

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In [1]: `# %reset`

Imports

In [22]: `!pip install ipython-autotime`

```
Requirement already satisfied: ipython-autotime in /usr/local/lib/python3.6/dist-packages (0.3.0)
Requirement already satisfied: ipython in /usr/local/lib/python3.6/dist-packages (from ipython-autotime) (5.5.0)
Requirement already satisfied: pexpect; sys_platform != "win32" in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (4.8.0)
Requirement already satisfied: simplegeneric>0.8 in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (0.8.1)
Requirement already satisfied: prompt-toolkit<2.0.0,>=1.0.4 in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (1.0.18)
Requirement already satisfied: pickleshare in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (0.7.5)
Requirement already satisfied: traitlets>=4.2 in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (4.3.3)
Requirement already satisfied: pygments in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (2.6.1)
Requirement already satisfied: decorator in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (4.4.2)
Requirement already satisfied: setuptools>=18.5 in /usr/local/lib/python3.6/dist-packages (from ipython->ipython-autotime) (51.0.0)
Requirement already satisfied: ptyprocess>=0.5 in /usr/local/lib/python3.6/dist-packages (from pexpect; sys_platform != "win32"->ipython->ipython-autotime) (0.6.0)
Requirement already satisfied: wcwidth in /usr/local/lib/python3.6/dist-packages (from prompt-toolkit<2.0.0,>=1.0.4->ipython->ipython-autotime) (0.2.5)
Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.6/dist-packages (from prompt-toolkit<2.0.0,>=1.0.4->ipython->ipython-autotime) (1.15.0)
Requirement already satisfied: ipython-genutils in /usr/local/lib/python3.6/dist-packages (from traitlets>=4.2->ipython->ipython-autotime) (0.2.0)
time: 2.28 s (started: 2021-01-05 22:29:01 +00:00)
```

In [23]: `# necessary imports`
`import os`
`import cv2`
`import numpy as np`
`from imutils import paths`
`from sklearn.preprocessing import LabelBinarizer`
`from tqdm import tqdm`

`import matplotlib.pyplot as plt`
`%matplotlib inline`

`from google.colab.patches import cv2_imshow`

`%load_ext autotime`

```
The autotime extension is already loaded. To reload it, use:
  %reload_ext autotime
time: 4.5 ms (started: 2021-01-05 22:29:03 +00:00)
```

Initializing

```
In [24]: img_width = 90
img_height = 90
```

time: 1.15 ms (started: 2021-01-05 22:29:03 +00:00)

NASNetLarge Model

```
In [25]: from keras.applications import InceptionResNetV2
from keras.models import Model
from keras.layers import Dense
from keras.layers import Flatten
```

time: 1.01 ms (started: 2021-01-05 22:29:04 +00:00)

```
In [26]: # from keras.applications import NASNetLarge
# # Load NASNetLarge model without classification layers
# model = NASNetLarge(include_top=False, weights='imagenet', input_shape=(331, 331, 3))
```

time: 644 µs (started: 2021-01-05 22:29:05 +00:00)

```
In [27]: # # Load NASNetMobile model without classification layers
# model = keras.applications.nasnet.NASNetMobile(include_top=False, weights='imagenet',
```

time: 597 µs (started: 2021-01-05 22:29:06 +00:00)

```
In [28]: model = InceptionResNetV2(include_top=False, weights='imagenet', input_shape=(img_width
```

time: 9.85 s (started: 2021-01-05 22:29:06 +00:00)

```
In [29]: # add new classification layers
flat1 = Flatten()(model.layers[-1].output) # flatten last layer
class1 = Dense(1024, activation='relu')(flat1) # add FC layer on previous layer
output = Dense(6, activation='softmax')(class1) # add softmax layer
```

time: 20.9 ms (started: 2021-01-05 22:29:16 +00:00)

```
In [30]: # define the new model
model = Model(inputs=model.inputs, outputs=output)
model.summary()
```

Model: "model_1"

Layer (type)	Output Shape	Param #	Connected to
=====			
input_2 (InputLayer)	[(None, 90, 90, 3)]	0	
=====			
conv2d_203 (Conv2D)	(None, 44, 44, 32)	864	input_2[0][0]
=====			
batch_normalization_203 (Batch Normalization)	(None, 44, 44, 32)	96	conv2d_203[0][0]
=====			
activation_203 (Activation)	(None, 44, 44, 32)	0	batch_normalization_203[0][0]
=====			
conv2d_204 (Conv2D)	(None, 42, 42, 32)	9216	activation_203[0][0]

batch_normalization_204 (BatchN	(None, 42, 42, 32)	96	conv2d_204[0][0]
activation_204 (Activation)	(None, 42, 42, 32)	0	batch_normalization_204[0][0]
conv2d_205 (Conv2D)	(None, 42, 42, 64)	18432	activation_204[0][0]
batch_normalization_205 (BatchN	(None, 42, 42, 64)	192	conv2d_205[0][0]
activation_205 (Activation)	(None, 42, 42, 64)	0	batch_normalization_205[0][0]
max_pooling2d_4 (MaxPooling2D)	(None, 20, 20, 64)	0	activation_205[0][0]
conv2d_206 (Conv2D)	(None, 20, 20, 80)	5120	max_pooling2d_4[0][0]
batch_normalization_206 (BatchN	(None, 20, 20, 80)	240	conv2d_206[0][0]
activation_206 (Activation)	(None, 20, 20, 80)	0	batch_normalization_206[0][0]
conv2d_207 (Conv2D)	(None, 18, 18, 192)	138240	activation_206[0][0]
batch_normalization_207 (BatchN	(None, 18, 18, 192)	576	conv2d_207[0][0]
activation_207 (Activation)	(None, 18, 18, 192)	0	batch_normalization_207[0][0]
max_pooling2d_5 (MaxPooling2D)	(None, 8, 8, 192)	0	activation_207[0][0]
conv2d_211 (Conv2D)	(None, 8, 8, 64)	12288	max_pooling2d_5[0][0]
batch_normalization_211 (BatchN	(None, 8, 8, 64)	192	conv2d_211[0][0]
activation_211 (Activation)	(None, 8, 8, 64)	0	batch_normalization_211[0][0]
conv2d_209 (Conv2D)	(None, 8, 8, 48)	9216	max_pooling2d_5[0][0]
conv2d_212 (Conv2D)	(None, 8, 8, 96)	55296	activation_211[0][0]
batch_normalization_209 (BatchN	(None, 8, 8, 48)	144	conv2d_209[0][0]
batch_normalization_212 (BatchN	(None, 8, 8, 96)	288	conv2d_212[0][0]

activation_209 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_209
activation_212 (Activation) [0][0]	(None, 8, 8, 96)	0	batch_normalization_212
average_pooling2d_1 (AveragePool)	(None, 8, 8, 192)	0	max_pooling2d_5[0][0]
conv2d_208 (Conv2D)	(None, 8, 8, 96)	18432	max_pooling2d_5[0][0]
conv2d_210 (Conv2D)	(None, 8, 8, 64)	76800	activation_209[0][0]
conv2d_213 (Conv2D)	(None, 8, 8, 96)	82944	activation_212[0][0]
conv2d_214 (Conv2D) [0]	(None, 8, 8, 64)	12288	average_pooling2d_1[0]
batch_normalization_208 (Batch Normalization)	(None, 8, 8, 96)	288	conv2d_208[0][0]
batch_normalization_210 (Batch Normalization)	(None, 8, 8, 64)	192	conv2d_210[0][0]
batch_normalization_213 (Batch Normalization)	(None, 8, 8, 96)	288	conv2d_213[0][0]
batch_normalization_214 (Batch Normalization)	(None, 8, 8, 64)	192	conv2d_214[0][0]
activation_208 (Activation) [0][0]	(None, 8, 8, 96)	0	batch_normalization_208
activation_210 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_210
activation_213 (Activation) [0][0]	(None, 8, 8, 96)	0	batch_normalization_213
activation_214 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_214
mixed_5b (Concatenate)	(None, 8, 8, 320)	0	activation_208[0][0] activation_210[0][0] activation_213[0][0] activation_214[0][0]
conv2d_218 (Conv2D)	(None, 8, 8, 32)	10240	mixed_5b[0][0]
batch_normalization_218 (Batch Normalization)	(None, 8, 8, 32)	96	conv2d_218[0][0]

activation_218 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_218
conv2d_216 (Conv2D)	(None, 8, 8, 32)	10240	mixed_5b[0][0]
conv2d_219 (Conv2D)	(None, 8, 8, 48)	13824	activation_218[0][0]
batch_normalization_216 (BatchN	(None, 8, 8, 32)	96	conv2d_216[0][0]
batch_normalization_219 (BatchN	(None, 8, 8, 48)	144	conv2d_219[0][0]
activation_216 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_216
activation_219 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_219
conv2d_215 (Conv2D)	(None, 8, 8, 32)	10240	mixed_5b[0][0]
conv2d_217 (Conv2D)	(None, 8, 8, 32)	9216	activation_216[0][0]
conv2d_220 (Conv2D)	(None, 8, 8, 64)	27648	activation_219[0][0]
batch_normalization_215 (BatchN	(None, 8, 8, 32)	96	conv2d_215[0][0]
batch_normalization_217 (BatchN	(None, 8, 8, 32)	96	conv2d_217[0][0]
batch_normalization_220 (BatchN	(None, 8, 8, 64)	192	conv2d_220[0][0]
activation_215 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_215
activation_217 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_217
activation_220 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_220
block35_1_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_215[0][0] activation_217[0][0] activation_220[0][0]
block35_1_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_1_mixed[0][0]
block35_1 (Lambda)	(None, 8, 8, 320)	0	mixed_5b[0][0] block35_1_conv[0][0]

block35_1_ac (Activation)	(None, 8, 8, 320)	0	block35_1[0][0]
conv2d_224 (Conv2D)	(None, 8, 8, 32)	10240	block35_1_ac[0][0]
batch_normalization_224 (BatchN	(None, 8, 8, 32)	96	conv2d_224[0][0]
activation_224 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_224
conv2d_222 (Conv2D)	(None, 8, 8, 32)	10240	block35_1_ac[0][0]
conv2d_225 (Conv2D)	(None, 8, 8, 48)	13824	activation_224[0][0]
batch_normalization_222 (BatchN	(None, 8, 8, 32)	96	conv2d_222[0][0]
batch_normalization_225 (BatchN	(None, 8, 8, 48)	144	conv2d_225[0][0]
activation_222 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_222
activation_225 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_225
conv2d_221 (Conv2D)	(None, 8, 8, 32)	10240	block35_1_ac[0][0]
conv2d_223 (Conv2D)	(None, 8, 8, 32)	9216	activation_222[0][0]
conv2d_226 (Conv2D)	(None, 8, 8, 64)	27648	activation_225[0][0]
batch_normalization_221 (BatchN	(None, 8, 8, 32)	96	conv2d_221[0][0]
batch_normalization_223 (BatchN	(None, 8, 8, 32)	96	conv2d_223[0][0]
batch_normalization_226 (BatchN	(None, 8, 8, 64)	192	conv2d_226[0][0]
activation_221 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_221
activation_223 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_223
activation_226 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_226

block35_2_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_221[0][0] activation_223[0][0] activation_226[0][0]
block35_2_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_2_mixed[0][0]
block35_2 (Lambda)	(None, 8, 8, 320)	0	block35_1_ac[0][0] block35_2_conv[0][0]
block35_2_ac (Activation)	(None, 8, 8, 320)	0	block35_2[0][0]
conv2d_230 (Conv2D)	(None, 8, 8, 32)	10240	block35_2_ac[0][0]
batch_normalization_230 (BatchN	(None, 8, 8, 32)	96	conv2d_230[0][0]
activation_230 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_230
conv2d_228 (Conv2D)	(None, 8, 8, 32)	10240	block35_2_ac[0][0]
conv2d_231 (Conv2D)	(None, 8, 8, 48)	13824	activation_230[0][0]
batch_normalization_228 (BatchN	(None, 8, 8, 32)	96	conv2d_228[0][0]
batch_normalization_231 (BatchN	(None, 8, 8, 48)	144	conv2d_231[0][0]
activation_228 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_228
activation_231 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_231
conv2d_227 (Conv2D)	(None, 8, 8, 32)	10240	block35_2_ac[0][0]
conv2d_229 (Conv2D)	(None, 8, 8, 32)	9216	activation_228[0][0]
conv2d_232 (Conv2D)	(None, 8, 8, 64)	27648	activation_231[0][0]
batch_normalization_227 (BatchN	(None, 8, 8, 32)	96	conv2d_227[0][0]
batch_normalization_229 (BatchN	(None, 8, 8, 32)	96	conv2d_229[0][0]
batch_normalization_232 (BatchN	(None, 8, 8, 64)	192	conv2d_232[0][0]
activation_227 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_227

activation_229 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_229
activation_232 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_232
block35_3_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_227[0][0] activation_229[0][0] activation_232[0][0]
block35_3_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_3_mixed[0][0]
block35_3 (Lambda)	(None, 8, 8, 320)	0	block35_2_ac[0][0] block35_3_conv[0][0]
block35_3_ac (Activation)	(None, 8, 8, 320)	0	block35_3[0][0]
conv2d_236 (Conv2D)	(None, 8, 8, 32)	10240	block35_3_ac[0][0]
batch_normalization_236 (BatchN	(None, 8, 8, 32)	96	conv2d_236[0][0]
activation_236 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_236
conv2d_234 (Conv2D)	(None, 8, 8, 32)	10240	block35_3_ac[0][0]
conv2d_237 (Conv2D)	(None, 8, 8, 48)	13824	activation_236[0][0]
batch_normalization_234 (BatchN	(None, 8, 8, 32)	96	conv2d_234[0][0]
batch_normalization_237 (BatchN	(None, 8, 8, 48)	144	conv2d_237[0][0]
activation_234 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_234
activation_237 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_237
conv2d_233 (Conv2D)	(None, 8, 8, 32)	10240	block35_3_ac[0][0]
conv2d_235 (Conv2D)	(None, 8, 8, 32)	9216	activation_234[0][0]
conv2d_238 (Conv2D)	(None, 8, 8, 64)	27648	activation_237[0][0]
batch_normalization_233 (BatchN	(None, 8, 8, 32)	96	conv2d_233[0][0]

batch_normalization_235	(BatchN (None, 8, 8, 32))	96	conv2d_235[0][0]
batch_normalization_238	(BatchN (None, 8, 8, 64))	192	conv2d_238[0][0]
activation_233 [0][0]	(None, 8, 8, 32)	0	batch_normalization_233
activation_235 [0][0]	(None, 8, 8, 32)	0	batch_normalization_235
activation_238 [0][0]	(None, 8, 8, 64)	0	batch_normalization_238
block35_4_mixed	(Concatenate (None, 8, 8, 128))	0	activation_233[0][0] activation_235[0][0] activation_238[0][0]
block35_4_conv	(Conv2D (None, 8, 8, 320))	41280	block35_4_mixed[0][0]
block35_4	(Lambda (None, 8, 8, 320))	0	block35_3_ac[0][0] block35_4_conv[0][0]
block35_4_ac	(Activation (None, 8, 8, 320))	0	block35_4[0][0]
conv2d_242	(Conv2D (None, 8, 8, 32))	10240	block35_4_ac[0][0]
batch_normalization_242	(BatchN (None, 8, 8, 32))	96	conv2d_242[0][0]
activation_242 [0][0]	(None, 8, 8, 32)	0	batch_normalization_242
conv2d_240	(Conv2D (None, 8, 8, 32))	10240	block35_4_ac[0][0]
conv2d_243	(Conv2D (None, 8, 8, 48))	13824	activation_242[0][0]
batch_normalization_240	(BatchN (None, 8, 8, 32))	96	conv2d_240[0][0]
batch_normalization_243	(BatchN (None, 8, 8, 48))	144	conv2d_243[0][0]
activation_240 [0][0]	(None, 8, 8, 32)	0	batch_normalization_240
activation_243 [0][0]	(None, 8, 8, 48)	0	batch_normalization_243

conv2d_239 (Conv2D)	(None, 8, 8, 32)	10240	block35_4_ac[0][0]
conv2d_241 (Conv2D)	(None, 8, 8, 32)	9216	activation_240[0][0]
conv2d_244 (Conv2D)	(None, 8, 8, 64)	27648	activation_243[0][0]
batch_normalization_239 (BatchN	(None, 8, 8, 32)	96	conv2d_239[0][0]
batch_normalization_241 (BatchN	(None, 8, 8, 32)	96	conv2d_241[0][0]
batch_normalization_244 (BatchN	(None, 8, 8, 64)	192	conv2d_244[0][0]
activation_239 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_239
activation_241 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_241
activation_244 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_244
block35_5_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_239[0][0] activation_241[0][0] activation_244[0][0]
block35_5_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_5_mixed[0][0]
block35_5 (Lambda)	(None, 8, 8, 320)	0	block35_4_ac[0][0] block35_5_conv[0][0]
block35_5_ac (Activation)	(None, 8, 8, 320)	0	block35_5[0][0]
conv2d_248 (Conv2D)	(None, 8, 8, 32)	10240	block35_5_ac[0][0]
batch_normalization_248 (BatchN	(None, 8, 8, 32)	96	conv2d_248[0][0]
activation_248 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_248
conv2d_246 (Conv2D)	(None, 8, 8, 32)	10240	block35_5_ac[0][0]
conv2d_249 (Conv2D)	(None, 8, 8, 48)	13824	activation_248[0][0]
batch_normalization_246 (BatchN	(None, 8, 8, 32)	96	conv2d_246[0][0]
batch_normalization_249 (BatchN	(None, 8, 8, 48)	144	conv2d_249[0][0]

activation_246 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_246
activation_249 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_249
conv2d_245 (Conv2D)	(None, 8, 8, 32)	10240	block35_5_ac[0][0]
conv2d_247 (Conv2D)	(None, 8, 8, 32)	9216	activation_246[0][0]
conv2d_250 (Conv2D)	(None, 8, 8, 64)	27648	activation_249[0][0]
batch_normalization_245 (BatchN	(None, 8, 8, 32)	96	conv2d_245[0][0]
batch_normalization_247 (BatchN	(None, 8, 8, 32)	96	conv2d_247[0][0]
batch_normalization_250 (BatchN	(None, 8, 8, 64)	192	conv2d_250[0][0]
activation_245 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_245
activation_247 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_247
activation_250 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_250
block35_6_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_245[0][0] activation_247[0][0] activation_250[0][0]
block35_6_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_6_mixed[0][0]
block35_6 (Lambda)	(None, 8, 8, 320)	0	block35_5_ac[0][0] block35_6_conv[0][0]
block35_6_ac (Activation)	(None, 8, 8, 320)	0	block35_6[0][0]
conv2d_254 (Conv2D)	(None, 8, 8, 32)	10240	block35_6_ac[0][0]
batch_normalization_254 (BatchN	(None, 8, 8, 32)	96	conv2d_254[0][0]
activation_254 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_254

conv2d_252 (Conv2D)	(None, 8, 8, 32)	10240	block35_6_ac[0][0]
conv2d_255 (Conv2D)	(None, 8, 8, 48)	13824	activation_254[0][0]
batch_normalization_252 (BatchN	(None, 8, 8, 32)	96	conv2d_252[0][0]
batch_normalization_255 (BatchN	(None, 8, 8, 48)	144	conv2d_255[0][0]
activation_252 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_252
activation_255 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_255
conv2d_251 (Conv2D)	(None, 8, 8, 32)	10240	block35_6_ac[0][0]
conv2d_253 (Conv2D)	(None, 8, 8, 32)	9216	activation_252[0][0]
conv2d_256 (Conv2D)	(None, 8, 8, 64)	27648	activation_255[0][0]
batch_normalization_251 (BatchN	(None, 8, 8, 32)	96	conv2d_251[0][0]
batch_normalization_253 (BatchN	(None, 8, 8, 32)	96	conv2d_253[0][0]
batch_normalization_256 (BatchN	(None, 8, 8, 64)	192	conv2d_256[0][0]
activation_251 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_251
activation_253 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_253
activation_256 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_256
block35_7_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_251[0][0] activation_253[0][0] activation_256[0][0]
block35_7_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_7_mixed[0][0]
block35_7 (Lambda)	(None, 8, 8, 320)	0	block35_6_ac[0][0] block35_7_conv[0][0]
block35_7_ac (Activation)	(None, 8, 8, 320)	0	block35_7[0][0]

conv2d_260 (Conv2D)	(None, 8, 8, 32)	10240	block35_7_ac[0][0]
batch_normalization_260 (Batch Normalization)	(None, 8, 8, 32)	96	conv2d_260[0][0]
activation_260 (Activation)	(None, 8, 8, 32)	0	batch_normalization_260[0][0]
conv2d_258 (Conv2D)	(None, 8, 8, 32)	10240	block35_7_ac[0][0]
conv2d_261 (Conv2D)	(None, 8, 8, 48)	13824	activation_260[0][0]
batch_normalization_258 (Batch Normalization)	(None, 8, 8, 32)	96	conv2d_258[0][0]
batch_normalization_261 (Batch Normalization)	(None, 8, 8, 48)	144	conv2d_261[0][0]
activation_258 (Activation)	(None, 8, 8, 32)	0	batch_normalization_258[0][0]
activation_261 (Activation)	(None, 8, 8, 48)	0	batch_normalization_261[0][0]
conv2d_257 (Conv2D)	(None, 8, 8, 32)	10240	block35_7_ac[0][0]
conv2d_259 (Conv2D)	(None, 8, 8, 32)	9216	activation_258[0][0]
conv2d_262 (Conv2D)	(None, 8, 8, 64)	27648	activation_261[0][0]
batch_normalization_257 (Batch Normalization)	(None, 8, 8, 32)	96	conv2d_257[0][0]
batch_normalization_259 (Batch Normalization)	(None, 8, 8, 32)	96	conv2d_259[0][0]
batch_normalization_262 (Batch Normalization)	(None, 8, 8, 64)	192	conv2d_262[0][0]
activation_257 (Activation)	(None, 8, 8, 32)	0	batch_normalization_257[0][0]
activation_259 (Activation)	(None, 8, 8, 32)	0	batch_normalization_259[0][0]
activation_262 (Activation)	(None, 8, 8, 64)	0	batch_normalization_262[0][0]
block35_8_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_257[0][0] activation_259[0][0] activation_262[0][0]

block35_8_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_8_mixed[0][0]
block35_8 (Lambda)	(None, 8, 8, 320)	0	block35_7_ac[0][0] block35_8_conv[0][0]
block35_8_ac (Activation)	(None, 8, 8, 320)	0	block35_8[0][0]
conv2d_266 (Conv2D)	(None, 8, 8, 32)	10240	block35_8_ac[0][0]
batch_normalization_266 (BatchN	(None, 8, 8, 32)	96	conv2d_266[0][0]
activation_266 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_266
conv2d_264 (Conv2D)	(None, 8, 8, 32)	10240	block35_8_ac[0][0]
conv2d_267 (Conv2D)	(None, 8, 8, 48)	13824	activation_266[0][0]
batch_normalization_264 (BatchN	(None, 8, 8, 32)	96	conv2d_264[0][0]
batch_normalization_267 (BatchN	(None, 8, 8, 48)	144	conv2d_267[0][0]
activation_264 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_264
activation_267 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_267
conv2d_263 (Conv2D)	(None, 8, 8, 32)	10240	block35_8_ac[0][0]
conv2d_265 (Conv2D)	(None, 8, 8, 32)	9216	activation_264[0][0]
conv2d_268 (Conv2D)	(None, 8, 8, 64)	27648	activation_267[0][0]
batch_normalization_263 (BatchN	(None, 8, 8, 32)	96	conv2d_263[0][0]
batch_normalization_265 (BatchN	(None, 8, 8, 32)	96	conv2d_265[0][0]
batch_normalization_268 (BatchN	(None, 8, 8, 64)	192	conv2d_268[0][0]
activation_263 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_263
activation_265 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_265

activation_268 (Activation) [0][0]	(None, 8, 8, 64)	0	batch_normalization_268
block35_9_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_263[0][0] activation_265[0][0] activation_268[0][0]
block35_9_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_9_mixed[0][0]
block35_9 (Lambda)	(None, 8, 8, 320)	0	block35_8_ac[0][0] block35_9_conv[0][0]
block35_9_ac (Activation)	(None, 8, 8, 320)	0	block35_9[0][0]
conv2d_272 (Conv2D)	(None, 8, 8, 32)	10240	block35_9_ac[0][0]
batch_normalization_272 (BatchN	(None, 8, 8, 32)	96	conv2d_272[0][0]
activation_272 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_272
conv2d_270 (Conv2D)	(None, 8, 8, 32)	10240	block35_9_ac[0][0]
conv2d_273 (Conv2D)	(None, 8, 8, 48)	13824	activation_272[0][0]
batch_normalization_270 (BatchN	(None, 8, 8, 32)	96	conv2d_270[0][0]
batch_normalization_273 (BatchN	(None, 8, 8, 48)	144	conv2d_273[0][0]
activation_270 (Activation) [0][0]	(None, 8, 8, 32)	0	batch_normalization_270
activation_273 (Activation) [0][0]	(None, 8, 8, 48)	0	batch_normalization_273
conv2d_269 (Conv2D)	(None, 8, 8, 32)	10240	block35_9_ac[0][0]
conv2d_271 (Conv2D)	(None, 8, 8, 32)	9216	activation_270[0][0]
conv2d_274 (Conv2D)	(None, 8, 8, 64)	27648	activation_273[0][0]
batch_normalization_269 (BatchN	(None, 8, 8, 32)	96	conv2d_269[0][0]
batch_normalization_271 (BatchN	(None, 8, 8, 32)	96	conv2d_271[0][0]

batch_normalization_274 (BatchN	(None, 8, 8, 64)	192	conv2d_274[0][0]
activation_269 (Activation)	(None, 8, 8, 32)	0	batch_normalization_269[0][0]
activation_271 (Activation)	(None, 8, 8, 32)	0	batch_normalization_271[0][0]
activation_274 (Activation)	(None, 8, 8, 64)	0	batch_normalization_274[0][0]
block35_10_mixed (Concatenate)	(None, 8, 8, 128)	0	activation_269[0][0] activation_271[0][0] activation_274[0][0]
block35_10_conv (Conv2D)	(None, 8, 8, 320)	41280	block35_10_mixed[0][0]
block35_10 (Lambda)	(None, 8, 8, 320)	0	block35_9_ac[0][0] block35_10_conv[0][0]
block35_10_ac (Activation)	(None, 8, 8, 320)	0	block35_10[0][0]
conv2d_276 (Conv2D)	(None, 8, 8, 256)	81920	block35_10_ac[0][0]
batch_normalization_276 (BatchN	(None, 8, 8, 256)	768	conv2d_276[0][0]
activation_276 (Activation)	(None, 8, 8, 256)	0	batch_normalization_276[0][0]
conv2d_277 (Conv2D)	(None, 8, 8, 256)	589824	activation_276[0][0]
batch_normalization_277 (BatchN	(None, 8, 8, 256)	768	conv2d_277[0][0]
activation_277 (Activation)	(None, 8, 8, 256)	0	batch_normalization_277[0][0]
conv2d_275 (Conv2D)	(None, 3, 3, 384)	1105920	block35_10_ac[0][0]
conv2d_278 (Conv2D)	(None, 3, 3, 384)	884736	activation_277[0][0]
batch_normalization_275 (BatchN	(None, 3, 3, 384)	1152	conv2d_275[0][0]
batch_normalization_278 (BatchN	(None, 3, 3, 384)	1152	conv2d_278[0][0]
activation_275 (Activation)	(None, 3, 3, 384)	0	batch_normalization_275[0][0]

<u>activation_278</u> (Activation) [0][0]	(None, 3, 3, 384)	0	batch_normalization_278
<u>max_pooling2d_6</u> (MaxPooling2D)	(None, 3, 3, 320)	0	block35_10_ac[0][0]
<u>mixed_6a</u> (Concatenate)	(None, 3, 3, 1088)	0	activation_275[0][0] activation_278[0][0] max_pooling2d_6[0][0]
<u>conv2d_280</u> (Conv2D)	(None, 3, 3, 128)	139264	mixed_6a[0][0]
<u>batch_normalization_280</u> (BatchN	(None, 3, 3, 128)	384	conv2d_280[0][0]
<u>activation_280</u> (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_280
<u>conv2d_281</u> (Conv2D)	(None, 3, 3, 160)	143360	activation_280[0][0]
<u>batch_normalization_281</u> (BatchN	(None, 3, 3, 160)	480	conv2d_281[0][0]
<u>activation_281</u> (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_281
<u>conv2d_279</u> (Conv2D)	(None, 3, 3, 192)	208896	mixed_6a[0][0]
<u>conv2d_282</u> (Conv2D)	(None, 3, 3, 192)	215040	activation_281[0][0]
<u>batch_normalization_279</u> (BatchN	(None, 3, 3, 192)	576	conv2d_279[0][0]
<u>batch_normalization_282</u> (BatchN	(None, 3, 3, 192)	576	conv2d_282[0][0]
<u>activation_279</u> (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_279
<u>activation_282</u> (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_282
<u>block17_1_mixed</u> (Concatenate)	(None, 3, 3, 384)	0	activation_279[0][0] activation_282[0][0]
<u>block17_1_conv</u> (Conv2D)	(None, 3, 3, 1088)	418880	block17_1_mixed[0][0]
<u>block17_1</u> (Lambda)	(None, 3, 3, 1088)	0	mixed_6a[0][0] block17_1_conv[0][0]
<u>block17_1_ac</u> (Activation)	(None, 3, 3, 1088)	0	block17_1[0][0]

conv2d_284 (Conv2D)	(None, 3, 3, 128)	139264	block17_1_ac[0][0]
batch_normalization_284 (Batch Normalization)	(None, 3, 3, 128)	384	conv2d_284[0][0]
activation_284 (Activation)	(None, 3, 3, 128)	0	batch_normalization_284[0][0]
conv2d_285 (Conv2D)	(None, 3, 3, 160)	143360	activation_284[0][0]
batch_normalization_285 (Batch Normalization)	(None, 3, 3, 160)	480	conv2d_285[0][0]
activation_285 (Activation)	(None, 3, 3, 160)	0	batch_normalization_285[0][0]
conv2d_283 (Conv2D)	(None, 3, 3, 192)	208896	block17_1_ac[0][0]
conv2d_286 (Conv2D)	(None, 3, 3, 192)	215040	activation_285[0][0]
batch_normalization_283 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_283[0][0]
batch_normalization_286 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_286[0][0]
activation_283 (Activation)	(None, 3, 3, 192)	0	batch_normalization_283[0][0]
activation_286 (Activation)	(None, 3, 3, 192)	0	batch_normalization_286[0][0]
block17_2_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_283[0][0] activation_286[0][0]
block17_2_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_2_mixed[0][0]
block17_2 (Lambda)	(None, 3, 3, 1088)	0	block17_1_ac[0][0] block17_2_conv[0][0]
block17_2_ac (Activation)	(None, 3, 3, 1088)	0	block17_2[0][0]
conv2d_288 (Conv2D)	(None, 3, 3, 128)	139264	block17_2_ac[0][0]
batch_normalization_288 (Batch Normalization)	(None, 3, 3, 128)	384	conv2d_288[0][0]
activation_288 (Activation)	(None, 3, 3, 128)	0	batch_normalization_288[0][0]

conv2d_289 (Conv2D)	(None, 3, 3, 160)	143360	activation_288[0][0]
batch_normalization_289 (Batch Normalization)	(None, 3, 3, 160)	480	conv2d_289[0][0]
activation_289 (Activation)	(None, 3, 3, 160)	0	batch_normalization_289[0][0]
conv2d_287 (Conv2D)	(None, 3, 3, 192)	208896	block17_2_ac[0][0]
conv2d_290 (Conv2D)	(None, 3, 3, 192)	215040	activation_289[0][0]
batch_normalization_287 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_287[0][0]
batch_normalization_290 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_290[0][0]
activation_287 (Activation)	(None, 3, 3, 192)	0	batch_normalization_287[0][0]
activation_290 (Activation)	(None, 3, 3, 192)	0	batch_normalization_290[0][0]
block17_3_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_287[0][0] activation_290[0][0]
block17_3_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_3_mixed[0][0]
block17_3 (Lambda)	(None, 3, 3, 1088)	0	block17_2_ac[0][0] block17_3_conv[0][0]
block17_3_ac (Activation)	(None, 3, 3, 1088)	0	block17_3[0][0]
conv2d_292 (Conv2D)	(None, 3, 3, 128)	139264	block17_3_ac[0][0]
batch_normalization_292 (Batch Normalization)	(None, 3, 3, 128)	384	conv2d_292[0][0]
activation_292 (Activation)	(None, 3, 3, 128)	0	batch_normalization_292[0][0]
conv2d_293 (Conv2D)	(None, 3, 3, 160)	143360	activation_292[0][0]
batch_normalization_293 (Batch Normalization)	(None, 3, 3, 160)	480	conv2d_293[0][0]
activation_293 (Activation)	(None, 3, 3, 160)	0	batch_normalization_293[0][0]

conv2d_291 (Conv2D)	(None, 3, 3, 192)	208896	block17_3_ac[0][0]
conv2d_294 (Conv2D)	(None, 3, 3, 192)	215040	activation_293[0][0]
batch_normalization_291 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_291[0][0]
batch_normalization_294 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_294[0][0]
activation_291 (Activation)	(None, 3, 3, 192)	0	batch_normalization_291[0][0]
activation_294 (Activation)	(None, 3, 3, 192)	0	batch_normalization_294[0][0]
block17_4_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_291[0][0] activation_294[0][0]
block17_4_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_4_mixed[0][0]
block17_4 (Lambda)	(None, 3, 3, 1088)	0	block17_3_ac[0][0] block17_4_conv[0][0]
block17_4_ac (Activation)	(None, 3, 3, 1088)	0	block17_4[0][0]
conv2d_296 (Conv2D)	(None, 3, 3, 128)	139264	block17_4_ac[0][0]
batch_normalization_296 (Batch Normalization)	(None, 3, 3, 128)	384	conv2d_296[0][0]
activation_296 (Activation)	(None, 3, 3, 128)	0	batch_normalization_296[0][0]
conv2d_297 (Conv2D)	(None, 3, 3, 160)	143360	activation_296[0][0]
batch_normalization_297 (Batch Normalization)	(None, 3, 3, 160)	480	conv2d_297[0][0]
activation_297 (Activation)	(None, 3, 3, 160)	0	batch_normalization_297[0][0]
conv2d_295 (Conv2D)	(None, 3, 3, 192)	208896	block17_4_ac[0][0]
conv2d_298 (Conv2D)	(None, 3, 3, 192)	215040	activation_297[0][0]
batch_normalization_295 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_295[0][0]
batch_normalization_298 (Batch Normalization)	(None, 3, 3, 192)	576	conv2d_298[0][0]

activation_295 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_295
activation_298 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_298
block17_5_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_295[0][0] activation_298[0][0]
block17_5_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_5_mixed[0][0]
block17_5 (Lambda)	(None, 3, 3, 1088)	0	block17_4_ac[0][0] block17_5_conv[0][0]
block17_5_ac (Activation)	(None, 3, 3, 1088)	0	block17_5[0][0]
conv2d_300 (Conv2D)	(None, 3, 3, 128)	139264	block17_5_ac[0][0]
batch_normalization_300 (BatchN	(None, 3, 3, 128)	384	conv2d_300[0][0]
activation_300 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_300
conv2d_301 (Conv2D)	(None, 3, 3, 160)	143360	activation_300[0][0]
batch_normalization_301 (BatchN	(None, 3, 3, 160)	480	conv2d_301[0][0]
activation_301 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_301
conv2d_299 (Conv2D)	(None, 3, 3, 192)	208896	block17_5_ac[0][0]
conv2d_302 (Conv2D)	(None, 3, 3, 192)	215040	activation_301[0][0]
batch_normalization_299 (BatchN	(None, 3, 3, 192)	576	conv2d_299[0][0]
batch_normalization_302 (BatchN	(None, 3, 3, 192)	576	conv2d_302[0][0]
activation_299 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_299
activation_302 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_302
block17_6_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_299[0][0] activation_302[0][0]

block17_6_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_6_mixed[0][0]
block17_6 (Lambda)	(None, 3, 3, 1088)	0	block17_5_ac[0][0] block17_6_conv[0][0]
block17_6_ac (Activation)	(None, 3, 3, 1088)	0	block17_6[0][0]
conv2d_304 (Conv2D)	(None, 3, 3, 128)	139264	block17_6_ac[0][0]
batch_normalization_304 (BatchN	(None, 3, 3, 128)	384	conv2d_304[0][0]
activation_304 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_304
conv2d_305 (Conv2D)	(None, 3, 3, 160)	143360	activation_304[0][0]
batch_normalization_305 (BatchN	(None, 3, 3, 160)	480	conv2d_305[0][0]
activation_305 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_305
conv2d_303 (Conv2D)	(None, 3, 3, 192)	208896	block17_6_ac[0][0]
conv2d_306 (Conv2D)	(None, 3, 3, 192)	215040	activation_305[0][0]
batch_normalization_303 (BatchN	(None, 3, 3, 192)	576	conv2d_303[0][0]
batch_normalization_306 (BatchN	(None, 3, 3, 192)	576	conv2d_306[0][0]
activation_303 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_303
activation_306 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_306
block17_7_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_303[0][0] activation_306[0][0]
block17_7_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_7_mixed[0][0]
block17_7 (Lambda)	(None, 3, 3, 1088)	0	block17_6_ac[0][0] block17_7_conv[0][0]
block17_7_ac (Activation)	(None, 3, 3, 1088)	0	block17_7[0][0]

conv2d_308 (Conv2D)	(None, 3, 3, 128)	139264	block17_7_ac[0][0]
batch_normalization_308 (BatchN	(None, 3, 3, 128)	384	conv2d_308[0][0]
activation_308 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_308
conv2d_309 (Conv2D)	(None, 3, 3, 160)	143360	activation_308[0][0]
batch_normalization_309 (BatchN	(None, 3, 3, 160)	480	conv2d_309[0][0]
activation_309 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_309
conv2d_307 (Conv2D)	(None, 3, 3, 192)	208896	block17_7_ac[0][0]
conv2d_310 (Conv2D)	(None, 3, 3, 192)	215040	activation_309[0][0]
batch_normalization_307 (BatchN	(None, 3, 3, 192)	576	conv2d_307[0][0]
batch_normalization_310 (BatchN	(None, 3, 3, 192)	576	conv2d_310[0][0]
activation_307 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_307
activation_310 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_310
block17_8_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_307[0][0] activation_310[0][0]
block17_8_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_8_mixed[0][0]
block17_8 (Lambda)	(None, 3, 3, 1088)	0	block17_7_ac[0][0] block17_8_conv[0][0]
block17_8_ac (Activation)	(None, 3, 3, 1088)	0	block17_8[0][0]
conv2d_312 (Conv2D)	(None, 3, 3, 128)	139264	block17_8_ac[0][0]
batch_normalization_312 (BatchN	(None, 3, 3, 128)	384	conv2d_312[0][0]
activation_312 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_312

conv2d_313 (Conv2D)	(None, 3, 3, 160)	143360	activation_312[0][0]
batch_normalization_313 (BatchN	(None, 3, 3, 160)	480	conv2d_313[0][0]
activation_313 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_313
conv2d_311 (Conv2D)	(None, 3, 3, 192)	208896	block17_8_ac[0][0]
conv2d_314 (Conv2D)	(None, 3, 3, 192)	215040	activation_313[0][0]
batch_normalization_311 (BatchN	(None, 3, 3, 192)	576	conv2d_311[0][0]
batch_normalization_314 (BatchN	(None, 3, 3, 192)	576	conv2d_314[0][0]
activation_311 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_311
activation_314 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_314
block17_9_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_311[0][0] activation_314[0][0]
block17_9_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_9_mixed[0][0]
block17_9 (Lambda)	(None, 3, 3, 1088)	0	block17_8_ac[0][0] block17_9_conv[0][0]
block17_9_ac (Activation)	(None, 3, 3, 1088)	0	block17_9[0][0]
conv2d_316 (Conv2D)	(None, 3, 3, 128)	139264	block17_9_ac[0][0]
batch_normalization_316 (BatchN	(None, 3, 3, 128)	384	conv2d_316[0][0]
activation_316 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_316
conv2d_317 (Conv2D)	(None, 3, 3, 160)	143360	activation_316[0][0]
batch_normalization_317 (BatchN	(None, 3, 3, 160)	480	conv2d_317[0][0]
activation_317 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_317
conv2d_315 (Conv2D)	(None, 3, 3, 192)	208896	block17_9_ac[0][0]

conv2d_318 (Conv2D)	(None, 3, 3, 192)	215040	activation_317[0][0]
batch_normalization_315 (BatchN	(None, 3, 3, 192)	576	conv2d_315[0][0]
batch_normalization_318 (BatchN	(None, 3, 3, 192)	576	conv2d_318[0][0]
activation_315 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_315
activation_318 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_318
block17_10_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_315[0][0] activation_318[0][0]
block17_10_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_10_mixed[0][0]
block17_10 (Lambda)	(None, 3, 3, 1088)	0	block17_9_ac[0][0] block17_10_conv[0][0]
block17_10_ac (Activation)	(None, 3, 3, 1088)	0	block17_10[0][0]
conv2d_320 (Conv2D)	(None, 3, 3, 128)	139264	block17_10_ac[0][0]
batch_normalization_320 (BatchN	(None, 3, 3, 128)	384	conv2d_320[0][0]
activation_320 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_320
conv2d_321 (Conv2D)	(None, 3, 3, 160)	143360	activation_320[0][0]
batch_normalization_321 (BatchN	(None, 3, 3, 160)	480	conv2d_321[0][0]
activation_321 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_321
conv2d_319 (Conv2D)	(None, 3, 3, 192)	208896	block17_10_ac[0][0]
conv2d_322 (Conv2D)	(None, 3, 3, 192)	215040	activation_321[0][0]
batch_normalization_319 (BatchN	(None, 3, 3, 192)	576	conv2d_319[0][0]
batch_normalization_322 (BatchN	(None, 3, 3, 192)	576	conv2d_322[0][0]

activation_319 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_319
activation_322 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_322
block17_11_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_319[0][0] activation_322[0][0]
block17_11_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_11_mixed[0][0]
block17_11 (Lambda)	(None, 3, 3, 1088)	0	block17_10_ac[0][0] block17_11_conv[0][0]
block17_11_ac (Activation)	(None, 3, 3, 1088)	0	block17_11[0][0]
conv2d_324 (Conv2D)	(None, 3, 3, 128)	139264	block17_11_ac[0][0]
batch_normalization_324 (BatchN	(None, 3, 3, 128)	384	conv2d_324[0][0]
activation_324 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_324
conv2d_325 (Conv2D)	(None, 3, 3, 160)	143360	activation_324[0][0]
batch_normalization_325 (BatchN	(None, 3, 3, 160)	480	conv2d_325[0][0]
activation_325 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_325
conv2d_323 (Conv2D)	(None, 3, 3, 192)	208896	block17_11_ac[0][0]
conv2d_326 (Conv2D)	(None, 3, 3, 192)	215040	activation_325[0][0]
batch_normalization_323 (BatchN	(None, 3, 3, 192)	576	conv2d_323[0][0]
batch_normalization_326 (BatchN	(None, 3, 3, 192)	576	conv2d_326[0][0]
activation_323 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_323
activation_326 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_326
block17_12_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_323[0][0] activation_326[0][0]

block17_12_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_12_mixed[0][0]
block17_12 (Lambda)	(None, 3, 3, 1088)	0	block17_11_ac[0][0] block17_12_conv[0][0]
block17_12_ac (Activation)	(None, 3, 3, 1088)	0	block17_12[0][0]
conv2d_328 (Conv2D)	(None, 3, 3, 128)	139264	block17_12_ac[0][0]
batch_normalization_328 (BatchN	(None, 3, 3, 128)	384	conv2d_328[0][0]
activation_328 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_328
conv2d_329 (Conv2D)	(None, 3, 3, 160)	143360	activation_328[0][0]
batch_normalization_329 (BatchN	(None, 3, 3, 160)	480	conv2d_329[0][0]
activation_329 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_329
conv2d_327 (Conv2D)	(None, 3, 3, 192)	208896	block17_12_ac[0][0]
conv2d_330 (Conv2D)	(None, 3, 3, 192)	215040	activation_329[0][0]
batch_normalization_327 (BatchN	(None, 3, 3, 192)	576	conv2d_327[0][0]
batch_normalization_330 (BatchN	(None, 3, 3, 192)	576	conv2d_330[0][0]
activation_327 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_327
activation_330 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_330
block17_13_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_327[0][0] activation_330[0][0]
block17_13_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_13_mixed[0][0]
block17_13 (Lambda)	(None, 3, 3, 1088)	0	block17_12_ac[0][0] block17_13_conv[0][0]
block17_13_ac (Activation)	(None, 3, 3, 1088)	0	block17_13[0][0]

conv2d_332 (Conv2D)	(None, 3, 3, 128)	139264	block17_13_ac[0][0]
batch_normalization_332 (BatchN	(None, 3, 3, 128)	384	conv2d_332[0][0]
activation_332 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_332
conv2d_333 (Conv2D)	(None, 3, 3, 160)	143360	activation_332[0][0]
batch_normalization_333 (BatchN	(None, 3, 3, 160)	480	conv2d_333[0][0]
activation_333 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_333
conv2d_331 (Conv2D)	(None, 3, 3, 192)	208896	block17_13_ac[0][0]
conv2d_334 (Conv2D)	(None, 3, 3, 192)	215040	activation_333[0][0]
batch_normalization_331 (BatchN	(None, 3, 3, 192)	576	conv2d_331[0][0]
batch_normalization_334 (BatchN	(None, 3, 3, 192)	576	conv2d_334[0][0]
activation_331 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_331
activation_334 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_334
block17_14_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_331[0][0] activation_334[0][0]
block17_14_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_14_mixed[0][0]
block17_14 (Lambda)	(None, 3, 3, 1088)	0	block17_13_ac[0][0] block17_14_conv[0][0]
block17_14_ac (Activation)	(None, 3, 3, 1088)	0	block17_14[0][0]
conv2d_336 (Conv2D)	(None, 3, 3, 128)	139264	block17_14_ac[0][0]
batch_normalization_336 (BatchN	(None, 3, 3, 128)	384	conv2d_336[0][0]
activation_336 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_336
conv2d_337 (Conv2D)	(None, 3, 3, 160)	143360	activation_336[0][0]

batch_normalization_337 (BatchN	(None, 3, 3, 160)	480	conv2d_337[0][0]
activation_337 (Activation)	(None, 3, 3, 160)	0	batch_normalization_337[0][0]
conv2d_335 (Conv2D)	(None, 3, 3, 192)	208896	block17_14_ac[0][0]
conv2d_338 (Conv2D)	(None, 3, 3, 192)	215040	activation_337[0][0]
batch_normalization_335 (BatchN	(None, 3, 3, 192)	576	conv2d_335[0][0]
batch_normalization_338 (BatchN	(None, 3, 3, 192)	576	conv2d_338[0][0]
activation_335 (Activation)	(None, 3, 3, 192)	0	batch_normalization_335[0][0]
activation_338 (Activation)	(None, 3, 3, 192)	0	batch_normalization_338[0][0]
block17_15_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_335[0][0] activation_338[0][0]
block17_15_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_15_mixed[0][0]
block17_15 (Lambda)	(None, 3, 3, 1088)	0	block17_14_ac[0][0] block17_15_conv[0][0]
block17_15_ac (Activation)	(None, 3, 3, 1088)	0	block17_15[0][0]
conv2d_340 (Conv2D)	(None, 3, 3, 128)	139264	block17_15_ac[0][0]
batch_normalization_340 (BatchN	(None, 3, 3, 128)	384	conv2d_340[0][0]
activation_340 (Activation)	(None, 3, 3, 128)	0	batch_normalization_340[0][0]
conv2d_341 (Conv2D)	(None, 3, 3, 160)	143360	activation_340[0][0]
batch_normalization_341 (BatchN	(None, 3, 3, 160)	480	conv2d_341[0][0]
activation_341 (Activation)	(None, 3, 3, 160)	0	batch_normalization_341[0][0]
conv2d_339 (Conv2D)	(None, 3, 3, 192)	208896	block17_15_ac[0][0]

conv2d_342 (Conv2D)	(None, 3, 3, 192)	215040	activation_341[0][0]
batch_normalization_339 (BatchN	(None, 3, 3, 192)	576	conv2d_339[0][0]
batch_normalization_342 (BatchN	(None, 3, 3, 192)	576	conv2d_342[0][0]
activation_339 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_339
activation_342 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_342
block17_16_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_339[0][0] activation_342[0][0]
block17_16_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_16_mixed[0][0]
block17_16 (Lambda)	(None, 3, 3, 1088)	0	block17_15_ac[0][0] block17_16_conv[0][0]
block17_16_ac (Activation)	(None, 3, 3, 1088)	0	block17_16[0][0]
conv2d_344 (Conv2D)	(None, 3, 3, 128)	139264	block17_16_ac[0][0]
batch_normalization_344 (BatchN	(None, 3, 3, 128)	384	conv2d_344[0][0]
activation_344 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_344
conv2d_345 (Conv2D)	(None, 3, 3, 160)	143360	activation_344[0][0]
batch_normalization_345 (BatchN	(None, 3, 3, 160)	480	conv2d_345[0][0]
activation_345 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_345
conv2d_343 (Conv2D)	(None, 3, 3, 192)	208896	block17_16_ac[0][0]
conv2d_346 (Conv2D)	(None, 3, 3, 192)	215040	activation_345[0][0]
batch_normalization_343 (BatchN	(None, 3, 3, 192)	576	conv2d_343[0][0]
batch_normalization_346 (BatchN	(None, 3, 3, 192)	576	conv2d_346[0][0]
activation_343 (Activation)	(None, 3, 3, 192)	0	batch_normalization_343

[0][0]

activation_346 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_346
block17_17_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_343[0][0] activation_346[0][0]
block17_17_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_17_mixed[0][0]
block17_17 (Lambda)	(None, 3, 3, 1088)	0	block17_16_ac[0][0] block17_17_conv[0][0]
block17_17_ac (Activation)	(None, 3, 3, 1088)	0	block17_17[0][0]
conv2d_348 (Conv2D)	(None, 3, 3, 128)	139264	block17_17_ac[0][0]
batch_normalization_348 (BatchN	(None, 3, 3, 128)	384	conv2d_348[0][0]
activation_348 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_348
conv2d_349 (Conv2D)	(None, 3, 3, 160)	143360	activation_348[0][0]
batch_normalization_349 (BatchN	(None, 3, 3, 160)	480	conv2d_349[0][0]
activation_349 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_349
conv2d_347 (Conv2D)	(None, 3, 3, 192)	208896	block17_17_ac[0][0]
conv2d_350 (Conv2D)	(None, 3, 3, 192)	215040	activation_349[0][0]
batch_normalization_347 (BatchN	(None, 3, 3, 192)	576	conv2d_347[0][0]
batch_normalization_350 (BatchN	(None, 3, 3, 192)	576	conv2d_350[0][0]
activation_347 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_347
activation_350 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_350
block17_18_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_347[0][0] activation_350[0][0]

block17_18_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_18_mixed[0][0]
block17_18 (Lambda)	(None, 3, 3, 1088)	0	block17_17_ac[0][0] block17_18_conv[0][0]
block17_18_ac (Activation)	(None, 3, 3, 1088)	0	block17_18[0][0]
conv2d_352 (Conv2D)	(None, 3, 3, 128)	139264	block17_18_ac[0][0]
batch_normalization_352 (BatchN	(None, 3, 3, 128)	384	conv2d_352[0][0]
activation_352 (Activation) [0][0]	(None, 3, 3, 128)	0	batch_normalization_352
conv2d_353 (Conv2D)	(None, 3, 3, 160)	143360	activation_352[0][0]
batch_normalization_353 (BatchN	(None, 3, 3, 160)	480	conv2d_353[0][0]
activation_353 (Activation) [0][0]	(None, 3, 3, 160)	0	batch_normalization_353
conv2d_351 (Conv2D)	(None, 3, 3, 192)	208896	block17_18_ac[0][0]
conv2d_354 (Conv2D)	(None, 3, 3, 192)	215040	activation_353[0][0]
batch_normalization_351 (BatchN	(None, 3, 3, 192)	576	conv2d_351[0][0]
batch_normalization_354 (BatchN	(None, 3, 3, 192)	576	conv2d_354[0][0]
activation_351 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_351
activation_354 (Activation) [0][0]	(None, 3, 3, 192)	0	batch_normalization_354
block17_19_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_351[0][0] activation_354[0][0]
block17_19_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_19_mixed[0][0]
block17_19 (Lambda)	(None, 3, 3, 1088)	0	block17_18_ac[0][0] block17_19_conv[0][0]
block17_19_ac (Activation)	(None, 3, 3, 1088)	0	block17_19[0][0]
conv2d_356 (Conv2D)	(None, 3, 3, 128)	139264	block17_19_ac[0][0]

batch_normalization_356 (BatchN	(None, 3, 3, 128)	384	conv2d_356[0][0]
activation_356 (Activation)	(None, 3, 3, 128)	0	batch_normalization_356[0][0]
conv2d_357 (Conv2D)	(None, 3, 3, 160)	143360	activation_356[0][0]
batch_normalization_357 (BatchN	(None, 3, 3, 160)	480	conv2d_357[0][0]
activation_357 (Activation)	(None, 3, 3, 160)	0	batch_normalization_357[0][0]
conv2d_355 (Conv2D)	(None, 3, 3, 192)	208896	block17_19_ac[0][0]
conv2d_358 (Conv2D)	(None, 3, 3, 192)	215040	activation_357[0][0]
batch_normalization_355 (BatchN	(None, 3, 3, 192)	576	conv2d_355[0][0]
batch_normalization_358 (BatchN	(None, 3, 3, 192)	576	conv2d_358[0][0]
activation_355 (Activation)	(None, 3, 3, 192)	0	batch_normalization_355[0][0]
activation_358 (Activation)	(None, 3, 3, 192)	0	batch_normalization_358[0][0]
block17_20_mixed (Concatenate)	(None, 3, 3, 384)	0	activation_355[0][0] activation_358[0][0]
block17_20_conv (Conv2D)	(None, 3, 3, 1088)	418880	block17_20_mixed[0][0]
block17_20 (Lambda)	(None, 3, 3, 1088)	0	block17_19_ac[0][0] block17_20_conv[0][0]
block17_20_ac (Activation)	(None, 3, 3, 1088)	0	block17_20[0][0]
conv2d_363 (Conv2D)	(None, 3, 3, 256)	278528	block17_20_ac[0][0]
batch_normalization_363 (BatchN	(None, 3, 3, 256)	768	conv2d_363[0][0]
activation_363 (Activation)	(None, 3, 3, 256)	0	batch_normalization_363[0][0]
conv2d_359 (Conv2D)	(None, 3, 3, 256)	278528	block17_20_ac[0][0]

conv2d_361 (Conv2D)	(None, 3, 3, 256)	278528	block17_20_ac[0][0]
conv2d_364 (Conv2D)	(None, 3, 3, 288)	663552	activation_363[0][0]
batch_normalization_359 (BatchN	(None, 3, 3, 256)	768	conv2d_359[0][0]
batch_normalization_361 (BatchN	(None, 3, 3, 256)	768	conv2d_361[0][0]
batch_normalization_364 (BatchN	(None, 3, 3, 288)	864	conv2d_364[0][0]
activation_359 (Activation) [0][0]	(None, 3, 3, 256)	0	batch_normalization_359
activation_361 (Activation) [0][0]	(None, 3, 3, 256)	0	batch_normalization_361
activation_364 (Activation) [0][0]	(None, 3, 3, 288)	0	batch_normalization_364
conv2d_360 (Conv2D)	(None, 1, 1, 384)	884736	activation_359[0][0]
conv2d_362 (Conv2D)	(None, 1, 1, 288)	663552	activation_361[0][0]
conv2d_365 (Conv2D)	(None, 1, 1, 320)	829440	activation_364[0][0]
batch_normalization_360 (BatchN	(None, 1, 1, 384)	1152	conv2d_360[0][0]
batch_normalization_362 (BatchN	(None, 1, 1, 288)	864	conv2d_362[0][0]
batch_normalization_365 (BatchN	(None, 1, 1, 320)	960	conv2d_365[0][0]
activation_360 (Activation) [0][0]	(None, 1, 1, 384)	0	batch_normalization_360
activation_362 (Activation) [0][0]	(None, 1, 1, 288)	0	batch_normalization_362
activation_365 (Activation) [0][0]	(None, 1, 1, 320)	0	batch_normalization_365
max_pooling2d_7 (MaxPooling2D)	(None, 1, 1, 1088)	0	block17_20_ac[0][0]
mixed_7a (Concatenate)	(None, 1, 1, 2080)	0	activation_360[0][0] activation_362[0][0] activation_365[0][0] max_pooling2d_7[0][0]

conv2d_367 (Conv2D)	(None, 1, 1, 192)	399360	mixed_7a[0][0]
batch_normalization_367 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_367[0][0]
activation_367 (Activation)	(None, 1, 1, 192)	0	batch_normalization_367[0][0]
conv2d_368 (Conv2D)	(None, 1, 1, 224)	129024	activation_367[0][0]
batch_normalization_368 (Batch Normalization)	(None, 1, 1, 224)	672	conv2d_368[0][0]
activation_368 (Activation)	(None, 1, 1, 224)	0	batch_normalization_368[0][0]
conv2d_366 (Conv2D)	(None, 1, 1, 192)	399360	mixed_7a[0][0]
conv2d_369 (Conv2D)	(None, 1, 1, 256)	172032	activation_368[0][0]
batch_normalization_366 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_366[0][0]
batch_normalization_369 (Batch Normalization)	(None, 1, 1, 256)	768	conv2d_369[0][0]
activation_366 (Activation)	(None, 1, 1, 192)	0	batch_normalization_366[0][0]
activation_369 (Activation)	(None, 1, 1, 256)	0	batch_normalization_369[0][0]
block8_1_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_366[0][0] activation_369[0][0]
block8_1_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_1_mixed[0][0]
block8_1 (Lambda)	(None, 1, 1, 2080)	0	mixed_7a[0][0] block8_1_conv[0][0]
block8_1_ac (Activation)	(None, 1, 1, 2080)	0	block8_1[0][0]
conv2d_371 (Conv2D)	(None, 1, 1, 192)	399360	block8_1_ac[0][0]
batch_normalization_371 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_371[0][0]
activation_371 (Activation)	(None, 1, 1, 192)	0	batch_normalization_371[0][0]

conv2d_372 (Conv2D)	(None, 1, 1, 224)	129024	activation_371[0][0]
batch_normalization_372 (BatchN	(None, 1, 1, 224)	672	conv2d_372[0][0]
activation_372 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_372
conv2d_370 (Conv2D)	(None, 1, 1, 192)	399360	block8_1_ac[0][0]
conv2d_373 (Conv2D)	(None, 1, 1, 256)	172032	activation_372[0][0]
batch_normalization_370 (BatchN	(None, 1, 1, 192)	576	conv2d_370[0][0]
batch_normalization_373 (BatchN	(None, 1, 1, 256)	768	conv2d_373[0][0]
activation_370 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_370
activation_373 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_373
block8_2_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_370[0][0] activation_373[0][0]
block8_2_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_2_mixed[0][0]
block8_2 (Lambda)	(None, 1, 1, 2080)	0	block8_1_ac[0][0] block8_2_conv[0][0]
block8_2_ac (Activation)	(None, 1, 1, 2080)	0	block8_2[0][0]
conv2d_375 (Conv2D)	(None, 1, 1, 192)	399360	block8_2_ac[0][0]
batch_normalization_375 (BatchN	(None, 1, 1, 192)	576	conv2d_375[0][0]
activation_375 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_375
conv2d_376 (Conv2D)	(None, 1, 1, 224)	129024	activation_375[0][0]
batch_normalization_376 (BatchN	(None, 1, 1, 224)	672	conv2d_376[0][0]
activation_376 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_376

conv2d_374 (Conv2D)	(None, 1, 1, 192)	399360	block8_2_ac[0][0]
conv2d_377 (Conv2D)	(None, 1, 1, 256)	172032	activation_376[0][0]
batch_normalization_374 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_374[0][0]
batch_normalization_377 (Batch Normalization)	(None, 1, 1, 256)	768	conv2d_377[0][0]
activation_374 (Activation)	(None, 1, 1, 192)	0	batch_normalization_374[0][0]
activation_377 (Activation)	(None, 1, 1, 256)	0	batch_normalization_377[0][0]
block8_3_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_374[0][0] activation_377[0][0]
block8_3_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_3_mixed[0][0]
block8_3 (Lambda)	(None, 1, 1, 2080)	0	block8_2_ac[0][0] block8_3_conv[0][0]
block8_3_ac (Activation)	(None, 1, 1, 2080)	0	block8_3[0][0]
conv2d_379 (Conv2D)	(None, 1, 1, 192)	399360	block8_3_ac[0][0]
batch_normalization_379 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_379[0][0]
activation_379 (Activation)	(None, 1, 1, 192)	0	batch_normalization_379[0][0]
conv2d_380 (Conv2D)	(None, 1, 1, 224)	129024	activation_379[0][0]
batch_normalization_380 (Batch Normalization)	(None, 1, 1, 224)	672	conv2d_380[0][0]
activation_380 (Activation)	(None, 1, 1, 224)	0	batch_normalization_380[0][0]
conv2d_378 (Conv2D)	(None, 1, 1, 192)	399360	block8_3_ac[0][0]
conv2d_381 (Conv2D)	(None, 1, 1, 256)	172032	activation_380[0][0]
batch_normalization_378 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_378[0][0]
batch_normalization_381 (Batch Normalization)	(None, 1, 1, 256)	768	conv2d_381[0][0]

activation_378 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_378
activation_381 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_381
block8_4_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_378[0][0] activation_381[0][0]
block8_4_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_4_mixed[0][0]
block8_4 (Lambda)	(None, 1, 1, 2080)	0	block8_3_ac[0][0] block8_4_conv[0][0]
block8_4_ac (Activation)	(None, 1, 1, 2080)	0	block8_4[0][0]
conv2d_383 (Conv2D)	(None, 1, 1, 192)	399360	block8_4_ac[0][0]
batch_normalization_383 (BatchN	(None, 1, 1, 192)	576	conv2d_383[0][0]
activation_383 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_383
conv2d_384 (Conv2D)	(None, 1, 1, 224)	129024	activation_383[0][0]
batch_normalization_384 (BatchN	(None, 1, 1, 224)	672	conv2d_384[0][0]
activation_384 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_384
conv2d_382 (Conv2D)	(None, 1, 1, 192)	399360	block8_4_ac[0][0]
conv2d_385 (Conv2D)	(None, 1, 1, 256)	172032	activation_384[0][0]
batch_normalization_382 (BatchN	(None, 1, 1, 192)	576	conv2d_382[0][0]
batch_normalization_385 (BatchN	(None, 1, 1, 256)	768	conv2d_385[0][0]
activation_382 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_382
activation_385 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_385
block8_5_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_382[0][0] activation_385[0][0]

block8_5_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_5_mixed[0][0]
block8_5 (Lambda)	(None, 1, 1, 2080)	0	block8_4_ac[0][0] block8_5_conv[0][0]
block8_5_ac (Activation)	(None, 1, 1, 2080)	0	block8_5[0][0]
conv2d_387 (Conv2D)	(None, 1, 1, 192)	399360	block8_5_ac[0][0]
batch_normalization_387 (BatchN	(None, 1, 1, 192)	576	conv2d_387[0][0]
activation_387 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_387
conv2d_388 (Conv2D)	(None, 1, 1, 224)	129024	activation_387[0][0]
batch_normalization_388 (BatchN	(None, 1, 1, 224)	672	conv2d_388[0][0]
activation_388 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_388
conv2d_386 (Conv2D)	(None, 1, 1, 192)	399360	block8_5_ac[0][0]
conv2d_389 (Conv2D)	(None, 1, 1, 256)	172032	activation_388[0][0]
batch_normalization_386 (BatchN	(None, 1, 1, 192)	576	conv2d_386[0][0]
batch_normalization_389 (BatchN	(None, 1, 1, 256)	768	conv2d_389[0][0]
activation_386 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_386
activation_389 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_389
block8_6_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_386[0][0] activation_389[0][0]
block8_6_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_6_mixed[0][0]
block8_6 (Lambda)	(None, 1, 1, 2080)	0	block8_5_ac[0][0] block8_6_conv[0][0]
block8_6_ac (Activation)	(None, 1, 1, 2080)	0	block8_6[0][0]

conv2d_391 (Conv2D)	(None, 1, 1, 192)	399360	block8_6_ac[0][0]
batch_normalization_391 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_391[0][0]
activation_391 (Activation)	(None, 1, 1, 192)	0	batch_normalization_391[0][0]
conv2d_392 (Conv2D)	(None, 1, 1, 224)	129024	activation_391[0][0]
batch_normalization_392 (Batch Normalization)	(None, 1, 1, 224)	672	conv2d_392[0][0]
activation_392 (Activation)	(None, 1, 1, 224)	0	batch_normalization_392[0][0]
conv2d_390 (Conv2D)	(None, 1, 1, 192)	399360	block8_6_ac[0][0]
conv2d_393 (Conv2D)	(None, 1, 1, 256)	172032	activation_392[0][0]
batch_normalization_390 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_390[0][0]
batch_normalization_393 (Batch Normalization)	(None, 1, 1, 256)	768	conv2d_393[0][0]
activation_390 (Activation)	(None, 1, 1, 192)	0	batch_normalization_390[0][0]
activation_393 (Activation)	(None, 1, 1, 256)	0	batch_normalization_393[0][0]
block8_7_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_390[0][0] activation_393[0][0]
block8_7_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_7_mixed[0][0]
block8_7 (Lambda)	(None, 1, 1, 2080)	0	block8_6_ac[0][0] block8_7_conv[0][0]
block8_7_ac (Activation)	(None, 1, 1, 2080)	0	block8_7[0][0]
conv2d_395 (Conv2D)	(None, 1, 1, 192)	399360	block8_7_ac[0][0]
batch_normalization_395 (Batch Normalization)	(None, 1, 1, 192)	576	conv2d_395[0][0]
activation_395 (Activation)	(None, 1, 1, 192)	0	batch_normalization_395[0][0]

conv2d_396 (Conv2D)	(None, 1, 1, 224)	129024	activation_395[0][0]
batch_normalization_396 (BatchN	(None, 1, 1, 224)	672	conv2d_396[0][0]
activation_396 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_396
conv2d_394 (Conv2D)	(None, 1, 1, 192)	399360	block8_7_ac[0][0]
conv2d_397 (Conv2D)	(None, 1, 1, 256)	172032	activation_396[0][0]
batch_normalization_394 (BatchN	(None, 1, 1, 192)	576	conv2d_394[0][0]
batch_normalization_397 (BatchN	(None, 1, 1, 256)	768	conv2d_397[0][0]
activation_394 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_394
activation_397 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_397
block8_8_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_394[0][0] activation_397[0][0]
block8_8_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_8_mixed[0][0]
block8_8 (Lambda)	(None, 1, 1, 2080)	0	block8_7_ac[0][0] block8_8_conv[0][0]
block8_8_ac (Activation)	(None, 1, 1, 2080)	0	block8_8[0][0]
conv2d_399 (Conv2D)	(None, 1, 1, 192)	399360	block8_8_ac[0][0]
batch_normalization_399 (BatchN	(None, 1, 1, 192)	576	conv2d_399[0][0]
activation_399 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_399
conv2d_400 (Conv2D)	(None, 1, 1, 224)	129024	activation_399[0][0]
batch_normalization_400 (BatchN	(None, 1, 1, 224)	672	conv2d_400[0][0]
activation_400 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_400
conv2d_398 (Conv2D)	(None, 1, 1, 192)	399360	block8_8_ac[0][0]

conv2d_401 (Conv2D)	(None, 1, 1, 256)	172032	activation_400[0][0]
batch_normalization_398 (BatchN	(None, 1, 1, 192)	576	conv2d_398[0][0]
batch_normalization_401 (BatchN	(None, 1, 1, 256)	768	conv2d_401[0][0]
activation_398 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_398
activation_401 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_401
block8_9_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_398[0][0] activation_401[0][0]
block8_9_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_9_mixed[0][0]
block8_9 (Lambda)	(None, 1, 1, 2080)	0	block8_8_ac[0][0] block8_9_conv[0][0]
block8_9_ac (Activation)	(None, 1, 1, 2080)	0	block8_9[0][0]
conv2d_403 (Conv2D)	(None, 1, 1, 192)	399360	block8_9_ac[0][0]
batch_normalization_403 (BatchN	(None, 1, 1, 192)	576	conv2d_403[0][0]
activation_403 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_403
conv2d_404 (Conv2D)	(None, 1, 1, 224)	129024	activation_403[0][0]
batch_normalization_404 (BatchN	(None, 1, 1, 224)	672	conv2d_404[0][0]
activation_404 (Activation) [0][0]	(None, 1, 1, 224)	0	batch_normalization_404
conv2d_402 (Conv2D)	(None, 1, 1, 192)	399360	block8_9_ac[0][0]
conv2d_405 (Conv2D)	(None, 1, 1, 256)	172032	activation_404[0][0]
batch_normalization_402 (BatchN	(None, 1, 1, 192)	576	conv2d_402[0][0]
batch_normalization_405 (BatchN	(None, 1, 1, 256)	768	conv2d_405[0][0]

activation_402 (Activation) [0][0]	(None, 1, 1, 192)	0	batch_normalization_402
activation_405 (Activation) [0][0]	(None, 1, 1, 256)	0	batch_normalization_405
block8_10_mixed (Concatenate)	(None, 1, 1, 448)	0	activation_402[0][0] activation_405[0][0]
block8_10_conv (Conv2D)	(None, 1, 1, 2080)	933920	block8_10_mixed[0][0]
block8_10 (Lambda)	(None, 1, 1, 2080)	0	block8_9_ac[0][0] block8_10_conv[0][0]
conv_7b (Conv2D)	(None, 1, 1, 1536)	3194880	block8_10[0][0]
conv_7b_bn (BatchNormalization)	(None, 1, 1, 1536)	4608	conv_7b[0][0]
conv_7b_ac (Activation)	(None, 1, 1, 1536)	0	conv_7b_bn[0][0]
flatten_1 (Flatten)	(None, 1536)	0	conv_7b_ac[0][0]
dense_2 (Dense)	(None, 1024)	1573888	flatten_1[0][0]
dense_3 (Dense)	(None, 6)	6150	dense_2[0][0]
=====			
Total params: 55,916,774			
Trainable params: 55,856,230			
Non-trainable params: 60,544			

time: 320 ms (started: 2021-01-05 22:29:16 +00:00)

Loading Data

```
In [31]: # A function to load data from a given directory
def load_data(data_dir):
    data = []
    labels = []
    class_dirs = os.listdir(data_dir)

    for direc in class_dirs:
        class_dir = os.path.join(data_dir, direc)
        for imagepath in tqdm(list(paths.list_images(class_dir))):
            image = cv2.imread(imagepath)
            image = cv2.resize(image, (img_width, img_height)) # incase images not of same s
            data.append(image)
            labels.append(direc)
    # normalizing and converting to numpy array format
```

```
data = np.array(data, dtype='float')/255.0
labels = np.array(labels)
return data, labels
```

time: 7.43 ms (started: 2021-01-05 22:29:17 +00:00)

```
In [32]: train_dir = "/content/drive/MyDrive/CV/Assignment 3/seg_train/seg_train/"
test_dir = "/content/drive/MyDrive/CV/Assignment 3/seg_test/seg_test/"
pred_dir = "/content/drive/MyDrive/CV/Assignment 3/pred/seg_pred/seg_pred/"
```

time: 804 µs (started: 2021-01-05 22:29:17 +00:00)

```
In [33]: from google.colab import drive
drive.mount('/content/drive')
```

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

time: 2.16 ms (started: 2021-01-05 22:29:17 +00:00)

```
In [34]: print('loading train images')
X_train, y_train = load_data(train_dir)
```

loading train images

```
100%|██████████| 2191/2191 [00:06<00:00, 350.67it/s]
100%|██████████| 2271/2271 [00:06<00:00, 338.24it/s]
100%|██████████| 2404/2404 [00:06<00:00, 356.20it/s]
100%|██████████| 2512/2512 [00:07<00:00, 357.04it/s]
100%|██████████| 2274/2274 [00:06<00:00, 362.63it/s]
100%|██████████| 2382/2382 [00:06<00:00, 349.43it/s]
```

time: 44.9 s (started: 2021-01-05 22:29:17 +00:00)

```
In [35]: X_valid, y_valid = load_data(test_dir)
```

```
100%|██████████| 437/437 [00:01<00:00, 316.11it/s]
100%|██████████| 474/474 [00:01<00:00, 311.99it/s]
100%|██████████| 553/553 [00:01<00:00, 336.27it/s]
100%|██████████| 525/525 [00:01<00:00, 345.10it/s]
100%|██████████| 510/510 [00:01<00:00, 340.71it/s]
100%|██████████| 501/501 [00:01<00:00, 341.91it/s]
```

time: 9.39 s (started: 2021-01-05 22:30:02 +00:00)

```
In [36]: X_train = np.append(X_train, X_valid, axis=0)
y_train = np.append(y_train, y_valid, axis=0)
```

time: 3.54 s (started: 2021-01-05 22:30:11 +00:00)

```
In [37]: lb = LabelBinarizer()
y_train = lb.fit_transform(y_train)
```

time: 32.9 ms (started: 2021-01-05 22:30:14 +00:00)

```
In [38]: from sklearn.model_selection import train_test_split
(X_train, X_valid, y_train, y_valid) = train_test_split(X_train, y_train, test_size=0.2)
```

time: 1.04 s (started: 2021-01-05 22:30:15 +00:00)

Compile the model

```
In [39]: # from keras.optimizers import SGD
# sgd = SGD(lr=0.001, decay=1e-7, momentum=.9)
# model.compile(loss='categorical_crossentropy', optimizer=sgd, metrics=['accuracy'])
```

time: 67.8 ms (started: 2021-01-05 22:30:16 +00:00)

```
In [53]: model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])
```

time: 32 ms (started: 2021-01-05 23:19:20 +00:00)

Train the model

```
In [54]: H = model.fit(X_train, y_train, batch_size=128,
                      epochs=10,
                      validation_data=(X_valid, y_valid))
```

```
Epoch 1/10
107/107 [=====] - 44s 270ms/step - loss: 0.7335 - accuracy: 0.8
265 - val_loss: 3.9029 - val_accuracy: 0.7088
Epoch 2/10
107/107 [=====] - 26s 246ms/step - loss: 0.2190 - accuracy: 0.9
229 - val_loss: 0.4037 - val_accuracy: 0.8647
Epoch 3/10
107/107 [=====] - 27s 250ms/step - loss: 0.1470 - accuracy: 0.9
508 - val_loss: 6.9940 - val_accuracy: 0.7194
Epoch 4/10
107/107 [=====] - 27s 252ms/step - loss: 0.1142 - accuracy: 0.9
618 - val_loss: 2.1347 - val_accuracy: 0.6936
Epoch 5/10
107/107 [=====] - 27s 254ms/step - loss: 0.1133 - accuracy: 0.9
603 - val_loss: 1.0292 - val_accuracy: 0.8556
Epoch 6/10
107/107 [=====] - 27s 256ms/step - loss: 0.0689 - accuracy: 0.9
797 - val_loss: 10.0324 - val_accuracy: 0.6783
Epoch 7/10
107/107 [=====] - 28s 258ms/step - loss: 0.1209 - accuracy: 0.9
587 - val_loss: 0.5783 - val_accuracy: 0.8321
Epoch 8/10
107/107 [=====] - 28s 260ms/step - loss: 0.1149 - accuracy: 0.9
604 - val_loss: 0.7037 - val_accuracy: 0.8080
Epoch 9/10
107/107 [=====] - 28s 260ms/step - loss: 0.0742 - accuracy: 0.9
732 - val_loss: 0.8264 - val_accuracy: 0.8412
Epoch 10/10
107/107 [=====] - 28s 260ms/step - loss: 0.1151 - accuracy: 0.9
618 - val_loss: 134.1350 - val_accuracy: 0.7617
time: 4min 50s (started: 2021-01-05 23:19:24 +00:00)
```

```
In [55]: # save the model's trained weights
model.save_weights('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2_RMSprop_tr
```

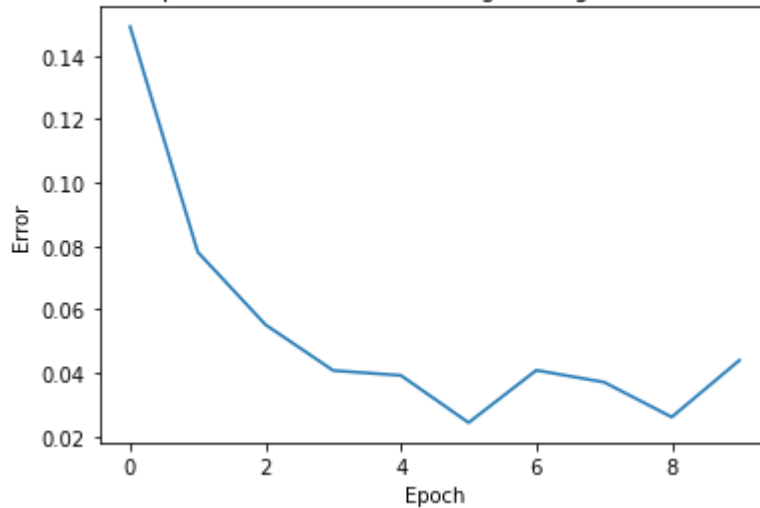
time: 1.91 s (started: 2021-01-05 23:24:17 +00:00)

```
In [42]: # model.load_weights('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2_transfer_
```

time: 1.04 ms (started: 2021-01-05 22:35:06 +00:00)

```
In [56]: simple_acc = H.history['accuracy']
plt.plot([1 - acc for acc in simple_acc])
plt.title('Error for a InceptionResNetV2 model using No augmentation with RMSprop')
plt.ylabel('Error')
plt.xlabel('Epoch')
plt.savefig('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2/RMSprop_simple_ac
plt.show()
```

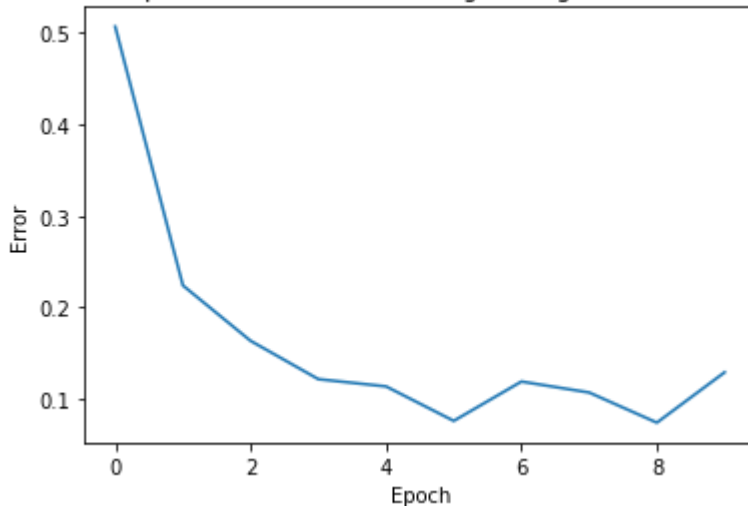
Error for a InceptionResNetV2 model using No augmentation with RMSprop



time: 192 ms (started: 2021-01-05 23:24:18 +00:00)

```
In [57]: simple_loss = H.history['loss']
plt.plot([los for los in simple_loss])
plt.title('Loss for a InceptionResNetV2 model using No augmentation with RMSprop')
plt.ylabel('Error')
plt.xlabel('Epoch')
plt.savefig('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2/RMSprop_simple_lo
plt.show()
```

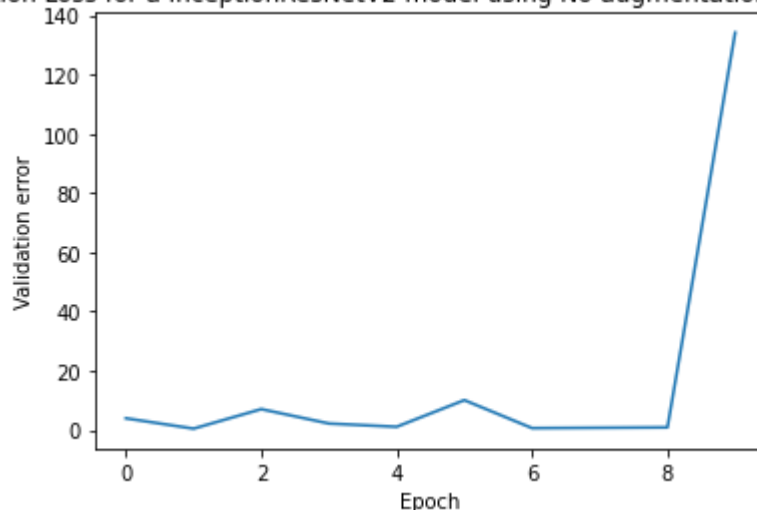
Loss for a InceptionResNetV2 model using No augmentation with RMSprop



time: 170 ms (started: 2021-01-05 23:24:20 +00:00)

```
In [58]: simple_val_loss = H.history['val_loss']
plt.plot([los for los in simple_val_loss])
plt.title('Validation Loss for a InceptionResNetV2 model using No augmentation with RMS
plt.ylabel('Validation error')
plt.xlabel('Epoch')
plt.savefig('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2/RMSprop_simple_Va
plt.show()
```

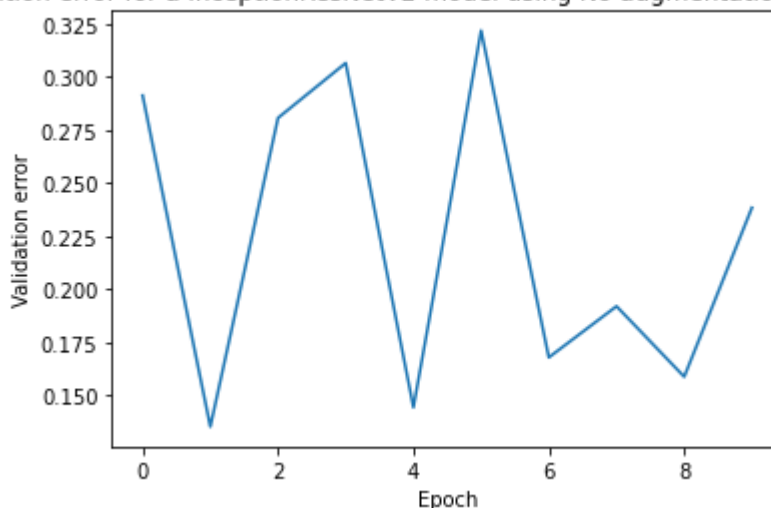
Validation Loss for a InceptionResNetV2 model using No augmentation with RMSprop



time: 194 ms (started: 2021-01-05 23:24:22 +00:00)

```
In [59]: simple_val_acc = H.history['val_accuracy']
plt.plot([1 - acc for acc in simple_val_acc])
plt.title('Validation error for a InceptionResNetV2 model using No augmentation with RM
plt.ylabel('Validation error')
plt.xlabel('Epoch')
plt.savefig('/content/drive/MyDrive/CV/Assignment 3/InceptionResNetV2/RMSprop_simple_Va
plt.show()
```

Validation error for a InceptionResNetV2 model using No augmentation with RMSprop



time: 218 ms (started: 2021-01-05 23:24:24 +00:00)

```
In [60]: print('loading test images')
X_test, y_test = load_data(pred_dir)
y_test = lb.fit_transform(y_test)
```

```
2%|          | 23/1128 [00:00<00:04, 228.51it/s]
loading test images
100%|██████████| 1128/1128 [00:03<00:00, 290.01it/s]
100%|██████████| 1297/1297 [00:04<00:00, 307.49it/s]
100%|██████████| 1330/1330 [00:03<00:00, 337.90it/s]
100%|██████████| 1166/1166 [00:03<00:00, 320.51it/s]
100%|██████████| 1144/1144 [00:03<00:00, 326.72it/s]
100%|██████████| 1236/1236 [00:03<00:00, 331.96it/s]
time: 24.6 s (started: 2021-01-05 23:24:24 +00:00)
```

```
In [61]: score = model.evaluate(X_test, y_test, batch_size=64)
print('Test Loss = ', score[0])
print('Test Accuracy = ', score[1])
```

```
115/115 [=====] - 5s 45ms/step - loss: 108.5760 - accuracy: 0.7583
Test Loss = 108.5760269165039
Test Accuracy = 0.7582523226737976
time: 5.84 s (started: 2021-01-05 23:24:49 +00:00)
```

```
In [62]: '''CONFUSION MATRIX'''
# Making prediction
y_pred = model.predict(X_test)
y_true = np.argmax(y_test, axis=-1)

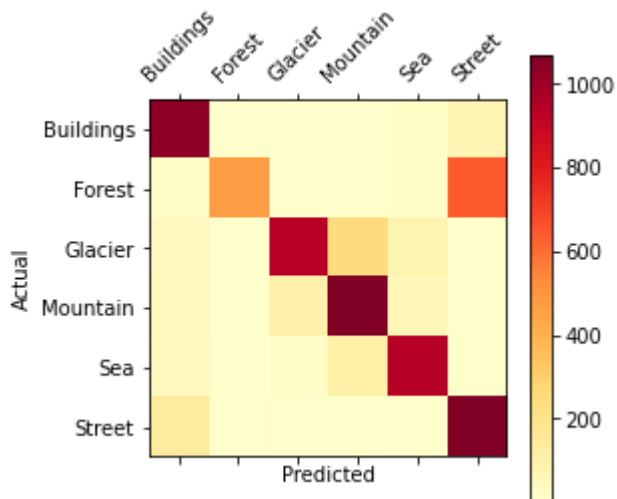
# Plotting the confusion matrix
from sklearn.metrics import confusion_matrix
confusion_mtx = confusion_matrix(y_true, np.argmax(y_pred, axis=1))
```

```
time: 9.48 s (started: 2021-01-05 23:24:54 +00:00)
```

```
In [63]: confusion_mtx
```

```
Out[63]: array([[1034,   3,   3,   4,  20,  80],
 [ 17, 480,   4,   4,  17, 644],
 [ 40,   2, 940, 249,  89,  10],
 [ 47,   5, 105, 1070,  61,   9],
 [ 37,   2,  22,  111, 949,   7],
 [143,   7,   4,   6,  13, 1063]])
time: 4.28 ms (started: 2021-01-05 23:25:04 +00:00)
```

```
In [64]: def plot_confusion_matrix(df_confusion, title='Confusion matrix', cmap=plt.cm.YlOrRd):
plt.matshow(df_confusion, cmap=cmap) # imshow
plt.colorbar()
tick_marks = np.arange(6)
names = ["Buildings", "Forest", "Glacier", "Mountain", "Sea", "Street"]
plt.xticks(tick_marks, names, rotation=45)
plt.yticks(tick_marks, names)
plt.ylabel("Actual")
plt.xlabel("Predicted")
#call function
plot_confusion_matrix(confusion_mtx)
```



```
time: 168 ms (started: 2021-01-05 23:25:04 +00:00)
```

```
In [65]: import seaborn as sns
```



```

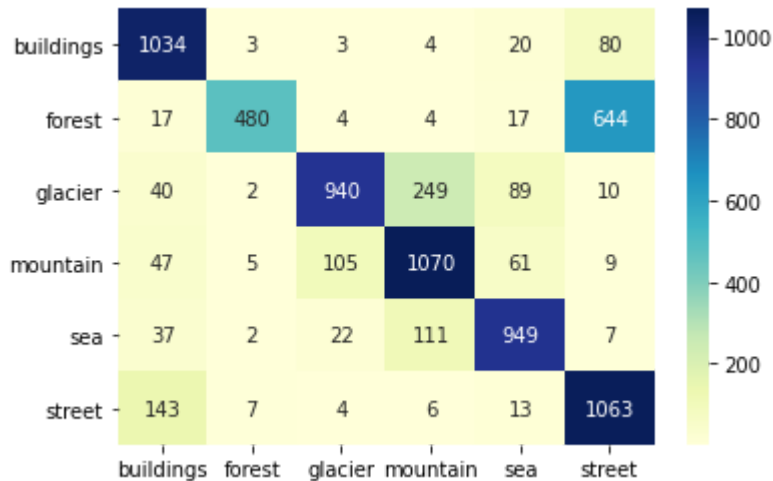
class_names = ['buildings', 'street', 'forest', 'glacier', 'mountain', 'sea']

class_names = sorted(class_names)

sns.heatmap(confusion_mtx, xticklabels=class_names, yticklabels=class_names,
            annot=True, fmt='d', cmap="YlGnBu")

```

Out[65]: <matplotlib.axes._subplots.AxesSubplot at 0x7fe04402b390>



time: 259 ms (started: 2021-01-05 23:25:04 +00:00)

Google Colab Link:

https://colab.research.google.com/drive/1u3_wNoe21S_GsBHiAYpYpCXQtW5f22SN?usp=sharing

```

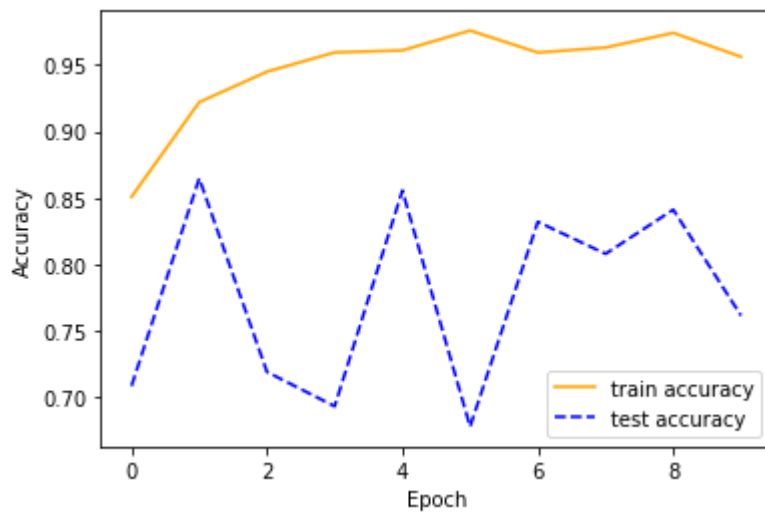
In [69]: fig = plt.figure()
# fig.patch.set_facecolor('white')

plt.plot(H.history['accuracy'],
         label='train accuracy',
         c='orange', ls='-')
plt.plot(H.history['val_accuracy'],
         label='test accuracy',
         c='blue', ls='--')

# plt.plot(With_Out_Aug.history['accuracy'],
#          label='train accuracy',
#          c='dodgerblue', ls='-')
# plt.plot(With_Out_Aug.history['val_accuracy'],
#          label='test accuracy',
#          c='dodgerblue', ls='--')

plt.xlabel('Epoch')
plt.ylabel('Accuracy')
plt.legend(loc='lower right')
plt.show()

```

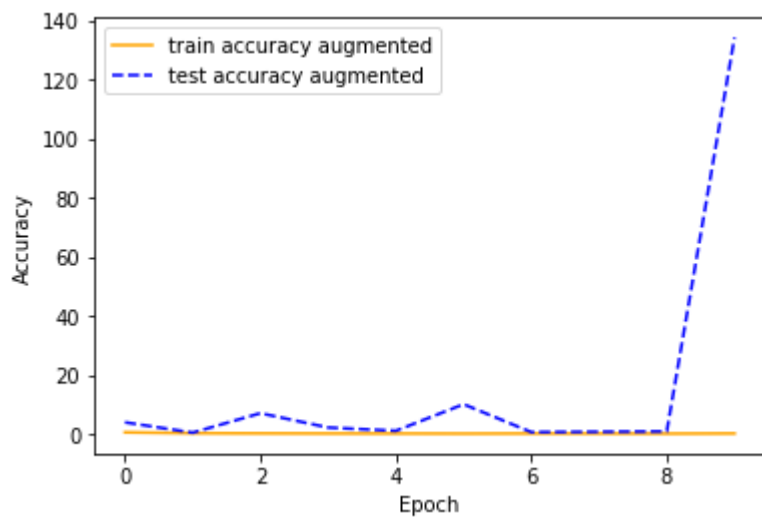


time: 135 ms (started: 2021-01-05 23:57:51 +00:00)

```
In [72]: fig = plt.figure()

plt.plot(H.history['loss'],
         label='train accuracy augmented',
         c='orange', ls='-')
plt.plot(H.history['val_loss'],
         label='test accuracy augmented',
         c='blue', ls='--')

plt.xlabel('Epoch')
plt.ylabel('Accuracy')
plt.legend(loc='upper left')
plt.show()
```



time: 133 ms (started: 2021-01-05 23:58:59 +00:00)

In []: