326 \_\_\_\_\_

327 block\_6\_expand\_BN (BatchNormali (None, 28, 28, 192)  768  
      block\_6\_expand[0][0]

328 \_\_\_\_\_

329 block\_6\_expand\_relu (ReLU)                  (None, 28, 28, 192)  0  
      block\_6\_expand\_BN[0][0]

330 \_\_\_\_\_

331 block\_6\_pad (ZeroPadding2D)                (None, 29, 29, 192)  0  
      block\_6\_expand\_relu[0][0]

332 \_\_\_\_\_

333 block\_6\_depthwise (DepthwiseCon (None, 14, 14, 192)  1728  
      block\_6\_pad[0][0]

334 \_\_\_\_\_

335 block\_6\_depthwise\_BN (BatchNorm (None, 14, 14, 192)  768  
      block\_6\_depthwise[0][0]

336 \_\_\_\_\_

337 block\_6\_depthwise\_relu (ReLU)             (None, 14, 14, 192)  0  
      block\_6\_depthwise\_BN[0][0]

338 \_\_\_\_\_

339 block\_6\_project (Conv2D)                  (None, 14, 14, 64)  
      12288        block\_6\_depthwise\_relu[0][0]

340 \_\_\_\_\_

341 block\_6\_project\_BN (BatchNormal (None, 14, 14, 64)  256  
      block\_6\_project[0][0]

342 \_\_\_\_\_

343 block\_7\_expand (Conv2D)                  (None, 14, 14, 384)  
      24576        block\_6\_project\_BN[0][0]

344 \_\_\_\_\_

-----

File - model\_summary

345 block\_7\_expand\_BN (BatchNormali (None, 14, 14, 384) 1536  
346       block\_7\_expand[0][0]  
346 -----  
347 block\_7\_expand\_relu (ReLU) (None, 14, 14, 384) 0  
348       block\_7\_expand\_BN[0][0]  
348 -----  
349 block\_7\_depthwise (DepthwiseCon (None, 14, 14, 384) 3456  
349       block\_7\_expand\_relu[0][0]  
350 -----  
351 block\_7\_depthwise\_BN (BatchNorm (None, 14, 14, 384) 1536  
351       block\_7\_depthwise[0][0]  
352 -----  
353 block\_7\_depthwise\_relu (ReLU) (None, 14, 14, 384) 0  
353       block\_7\_depthwise\_BN[0][0]  
354 -----  
355 block\_7\_project (Conv2D) (None, 14, 14, 64)  
355       24576       block\_7\_depthwise\_relu[0][0]  
356 -----  
357 block\_7\_project\_BN (BatchNormal (None, 14, 14, 64) 256  
357       block\_7\_project[0][0]  
358 -----  
359 block\_7\_add (Add) (None, 14, 14, 64) 0  
359       block\_6\_project\_BN[0][0]  
360  
360       block\_7\_project\_BN[0][0]  
361 -----  
362 block\_8\_expand (Conv2D) (None, 14, 14, 384)  
362       24576       block\_7\_add[0][0]  
363 -----  
364 block\_8\_expand\_BN (BatchNormali (None, 14, 14, 384) 1536  
364       block\_8\_expand[0][0]  
365 -----  
366 block\_8\_expand\_relu (ReLU) (None, 14, 14, 384) 0  
366       block\_8\_expand\_BN[0][0]  
367 -----  
368 block\_8\_depthwise (DepthwiseCon (None, 14, 14, 384) 3456  
368       block\_8\_expand\_relu[0][0]  
369 -----

File - model\_summary

369 -----  
370 block\_8\_depthwise\_BN (BatchNorm (None, 14, 14, 384) 1536  
371       block\_8\_depthwise[0][0]  
372 -----  
373 block\_8\_depthwise\_relu (ReLU) (None, 14, 14, 384) 0  
374       block\_8\_depthwise\_BN[0][0]  
375 -----  
376 block\_8\_project (Conv2D) (None, 14, 14, 64)  
377       24576       block\_8\_depthwise\_relu[0][0]  
378 -----  
379 block\_8\_add (Add) (None, 14, 14, 64) 0  
380       block\_7\_add[0][0]  
381       block\_8\_project\_BN[0][0]  
382 -----  
383 block\_9\_expand (Conv2D) (None, 14, 14, 384)  
384       24576       block\_8\_add[0][0]  
385 -----  
386 block\_9\_expand\_BN (BatchNormali (None, 14, 14, 384) 1536  
387       block\_9\_expand[0][0]  
388 -----  
389 block\_9\_depthwise (DepthwiseCon (None, 14, 14, 384) 3456  
390       block\_9\_expand\_relu[0][0]  
391 -----  
392 block\_9\_depthwise\_BN (BatchNorm (None, 14, 14, 384) 1536  
393       block\_9\_depthwise[0][0]  
394       block\_9\_depthwise\_relu[0][0]  
395 -----  
396 block\_9\_project (Conv2D) (None, 14, 14, 64)  
397       24576       block\_9\_depthwise\_relu[0][0]

File - model\_summary

394 -----

395 block\_9\_project\_BN (BatchNormal (None, 14, 14, 64) 256  
                      block\_9\_project[0][0]

396 -----

397 block\_9\_add (Add) (None, 14, 14, 64) 0  
                      block\_8\_add[0][0]

398  
                      block\_9\_project\_BN[0][0]

399 -----

400 block\_10\_expand (Conv2D) (None, 14, 14, 384)  
24576       block\_9\_add[0][0]

401 -----

402 block\_10\_expand\_BN (BatchNormal (None, 14, 14, 384) 1536  
                      block\_10\_expand[0][0]

403 -----

404 block\_10\_expand\_relu (ReLU) (None, 14, 14, 384) 0  
                      block\_10\_expand\_BN[0][0]

405 -----

406 block\_10\_depthwise (DepthwiseCo (None, 14, 14, 384) 3456  
                      block\_10\_expand\_relu[0][0]

407 -----

408 block\_10\_depthwise\_BN (BatchNor (None, 14, 14, 384) 1536  
                      block\_10\_depthwise[0][0]

409 -----

410 block\_10\_depthwise\_relu (ReLU) (None, 14, 14, 384) 0  
                      block\_10\_depthwise\_BN[0][0]

411 -----

412 block\_10\_project (Conv2D) (None, 14, 14, 96)  
36864       block\_10\_depthwise\_relu[0][0]

413 -----

414 block\_10\_project\_BN (BatchNorma (None, 14, 14, 96) 384  
                      block\_10\_project[0][0]

415 -----

416 block\_11\_expand (Conv2D) (None, 14, 14, 576)  
55296       block\_10\_project\_BN[0][0]

417 -----

418 block\_11\_expand\_BN (BatchNormal (None, 14, 14, 576) 2304

File - model\_summary

```
418         block_11_expand[0][0]
419 -----
420 block_11_expand_relu (ReLU)      (None, 14, 14, 576)  0
421             block_11_expand_BN[0][0]
422 -----
423 block_11_depthwise (DepthwiseCo (None, 14, 14, 576)  5184
424             block_11_expand_relu[0][0]
425 -----
426 block_11_depthwise_BN (BatchNor (None, 14, 14, 576)  2304
427             block_11_depthwise[0][0]
428 -----
429 block_11_project (Conv2D)      (None, 14, 14, 96)
430             55296      block_11_depthwise_relu[0][0]
431 -----
432 block_11_add (Add)           (None, 14, 14, 96)  0
433             block_11_depthwise_BN[0][0]
434 -----
435 block_12_expand (Conv2D)      (None, 14, 14, 576)
436             55296      block_11_add[0][0]
437 -----
438 block_12_expand_BN (BatchNormal (None, 14, 14, 576)  2304
439             block_12_expand[0][0]
440 -----
441 block_12_depthwise (DepthwiseCo (None, 14, 14, 576)  5184
442             block_12_expand_relu[0][0]
```

File - model\_summary

```
443 block_12_depthwise_BN (BatchNor (None, 14, 14, 576) 2304
      block_12_depthwise[0][0]
444 -----
445 block_12_depthwise_relu (ReLU) (None, 14, 14, 576) 0
      block_12_depthwise_BN[0][0]
446 -----
447 block_12_project (Conv2D) (None, 14, 14, 96)
      55296      block_12_depthwise_relu[0][0]
448 -----
449 block_12_project_BN (BatchNorma (None, 14, 14, 96) 384
      block_12_project[0][0]
450 -----
451 block_12_add (Add) (None, 14, 14, 96) 0
      block_11_add[0][0]
452
      block_12_project_BN[0][0]
453 -----
454 block_13_expand (Conv2D) (None, 14, 14, 576)
      55296      block_12_add[0][0]
455 -----
456 block_13_expand_BN (BatchNormal (None, 14, 14, 576) 2304
      block_13_expand[0][0]
457 -----
458 block_13_expand_relu (ReLU) (None, 14, 14, 576) 0
      block_13_expand_BN[0][0]
459 -----
460 block_13_pad (ZeroPadding2D) (None, 15, 15, 576) 0
      block_13_expand_relu[0][0]
461 -----
462 block_13_depthwise (DepthwiseCo (None, 7, 7, 576) 5184
      block_13_pad[0][0]
463 -----
464 block_13_depthwise_BN (BatchNor (None, 7, 7, 576) 2304
      block_13_depthwise[0][0]
465 -----
466 block_13_depthwise_relu (ReLU) (None, 7, 7, 576) 0
      block_13_depthwise_BN[0][0]
467 -----
```

File - model\_summary

```
467 -----
468 block_13_project (Conv2D)      (None, 7, 7, 160)
469     92160      block_13_depthwise_relu[0][0]
470 -----
471 block_13_project_BN (BatchNorma (None, 7, 7, 160)      640
472     block_13_project[0][0]
473 -----
474 block_14_expand (Conv2D)      (None, 7, 7, 960)
475     153600      block_13_project_BN[0][0]
476 -----
477 block_14_expand_BN (BatchNormal (None, 7, 7, 960)      3840
478     block_14_expand[0][0]
479 -----
480 block_14_depthwise (DepthwiseCo (None, 7, 7, 960)      8640
481     block_14_expand_relu[0][0]
482 -----
483 block_14_depthwise_BN (BatchNor (None, 7, 7, 960)      3840
484     block_14_depthwise[0][0]
485 -----
486 block_14_project (Conv2D)      (None, 7, 7, 160)
487     153600      block_14_depthwise_relu[0][0]
488 -----
489 block_14_project_BN (BatchNorma (None, 7, 7, 160)      640
490     block_14_project[0][0]
491 -----
492 block_15_expand (Conv2D)      (None, 7, 7, 960)
493     153600      block_14_add[0][0]
```

File - model\_summary

492 -----

493 block\_15\_expand\_BN (BatchNormal (None, 7, 7, 960) 3840  
block\_15\_expand[0][0]

494 -----

495 block\_15\_expand\_relu (ReLU) (None, 7, 7, 960) 0  
block\_15\_expand\_BN[0][0]

496 -----

497 block\_15\_depthwise (DepthwiseCo (None, 7, 7, 960) 8640  
block\_15\_expand\_relu[0][0]

498 -----

499 block\_15\_depthwise\_BN (BatchNor (None, 7, 7, 960) 3840  
block\_15\_depthwise[0][0]

500 -----

501 block\_15\_depthwise\_relu (ReLU) (None, 7, 7, 960) 0  
block\_15\_depthwise\_BN[0][0]

502 -----

503 block\_15\_project (Conv2D) (None, 7, 7, 160)  
153600 block\_15\_depthwise\_relu[0][0]

504 -----

505 block\_15\_project\_BN (BatchNorma (None, 7, 7, 160) 640  
block\_15\_project[0][0]

506 -----

507 block\_15\_add (Add) (None, 7, 7, 160) 0  
block\_14\_add[0][0]

508 -----

509 block\_15\_project\_BN[0][0]

510 -----

510 block\_16\_expand (Conv2D) (None, 7, 7, 960)  
153600 block\_15\_add[0][0]

511 -----

512 block\_16\_expand\_BN (BatchNormal (None, 7, 7, 960) 3840  
block\_16\_expand[0][0]

513 -----

514 block\_16\_expand\_relu (ReLU) (None, 7, 7, 960) 0  
block\_16\_expand\_BN[0][0]

515 -----

516 block\_16\_depthwise (DepthwiseCo (None, 7, 7, 960) 8640

```
File - model_summary
516           block_16_expand_relu[0][0]
517 -----
518   block_16_depthwise_BN (BatchNor (None, 7, 7, 960)      3840
519     block_16_depthwise[0][0]
520   block_16_depthwise_relu (ReLU)  (None, 7, 7, 960)      0
521     block_16_depthwise_BN[0][0]
522   block_16_project (Conv2D)      (None, 7, 7, 320)
523     307200      block_16_depthwise_relu[0][0]
524   block_16_project_BN (BatchNorma (None, 7, 7, 320)      1280
525     block_16_project[0][0]
526   Conv_1 (Conv2D)              (None, 7, 7, 1280)
527     409600      block_16_project_BN[0][0]
528   Conv_1_bn (BatchNormalization) (None, 7, 7, 1280)      5120
529     Conv_1[0][0]
530   out_relu (ReLU)             (None, 7, 7, 1280)      0
531     Conv_1_bn[0][0]
532   global_average_pooling2d_1 (Glo (None, 1280)          0
533     out_relu[0][0]
534   Logits (Dense)            (None, 1000)
535     1281000      global_average_pooling2d_1[0][0]
536 =====
537 =====
538 Total params: 3,538,984
539 Trainable params: 3,504,872
540 Non-trainable params: 34,112
541 =====
542 None
543 =====
```

File - model\_summary

Layer (type)	Output Shape
Param #	Connected to
545 -----	=====
546 input_3 (InputLayer)	(None, None, None, 3 0)
547 -----	
548 conv2d (Conv2D) input_3[0][0]	(None, None, None, 3 864)
549 -----	
550 batch_normalization (BatchNorma conv2d[0][0])	(None, None, None, 3 96)
551 -----	
552 activation (Activation) batch_normalization[0][0]	(None, None, None, 3 0)
553 -----	
554 conv2d_1 (Conv2D) activation[0][0]	(None, None, None, 3 9216)
555 -----	
556 batch_normalization_1 (BatchNor conv2d_1[0][0])	(None, None, None, 3 96)
557 -----	
558 activation_1 (Activation) batch_normalization_1[0][0]	(None, None, None, 3 0)
559 -----	
560 conv2d_2 (Conv2D) 18432 activation_1[0][0]	(None, None, None, 6
561 -----	
562 batch_normalization_2 (BatchNor conv2d_2[0][0])	(None, None, None, 6 192)
563 -----	
564 activation_2 (Activation) batch_normalization_2[0][0]	(None, None, None, 6 0)
565 -----	
566 max_pooling2d (MaxPooling2D) activation_2[0][0]	(None, None, None, 6 0)
567 -----	
568 conv2d_3 (Conv2D)	(None, None, None, 8 5120)

File - model\_summary

568 max\_pooling2d[0][0]  
569 -----  
570 batch\_normalization\_3 (BatchNor (None, None, None, 8 240  
conv2d\_3[0][0])  
571 -----  
572 activation\_3 (Activation) (None, None, None, 8 0  
batch\_normalization\_3[0][0])  
573 -----  
574 conv2d\_4 (Conv2D) (None, None, None, 1  
138240 activation\_3[0][0])  
575 -----  
576 batch\_normalization\_4 (BatchNor (None, None, None, 1 576  
conv2d\_4[0][0])  
577 -----  
578 activation\_4 (Activation) (None, None, None, 1 0  
batch\_normalization\_4[0][0])  
579 -----  
580 max\_pooling2d\_1 (MaxPooling2D) (None, None, None, 1 0  
activation\_4[0][0])  
581 -----  
582 conv2d\_8 (Conv2D) (None, None, None, 6  
12288 max\_pooling2d\_1[0][0])  
583 -----  
584 batch\_normalization\_8 (BatchNor (None, None, None, 6 192  
conv2d\_8[0][0])  
585 -----  
586 activation\_8 (Activation) (None, None, None, 6 0  
batch\_normalization\_8[0][0])  
587 -----  
588 conv2d\_6 (Conv2D) (None, None, None, 4 9216  
max\_pooling2d\_1[0][0])  
589 -----  
590 conv2d\_9 (Conv2D) (None, None, None, 9  
55296 activation\_8[0][0])  
591 -----  
592 batch\_normalization\_6 (BatchNor (None, None, None, 4 144  
conv2d\_6[0][0])

File - model\_summary

593 -----

594 batch\_normalization\_9 (BatchNor (None, None, None, 9 288  
conv2d\_9[0][0]

595 -----

596 activation\_6 (Activation) (None, None, None, 4 0  
batch\_normalization\_6[0][0]

597 -----

598 activation\_9 (Activation) (None, None, None, 9 0  
batch\_normalization\_9[0][0]

599 -----

600 average\_pooling2d (AveragePooli (None, None, None, 1 0  
max\_pooling2d\_1[0][0]

601 -----

602 conv2d\_5 (Conv2D) (None, None, None, 6  
12288 max\_pooling2d\_1[0][0]

603 -----

604 conv2d\_7 (Conv2D) (None, None, None, 6  
76800 activation\_6[0][0]

605 -----

606 conv2d\_10 (Conv2D) (None, None, None, 9  
82944 activation\_9[0][0]

607 -----

608 conv2d\_11 (Conv2D) (None, None, None, 3 6144  
average\_pooling2d[0][0]

609 -----

610 batch\_normalization\_5 (BatchNor (None, None, None, 6 192  
conv2d\_5[0][0]

611 -----

612 batch\_normalization\_7 (BatchNor (None, None, None, 6 192  
conv2d\_7[0][0]

613 -----

614 batch\_normalization\_10 (BatchNo (None, None, None, 9 288  
conv2d\_10[0][0]

615 -----

616 batch\_normalization\_11 (BatchNo (None, None, None, 3 96  
conv2d\_11[0][0]

617 -----

File - model\_summary

617 -----  
618 activation\_5 (Activation) (None, None, None, 6 0  
batch\_normalization\_5[0][0]  
619 -----  
620 activation\_7 (Activation) (None, None, None, 6 0  
batch\_normalization\_7[0][0]  
621 -----  
622 activation\_10 (Activation) (None, None, None, 9 0  
batch\_normalization\_10[0][0]  
623 -----  
624 activation\_11 (Activation) (None, None, None, 3 0  
batch\_normalization\_11[0][0]  
625 -----  
626 mixed0 (Concatenate) (None, None, None, 2 0  
activation\_5[0][0]  
627 activation\_7[0][0]  
628 activation\_10[0][0]  
629 activation\_11[0][0]  
630 -----  
631 conv2d\_15 (Conv2D) (None, None, None, 6  
16384 mixed0[0][0]  
632 -----  
633 batch\_normalization\_15 (BatchNo (None, None, None, 6 192  
conv2d\_15[0][0]  
634 -----  
635 activation\_15 (Activation) (None, None, None, 6 0  
batch\_normalization\_15[0][0]  
636 -----  
637 conv2d\_13 (Conv2D) (None, None, None, 4  
12288 mixed0[0][0]  
638 -----  
639 conv2d\_16 (Conv2D) (None, None, None, 9  
55296 activation\_15[0][0]  
640 -----  
641 batch\_normalization\_13 (BatchNo (None, None, None, 4 144  
conv2d\_13[0][0]

File - model\_summary

642 -----

643 batch\_normalization\_16 (BatchNo (None, None, None, 9 288  
conv2d\_16[0][0])

644 -----

645 activation\_13 (Activation) (None, None, None, 4 0  
batch\_normalization\_13[0][0])

646 -----

647 activation\_16 (Activation) (None, None, None, 9 0  
batch\_normalization\_16[0][0])

648 -----

649 average\_pooling2d\_1 (AveragePoo (None, None, None, 2 0  
mixed0[0][0])

650 -----

651 conv2d\_12 (Conv2D) (None, None, None, 6  
16384 mixed0[0][0])

652 -----

653 conv2d\_14 (Conv2D) (None, None, None, 6  
76800 activation\_13[0][0])

654 -----

655 conv2d\_17 (Conv2D) (None, None, None, 9  
82944 activation\_16[0][0])

656 -----

657 conv2d\_18 (Conv2D) (None, None, None, 6  
16384 average\_pooling2d\_1[0][0])

658 -----

659 batch\_normalization\_12 (BatchNo (None, None, None, 6 192  
conv2d\_12[0][0])

660 -----

661 batch\_normalization\_14 (BatchNo (None, None, None, 6 192  
conv2d\_14[0][0])

662 -----

663 batch\_normalization\_17 (BatchNo (None, None, None, 9 288  
conv2d\_17[0][0])

664 -----

665 batch\_normalization\_18 (BatchNo (None, None, None, 6 192  
conv2d\_18[0][0])

666 -----

File - model\_summary

666 -----  
667 activation\_12 (Activation) (None, None, None, 6 0  
batch\_normalization\_12[0][0]  
668 -----  
669 activation\_14 (Activation) (None, None, None, 6 0  
batch\_normalization\_14[0][0]  
670 -----  
671 activation\_17 (Activation) (None, None, None, 9 0  
batch\_normalization\_17[0][0]  
672 -----  
673 activation\_18 (Activation) (None, None, None, 6 0  
batch\_normalization\_18[0][0]  
674 -----  
675 mixed1 (Concatenate) (None, None, None, 2 0  
activation\_12[0][0]  
676 activation\_14[0][0]  
677 activation\_17[0][0]  
678 activation\_18[0][0]  
679 -----  
680 conv2d\_22 (Conv2D) (None, None, None, 6  
18432 mixed1[0][0]  
681 -----  
682 batch\_normalization\_22 (BatchNo (None, None, None, 6 192  
conv2d\_22[0][0]  
683 -----  
684 activation\_22 (Activation) (None, None, None, 6 0  
batch\_normalization\_22[0][0]  
685 -----  
686 conv2d\_20 (Conv2D) (None, None, None, 4  
13824 mixed1[0][0]  
687 -----  
688 conv2d\_23 (Conv2D) (None, None, None, 9  
55296 activation\_22[0][0]  
689 -----  
690 batch\_normalization\_20 (BatchNo (None, None, None, 4 144  
conv2d\_20[0][0]

File - model\_summary

691 -----

692 batch\_normalization\_23 (BatchNo (None, None, None, 9 288  
conv2d\_23[0][0])

693 -----

694 activation\_20 (Activation) (None, None, None, 4 0  
batch\_normalization\_20[0][0])

695 -----

696 activation\_23 (Activation) (None, None, None, 9 0  
batch\_normalization\_23[0][0])

697 -----

698 average\_pooling2d\_2 (AveragePoo (None, None, None, 2 0  
mixed1[0][0])

699 -----

700 conv2d\_19 (Conv2D) (None, None, None, 6  
18432 mixed1[0][0])

701 -----

702 conv2d\_21 (Conv2D) (None, None, None, 6  
76800 activation\_20[0][0])

703 -----

704 conv2d\_24 (Conv2D) (None, None, None, 9  
82944 activation\_23[0][0])

705 -----

706 conv2d\_25 (Conv2D) (None, None, None, 6  
18432 average\_pooling2d\_2[0][0])

707 -----

708 batch\_normalization\_19 (BatchNo (None, None, None, 6 192  
conv2d\_19[0][0])

709 -----

710 batch\_normalization\_21 (BatchNo (None, None, None, 6 192  
conv2d\_21[0][0])

711 -----

712 batch\_normalization\_24 (BatchNo (None, None, None, 9 288  
conv2d\_24[0][0])

713 -----

714 batch\_normalization\_25 (BatchNo (None, None, None, 6 192  
conv2d\_25[0][0])

715 -----

File - model\_summary

715 -----  
716 activation\_19 (Activation) (None, None, None, 6 0  
batch\_normalization\_19[0][0]  
717 -----  
718 activation\_21 (Activation) (None, None, None, 6 0  
batch\_normalization\_21[0][0]  
719 -----  
720 activation\_24 (Activation) (None, None, None, 9 0  
batch\_normalization\_24[0][0]  
721 -----  
722 activation\_25 (Activation) (None, None, None, 6 0  
batch\_normalization\_25[0][0]  
723 -----  
724 mixed2 (Concatenate) (None, None, None, 2 0  
activation\_19[0][0]  
725 activation\_21[0][0]  
726 activation\_24[0][0]  
727 activation\_25[0][0]  
728 -----  
729 conv2d\_27 (Conv2D) (None, None, None, 6  
18432 mixed2[0][0]  
730 -----  
731 batch\_normalization\_27 (BatchNo (None, None, None, 6 192  
conv2d\_27[0][0]  
732 -----  
733 activation\_27 (Activation) (None, None, None, 6 0  
batch\_normalization\_27[0][0]  
734 -----  
735 conv2d\_28 (Conv2D) (None, None, None, 9  
55296 activation\_27[0][0]  
736 -----  
737 batch\_normalization\_28 (BatchNo (None, None, None, 9 288  
conv2d\_28[0][0]  
738 -----  
739 activation\_28 (Activation) (None, None, None, 9 0  
batch\_normalization\_28[0][0]

740 -----  
741 conv2d\_26 (Conv2D) (None, None, None, 3  
995328 mixed2[0][0]  
742 -----  
743 conv2d\_29 (Conv2D) (None, None, None, 9  
82944 activation\_28[0][0]  
744 -----  
745 batch\_normalization\_26 (BatchNo (None, None, None, 3 1152  
conv2d\_26[0][0]  
746 -----  
747 batch\_normalization\_29 (BatchNo (None, None, None, 9 288  
conv2d\_29[0][0]  
748 -----  
749 activation\_26 (Activation) (None, None, None, 3 0  
batch\_normalization\_26[0][0]  
750 -----  
751 activation\_29 (Activation) (None, None, None, 9 0  
batch\_normalization\_29[0][0]  
752 -----  
753 max\_pooling2d\_2 (MaxPooling2D) (None, None, None, 2 0  
mixed2[0][0]  
754 -----  
755 mixed3 (Concatenate) (None, None, None, 7 0  
activation\_26[0][0]  
756 activation\_29[0][0]  
757 max\_pooling2d\_2[0][0]  
758 -----  
759 conv2d\_34 (Conv2D) (None, None, None, 1  
98304 mixed3[0][0]  
760 -----  
761 batch\_normalization\_34 (BatchNo (None, None, None, 1 384  
conv2d\_34[0][0]  
762 -----  
763 activation\_34 (Activation) (None, None, None, 1 0  
batch\_normalization\_34[0][0]  
764 -----

File - model\_summary

764 -----  
765 conv2d\_35 (Conv2D) (None, None, None, 1  
114688 activation\_34[0][0]  
766 -----  
767 batch\_normalization\_35 (BatchNo (None, None, None, 1 384  
conv2d\_35[0][0]  
768 -----  
769 activation\_35 (Activation) (None, None, None, 1 0  
batch\_normalization\_35[0][0]  
770 -----  
771 conv2d\_31 (Conv2D) (None, None, None, 1  
98304 mixed3[0][0]  
772 -----  
773 conv2d\_36 (Conv2D) (None, None, None, 1  
114688 activation\_35[0][0]  
774 -----  
775 batch\_normalization\_31 (BatchNo (None, None, None, 1 384  
conv2d\_31[0][0]  
776 -----  
777 batch\_normalization\_36 (BatchNo (None, None, None, 1 384  
conv2d\_36[0][0]  
778 -----  
779 activation\_31 (Activation) (None, None, None, 1 0  
batch\_normalization\_31[0][0]  
780 -----  
781 activation\_36 (Activation) (None, None, None, 1 0  
batch\_normalization\_36[0][0]  
782 -----  
783 conv2d\_32 (Conv2D) (None, None, None, 1  
114688 activation\_31[0][0]  
784 -----  
785 conv2d\_37 (Conv2D) (None, None, None, 1  
114688 activation\_36[0][0]  
786 -----  
787 batch\_normalization\_32 (BatchNo (None, None, None, 1 384  
conv2d\_32[0][0]  
788 -----  
-----

File - model\_summary

789 batch\_normalization\_37 (BatchNo (None, None, None, 1 384  
                              conv2d\_37[0][0])  
790 -----  
791 activation\_32 (Activation) (None, None, None, 1 0  
                              batch\_normalization\_32[0][0])  
792 -----  
793 activation\_37 (Activation) (None, None, None, 1 0  
                              batch\_normalization\_37[0][0])  
794 -----  
795 average\_pooling2d\_3 (AveragePoo (None, None, None, 7 0  
                              mixed3[0][0])  
796 -----  
797 conv2d\_30 (Conv2D) (None, None, None, 1  
147456        mixed3[0][0])  
798 -----  
799 conv2d\_33 (Conv2D) (None, None, None, 1  
172032        activation\_32[0][0])  
800 -----  
801 conv2d\_38 (Conv2D) (None, None, None, 1  
172032        activation\_37[0][0])  
802 -----  
803 conv2d\_39 (Conv2D) (None, None, None, 1  
147456        average\_pooling2d\_3[0][0])  
804 -----  
805 batch\_normalization\_30 (BatchNo (None, None, None, 1 576  
                              conv2d\_30[0][0])  
806 -----  
807 batch\_normalization\_33 (BatchNo (None, None, None, 1 576  
                              conv2d\_33[0][0])  
808 -----  
809 batch\_normalization\_38 (BatchNo (None, None, None, 1 576  
                              conv2d\_38[0][0])  
810 -----  
811 batch\_normalization\_39 (BatchNo (None, None, None, 1 576  
                              conv2d\_39[0][0])  
812 -----  
813 activation\_30 (Activation) (None, None, None, 1 0

File - model\_summary

```
813           batch_normalization_30[0][0]
814 -----
815 activation_33 (Activation)      (None, None, None, 1 0
816           batch_normalization_33[0][0]
816 -----
817 activation_38 (Activation)      (None, None, None, 1 0
818           batch_normalization_38[0][0]
818 -----
819 activation_39 (Activation)      (None, None, None, 1 0
820           batch_normalization_39[0][0]
820 -----
821 mixed4 (Concatenate)          (None, None, None, 7 0
822           activation_30[0][0]
822
823           activation_33[0][0]
823
824           activation_38[0][0]
824
825           activation_39[0][0]
825 -----
826 conv2d_44 (Conv2D)             (None, None, None, 1
827           122880      mixed4[0][0]
827 -----
828 batch_normalization_44 (BatchNo (None, None, None, 1 480
829           conv2d_44[0][0]
829 -----
830 activation_44 (Activation)     (None, None, None, 1 0
831           batch_normalization_44[0][0]
831 -----
832 conv2d_45 (Conv2D)             (None, None, None, 1
833           179200      activation_44[0][0]
833 -----
834 batch_normalization_45 (BatchNo (None, None, None, 1 480
835           conv2d_45[0][0]
835 -----
836 activation_45 (Activation)     (None, None, None, 1 0
837           batch_normalization_45[0][0]
837 -----
```

File - model\_summary

838 conv2d\_41 (Conv2D) (None, None, None, 1  
122880 mixed4[0][0]

839 -----

840 conv2d\_46 (Conv2D) (None, None, None, 1  
179200 activation\_45[0][0]

841 -----

842 batch\_normalization\_41 (BatchNo (None, None, None, 1 480  
conv2d\_41[0][0]

843 -----

844 batch\_normalization\_46 (BatchNo (None, None, None, 1 480  
conv2d\_46[0][0]

845 -----

846 activation\_41 (Activation) (None, None, None, 1 0  
batch\_normalization\_41[0][0]

847 -----

848 activation\_46 (Activation) (None, None, None, 1 0  
batch\_normalization\_46[0][0]

849 -----

850 conv2d\_42 (Conv2D) (None, None, None, 1  
179200 activation\_41[0][0]

851 -----

852 conv2d\_47 (Conv2D) (None, None, None, 1  
179200 activation\_46[0][0]

853 -----

854 batch\_normalization\_42 (BatchNo (None, None, None, 1 480  
conv2d\_42[0][0]

855 -----

856 batch\_normalization\_47 (BatchNo (None, None, None, 1 480  
conv2d\_47[0][0]

857 -----

858 activation\_42 (Activation) (None, None, None, 1 0  
batch\_normalization\_42[0][0]

859 -----

860 activation\_47 (Activation) (None, None, None, 1 0  
batch\_normalization\_47[0][0]

861 -----

862 average\_pooling2d\_4 (AveragePoo (None, None, None, 7 0

File - model\_summary

862               mixed4[0][0]  
863 -----  
864 conv2d\_40 (Conv2D)                            (None, None, None, 1  
147456            mixed4[0][0]  
865 -----  
866 conv2d\_43 (Conv2D)                            (None, None, None, 1  
215040           activation\_42[0][0]  
867 -----  
868 conv2d\_48 (Conv2D)                            (None, None, None, 1  
215040           activation\_47[0][0]  
869 -----  
870 conv2d\_49 (Conv2D)                            (None, None, None, 1  
147456           average\_pooling2d\_4[0][0]  
871 -----  
872 batch\_normalization\_40 (BatchNo (None, None, None, 1 576  
conv2d\_40[0][0]  
873 -----  
874 batch\_normalization\_43 (BatchNo (None, None, None, 1 576  
conv2d\_43[0][0]  
875 -----  
876 batch\_normalization\_48 (BatchNo (None, None, None, 1 576  
conv2d\_48[0][0]  
877 -----  
878 batch\_normalization\_49 (BatchNo (None, None, None, 1 576  
conv2d\_49[0][0]  
879 -----  
880 activation\_40 (Activation)                    (None, None, None, 1 0  
batch\_normalization\_40[0][0]  
881 -----  
882 activation\_43 (Activation)                    (None, None, None, 1 0  
batch\_normalization\_43[0][0]  
883 -----  
884 activation\_48 (Activation)                    (None, None, None, 1 0  
batch\_normalization\_48[0][0]  
885 -----  
886 activation\_49 (Activation)                    (None, None, None, 1 0  
batch\_normalization\_49[0][0]

File - model\_summary

887 -----

888 mixed5 (Concatenate) (None, None, None, 7 0  
activation\_40[0][0]

889 activation\_43[0][0]

890 activation\_48[0][0]

891 activation\_49[0][0]

892 -----

893 conv2d\_54 (Conv2D) (None, None, None, 1  
122880 mixed5[0][0]

894 -----

895 batch\_normalization\_54 (BatchNo (None, None, None, 1 480  
conv2d\_54[0][0]

896 -----

897 activation\_54 (Activation) (None, None, None, 1 0  
batch\_normalization\_54[0][0]

898 -----

899 conv2d\_55 (Conv2D) (None, None, None, 1  
179200 activation\_54[0][0]

900 -----

901 batch\_normalization\_55 (BatchNo (None, None, None, 1 480  
conv2d\_55[0][0]

902 -----

903 activation\_55 (Activation) (None, None, None, 1 0  
batch\_normalization\_55[0][0]

904 -----

905 conv2d\_51 (Conv2D) (None, None, None, 1  
122880 mixed5[0][0]

906 -----

907 conv2d\_56 (Conv2D) (None, None, None, 1  
179200 activation\_55[0][0]

908 -----

909 batch\_normalization\_51 (BatchNo (None, None, None, 1 480  
conv2d\_51[0][0]

910 -----

911 batch\_normalization\_56 (BatchNo (None, None, None, 1 480

File - model\_summary

911 conv2d\_56[0][0]  
912 -----  
913 activation\_51 (Activation) (None, None, None, 1 0  
batch\_normalization\_51[0][0]  
914 -----  
915 activation\_56 (Activation) (None, None, None, 1 0  
batch\_normalization\_56[0][0]  
916 -----  
917 conv2d\_52 (Conv2D) (None, None, None, 1  
179200 activation\_51[0][0]  
918 -----  
919 conv2d\_57 (Conv2D) (None, None, None, 1  
179200 activation\_56[0][0]  
920 -----  
921 batch\_normalization\_52 (BatchNo (None, None, None, 1 480  
conv2d\_52[0][0]  
922 -----  
923 batch\_normalization\_57 (BatchNo (None, None, None, 1 480  
conv2d\_57[0][0]  
924 -----  
925 activation\_52 (Activation) (None, None, None, 1 0  
batch\_normalization\_52[0][0]  
926 -----  
927 activation\_57 (Activation) (None, None, None, 1 0  
batch\_normalization\_57[0][0]  
928 -----  
929 average\_pooling2d\_5 (AveragePoo (None, None, None, 7 0  
mixed5[0][0]  
930 -----  
931 conv2d\_50 (Conv2D) (None, None, None, 1  
147456 mixed5[0][0]  
932 -----  
933 conv2d\_53 (Conv2D) (None, None, None, 1  
215040 activation\_52[0][0]  
934 -----  
935 conv2d\_58 (Conv2D) (None, None, None, 1  
215040 activation\_57[0][0]

File - model\_summary

936 -----

937 conv2d\_59 (Conv2D) (None, None, None, 1  
147456 average\_pooling2d\_5[0][0]

938 -----

939 batch\_normalization\_50 (BatchNo (None, None, None, 1 576  
conv2d\_50[0][0]

940 -----

941 batch\_normalization\_53 (BatchNo (None, None, None, 1 576  
conv2d\_53[0][0]

942 -----

943 batch\_normalization\_58 (BatchNo (None, None, None, 1 576  
conv2d\_58[0][0]

944 -----

945 batch\_normalization\_59 (BatchNo (None, None, None, 1 576  
conv2d\_59[0][0]

946 -----

947 activation\_50 (Activation) (None, None, None, 1 0  
batch\_normalization\_50[0][0]

948 -----

949 activation\_53 (Activation) (None, None, None, 1 0  
batch\_normalization\_53[0][0]

950 -----

951 activation\_58 (Activation) (None, None, None, 1 0  
batch\_normalization\_58[0][0]

952 -----

953 activation\_59 (Activation) (None, None, None, 1 0  
batch\_normalization\_59[0][0]

954 -----

955 mixed6 (Concatenate) (None, None, None, 7 0  
activation\_50[0][0]

956 activation\_53[0][0]

957 activation\_58[0][0]

958 activation\_59[0][0]

959 -----

960 conv2d\_64 (Conv2D) (None, None, None, 1

File - model\_summary

960 147456 mixed6[0][0]  
961 -----  
962 batch\_normalization\_64 (BatchNo (None, None, None, 1 576  
conv2d\_64[0][0])  
963 -----  
964 activation\_64 (Activation) (None, None, None, 1 0  
batch\_normalization\_64[0][0])  
965 -----  
966 conv2d\_65 (Conv2D) (None, None, None, 1  
258048 activation\_64[0][0])  
967 -----  
968 batch\_normalization\_65 (BatchNo (None, None, None, 1 576  
conv2d\_65[0][0])  
969 -----  
970 activation\_65 (Activation) (None, None, None, 1 0  
batch\_normalization\_65[0][0])  
971 -----  
972 conv2d\_61 (Conv2D) (None, None, None, 1  
147456 mixed6[0][0])  
973 -----  
974 conv2d\_66 (Conv2D) (None, None, None, 1  
258048 activation\_65[0][0])  
975 -----  
976 batch\_normalization\_61 (BatchNo (None, None, None, 1 576  
conv2d\_61[0][0])  
977 -----  
978 batch\_normalization\_66 (BatchNo (None, None, None, 1 576  
conv2d\_66[0][0])  
979 -----  
980 activation\_61 (Activation) (None, None, None, 1 0  
batch\_normalization\_61[0][0])  
981 -----  
982 activation\_66 (Activation) (None, None, None, 1 0  
batch\_normalization\_66[0][0])  
983 -----  
984 conv2d\_62 (Conv2D) (None, None, None, 1  
258048 activation\_61[0][0])

File - model\_summary

985 -----

986 conv2d\_67 (Conv2D) (None, None, None, 1  
258048 activation\_66[0][0]

987 -----

988 batch\_normalization\_62 (BatchNo (None, None, None, 1 576  
conv2d\_62[0][0]

989 -----

990 batch\_normalization\_67 (BatchNo (None, None, None, 1 576  
conv2d\_67[0][0]

991 -----

992 activation\_62 (Activation) (None, None, None, 1 0  
batch\_normalization\_62[0][0]

993 -----

994 activation\_67 (Activation) (None, None, None, 1 0  
batch\_normalization\_67[0][0]

995 -----

996 average\_pooling2d\_6 (AveragePoo (None, None, None, 7 0  
mixed6[0][0]

997 -----

998 conv2d\_60 (Conv2D) (None, None, None, 1  
147456 mixed6[0][0]

999 -----

1000 conv2d\_63 (Conv2D) (None, None, None, 1  
258048 activation\_62[0][0]

1001 -----

1002 conv2d\_68 (Conv2D) (None, None, None, 1  
258048 activation\_67[0][0]

1003 -----

1004 conv2d\_69 (Conv2D) (None, None, None, 1  
147456 average\_pooling2d\_6[0][0]

1005 -----

1006 batch\_normalization\_60 (BatchNo (None, None, None, 1 576  
conv2d\_60[0][0]

1007 -----

1008 batch\_normalization\_63 (BatchNo (None, None, None, 1 576  
conv2d\_63[0][0]

1009 -----

File - model\_summary

1009 -----  
1010 batch\_normalization\_68 (BatchNo (None, None, None, 1 576  
conv2d\_68[0][0])  
1011 -----  
1012 batch\_normalization\_69 (BatchNo (None, None, None, 1 576  
conv2d\_69[0][0])  
1013 -----  
1014 activation\_60 (Activation) (None, None, None, 1 0  
batch\_normalization\_60[0][0])  
1015 -----  
1016 activation\_63 (Activation) (None, None, None, 1 0  
batch\_normalization\_63[0][0])  
1017 -----  
1018 activation\_68 (Activation) (None, None, None, 1 0  
batch\_normalization\_68[0][0])  
1019 -----  
1020 activation\_69 (Activation) (None, None, None, 1 0  
batch\_normalization\_69[0][0])  
1021 -----  
1022 mixed7 (Concatenate) (None, None, None, 7 0  
activation\_60[0][0])  
1023 activation\_63[0][0]  
1024 activation\_68[0][0]  
1025 activation\_69[0][0]  
1026 -----  
1027 conv2d\_72 (Conv2D) (None, None, None, 1  
147456 mixed7[0][0])  
1028 -----  
1029 batch\_normalization\_72 (BatchNo (None, None, None, 1 576  
conv2d\_72[0][0])  
1030 -----  
1031 activation\_72 (Activation) (None, None, None, 1 0  
batch\_normalization\_72[0][0])  
1032 -----  
1033 conv2d\_73 (Conv2D) (None, None, None, 1  
258048 activation\_72[0][0])

File - model\_summary

1034 -----

1035 batch\_normalization\_73 (BatchNo (None, None, None, 1 576  
conv2d\_73[0][0]

1036 -----

1037 activation\_73 (Activation) (None, None, None, 1 0  
batch\_normalization\_73[0][0]

1038 -----

1039 conv2d\_70 (Conv2D) (None, None, None, 1  
147456 mixed7[0][0]

1040 -----

1041 conv2d\_74 (Conv2D) (None, None, None, 1  
258048 activation\_73[0][0]

1042 -----

1043 batch\_normalization\_70 (BatchNo (None, None, None, 1 576  
conv2d\_70[0][0]

1044 -----

1045 batch\_normalization\_74 (BatchNo (None, None, None, 1 576  
conv2d\_74[0][0]

1046 -----

1047 activation\_70 (Activation) (None, None, None, 1 0  
batch\_normalization\_70[0][0]

1048 -----

1049 activation\_74 (Activation) (None, None, None, 1 0  
batch\_normalization\_74[0][0]

1050 -----

1051 conv2d\_71 (Conv2D) (None, None, None, 3  
552960 activation\_70[0][0]

1052 -----

1053 conv2d\_75 (Conv2D) (None, None, None, 1  
331776 activation\_74[0][0]

1054 -----

1055 batch\_normalization\_71 (BatchNo (None, None, None, 3 960  
conv2d\_71[0][0]

1056 -----

1057 batch\_normalization\_75 (BatchNo (None, None, None, 1 576  
conv2d\_75[0][0]

1058 -----

File - model\_summary

1058 -----  
1059 activation\_71 (Activation) (None, None, None, 3 0  
batch\_normalization\_71[0][0]  
1060 -----  
1061 activation\_75 (Activation) (None, None, None, 1 0  
batch\_normalization\_75[0][0]  
1062 -----  
1063 max\_pooling2d\_3 (MaxPooling2D) (None, None, None, 7 0  
mixed7[0][0]  
1064 -----  
1065 mixed8 (Concatenate) (None, None, None, 1 0  
activation\_71[0][0]  
1066 activation\_75[0][0]  
1067 max\_pooling2d\_3[0][0]  
1068 -----  
1069 conv2d\_80 (Conv2D) (None, None, None, 4  
573440 mixed8[0][0]  
1070 -----  
1071 batch\_normalization\_80 (BatchNo (None, None, None, 4  
1344 conv2d\_80[0][0]  
1072 -----  
1073 activation\_80 (Activation) (None, None, None, 4 0  
batch\_normalization\_80[0][0]  
1074 -----  
1075 conv2d\_77 (Conv2D) (None, None, None, 3  
491520 mixed8[0][0]  
1076 -----  
1077 conv2d\_81 (Conv2D) (None, None, None, 3  
1548288 activation\_80[0][0]  
1078 -----  
1079 batch\_normalization\_77 (BatchNo (None, None, None, 3  
1152 conv2d\_77[0][0]  
1080 -----  
1081 batch\_normalization\_81 (BatchNo (None, None, None, 3  
1152 conv2d\_81[0][0]  
1082 -----  
-----

File - model\_summary

```
1083 activation_77 (Activation)      (None, None, None, 3 0
    batch_normalization_77[0][0]
1084 -----
1085 activation_81 (Activation)      (None, None, None, 3 0
    batch_normalization_81[0][0]
1086 -----
1087 conv2d_78 (Conv2D)              (None, None, None, 3
    442368      activation_77[0][0]
1088 -----
1089 conv2d_79 (Conv2D)              (None, None, None, 3
    442368      activation_77[0][0]
1090 -----
1091 conv2d_82 (Conv2D)              (None, None, None, 3
    442368      activation_81[0][0]
1092 -----
1093 conv2d_83 (Conv2D)              (None, None, None, 3
    442368      activation_81[0][0]
1094 -----
1095 average_pooling2d_7 (AveragePoo (None, None, None, 1 0
    mixed8[0][0]
1096 -----
1097 conv2d_76 (Conv2D)              (None, None, None, 3
    409600      mixed8[0][0]
1098 -----
1099 batch_normalization_78 (BatchNo (None, None, None, 3
    1152        conv2d_78[0][0]
1100 -----
1101 batch_normalization_79 (BatchNo (None, None, None, 3
    1152        conv2d_79[0][0]
1102 -----
1103 batch_normalization_82 (BatchNo (None, None, None, 3
    1152        conv2d_82[0][0]
1104 -----
1105 batch_normalization_83 (BatchNo (None, None, None, 3
    1152        conv2d_83[0][0]
1106 -----
1107 conv2d_84 (Conv2D)              (None, None, None, 1
```

File - model\_summary

1107 245760 average\_pooling2d\_7[0][0]  
1108 -----  
  
1109 batch\_normalization\_76 (BatchNo (None, None, None, 3 960  
conv2d\_76[0][0])  
1110 -----  
  
1111 activation\_78 (Activation) (None, None, None, 3 0  
batch\_normalization\_78[0][0])  
1112 -----  
  
1113 activation\_79 (Activation) (None, None, None, 3 0  
batch\_normalization\_79[0][0])  
1114 -----  
  
1115 activation\_82 (Activation) (None, None, None, 3 0  
batch\_normalization\_82[0][0])  
1116 -----  
  
1117 activation\_83 (Activation) (None, None, None, 3 0  
batch\_normalization\_83[0][0])  
1118 -----  
  
1119 batch\_normalization\_84 (BatchNo (None, None, None, 1 576  
conv2d\_84[0][0])  
1120 -----  
  
1121 activation\_76 (Activation) (None, None, None, 3 0  
batch\_normalization\_76[0][0])  
1122 -----  
  
1123 mixed9\_0 (Concatenate) (None, None, None, 7 0  
activation\_78[0][0])  
1124 activation\_79[0][0]  
1125 -----  
  
1126 concatenate (Concatenate) (None, None, None, 7 0  
activation\_82[0][0])  
1127 activation\_83[0][0]  
1128 -----  
  
1129 activation\_84 (Activation) (None, None, None, 1 0  
batch\_normalization\_84[0][0])  
1130 -----  
  
1131 mixed9 (Concatenate) (None, None, None, 2 0  
activation\_76[0][0])

File - model\_summary

```
1132      mixed9_0[0][0]
1133      concatenate[0][0]
1134      activation_84[0][0]
1135 -----
1136 conv2d_89 (Conv2D)           (None, None, None, 4
917504      mixed9[0][0]
1137 -----
1138 batch_normalization_89 (BatchNo (None, None, None, 4
1344      conv2d_89[0][0]
1139 -----
1140 activation_89 (Activation) (None, None, None, 4 0
batch_normalization_89[0][0]
1141 -----
1142 conv2d_86 (Conv2D)           (None, None, None, 3
786432      mixed9[0][0]
1143 -----
1144 conv2d_90 (Conv2D)           (None, None, None, 3
1548288      activation_89[0][0]
1145 -----
1146 batch_normalization_86 (BatchNo (None, None, None, 3
1152      conv2d_86[0][0]
1147 -----
1148 batch_normalization_90 (BatchNo (None, None, None, 3
1152      conv2d_90[0][0]
1149 -----
1150 activation_86 (Activation) (None, None, None, 3 0
batch_normalization_86[0][0]
1151 -----
1152 activation_90 (Activation) (None, None, None, 3 0
batch_normalization_90[0][0]
1153 -----
1154 conv2d_87 (Conv2D)           (None, None, None, 3
442368      activation_86[0][0]
1155 -----
1156 conv2d_88 (Conv2D)           (None, None, None, 3
```

File - model\_summary

1156 442368 activation\_86[0][0]  
1157 -----  
  
1158 conv2d\_91 (Conv2D) (None, None, None, 3  
442368 activation\_90[0][0]  
1159 -----  
  
1160 conv2d\_92 (Conv2D) (None, None, None, 3  
442368 activation\_90[0][0]  
1161 -----  
  
1162 average\_pooling2d\_8 (AveragePoo (None, None, None, 2 0  
mixed9[0][0]  
1163 -----  
  
1164 conv2d\_85 (Conv2D) (None, None, None, 3  
655360 mixed9[0][0]  
1165 -----  
  
1166 batch\_normalization\_87 (BatchNo (None, None, None, 3  
1152 conv2d\_87[0][0]  
1167 -----  
  
1168 batch\_normalization\_88 (BatchNo (None, None, None, 3  
1152 conv2d\_88[0][0]  
1169 -----  
  
1170 batch\_normalization\_91 (BatchNo (None, None, None, 3  
1152 conv2d\_91[0][0]  
1171 -----  
  
1172 batch\_normalization\_92 (BatchNo (None, None, None, 3  
1152 conv2d\_92[0][0]  
1173 -----  
  
1174 conv2d\_93 (Conv2D) (None, None, None, 1  
393216 average\_pooling2d\_8[0][0]  
1175 -----  
  
1176 batch\_normalization\_85 (BatchNo (None, None, None, 3 960  
conv2d\_85[0][0]  
1177 -----  
  
1178 activation\_87 (Activation) (None, None, None, 3 0  
batch\_normalization\_87[0][0]  
1179 -----  
  
1180 activation\_88 (Activation) (None, None, None, 3 0  
batch\_normalization\_88[0][0]

File - model\_summary

1181 -----

1182 activation\_91 (Activation) (None, None, None, 3 0  
batch\_normalization\_91[0][0]

1183 -----

1184 activation\_92 (Activation) (None, None, None, 3 0  
batch\_normalization\_92[0][0]

1185 -----

1186 batch\_normalization\_93 (BatchNo (None, None, None, 1 576  
conv2d\_93[0][0]

1187 -----

1188 activation\_85 (Activation) (None, None, None, 3 0  
batch\_normalization\_85[0][0]

1189 -----

1190 mixed9\_1 (Concatenate) (None, None, None, 7 0  
activation\_87[0][0]

1191 activation\_88[0][0]

1192 -----

1193 concatenate\_1 (Concatenate) (None, None, None, 7 0  
activation\_91[0][0]

1194 activation\_92[0][0]

1195 -----

1196 activation\_93 (Activation) (None, None, None, 1 0  
batch\_normalization\_93[0][0]

1197 -----

1198 mixed10 (Concatenate) (None, None, None, 2 0  
activation\_85[0][0]

1199 mixed9\_1[0][0]

1200 concatenate\_1[0][0]

1201 activation\_93[0][0]

1202 -----

1203 avg\_pool (GlobalAveragePooling2 (None, 2048) 0  
mixed10[0][0]

1204 -----

1205 predictions (Dense) (None, 1000)

```
File - model_summary
1205 2049000      avg_pool[0][0]
1206 =====
1207 Total params: 23,851,784
1208 Trainable params: 23,817,352
1209 Non-trainable params: 34,432
1210 -----
1211 None
1212 =====
1213
1214 Process finished with exit code 0
1215
```