

Submission**✓ Ran successfully**

Submitted by NinaV 11 days ago

Public Score

0.515

In [1]:

```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python docker image: http
# :://github.com/kaggle/docker-python
# For example, here's several helpful packages to load in

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g.
pd.read_csv)

# Input data files are available in the "../input/" directory.
# For example, running this (by clicking run or pressing Shift+Enter) will list the files in the input directory

import os
print(os.listdir("../input"))

# Any results you write to the current directory are saved
as output.
```

```
['humpback-whale-identification', 'whales-cr
opped']
```

In [2]:

```
HW = 'humpback-whale-identification'
# TRAIN = '../input/humpback-whale-identification/train/'
TRAIN_CROPPED = "whales-cropped/cropped_train/cropped_train/"
TRAIN_CROPPED_IN = '../input/' + TRAIN_CROPPED

# TEST = '../input/humpback-whale-identification/test/'
TEST_CROPPED = "whales-cropped/cropped_test/cropped_tes
t/"
TEST_CROPPED_IN = '../input/' + TEST_CROPPED

LABELS = '../input/humpback-whale-identification/train.cs
v'
SAMPLE_SUB = '../input/humpback-whale-identification/samp
le_submission.csv'

train = pd.read_csv(LABELS)
print("With new_whale:")
train.head()
```

With new_whale:

Out[2]:

	Image	Id
0	0000e88ab.jpg	w_f48451c
1	0001f9222.jpg	w_c3d896a
2	00029d126.jpg	w_20df2c5
3	00050a15a.jpg	new_whale
4	0005c1ef8.jpg	new_whale

In [3]:

```
MODEL_F = 'Model_InceptionResNetV2_flow.h5'
WEIGHTS_F = 'Weights_InceptionResNetV2_flow.h5'
# MODEL = '../input/resnet50-pretrained/' + MODEL_F
# WEIGHTS = '../input/resnet50-pretrained/' + WEIGHTS_F
```

In [4]:

```
train.describe()
```

Out[4]:

	Image	Id
count	25361	25361
unique	25361	5005
top	4302b3d58.jpg	new_whale
freq	1	9664

In [5]:

```
import random
from IPython.display import Image
print("Example whale image")

#show sample image
name = random.choice(train['Image'])
print(name)
Image(filename = TRAIN_CROPPED_IN + name)
```

Example whale image
d97c81fab.jpg

Out[5]:



In [6]:

```
train_images = train.set_index('Image')
new_whale_train = train_images[train_images.Id == "new_whale"] # only new_whale dataset
# whales_train = train_images[~(train_images.Id == "new_whale")] # no new_whale dataset, used for training
criteria = train['Id'] != 'new_whale'
whales_train = train[criteria]

print("Without new_whale:")
whales_train.head()
```

Without new_whale:

Out[6]:

	Image	Id
0	0000e88ab.jpg	w_f48451c
1	0001f9222.jpg	w_c3d896a
2	00029d126.jpg	w_20df2c5

6	000a6daec.jpg	w_dd88965
8	0016b897a.jpg	w_64404ac

In [7]:

```
unique_labels = np.unique(whales_train.Id.values)
```

In [8]:

```
whales_train.describe()
```

Out[8]:

	Image	Id
count	15697	15697
unique	15697	5004
top	9c08c6cc5.jpg	w_23a388d
freq	1	73

In [9]:

```
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
from matplotlib.pyplot import imshow

from sklearn.preprocessing import LabelEncoder
from sklearn.preprocessing import OneHotEncoder

from keras import layers
from keras.preprocessing import image
from keras.preprocessing.image import ImageDataGenerator

# from keras.applications.imagenet_utils import preprocess_input
from keras.applications.inception_resnet_v2 import preprocess_input
from keras.applications.inception_resnet_v2 import InceptionResNetV2, preprocess_input

from keras.losses import binary_crossentropy

from keras.layers import Input, Dense, Activation, BatchNormalization, Flatten, Conv2D, GlobalAveragePooling2D
from keras.layers import AveragePooling2D, MaxPooling2D, Dropout
from keras.models import Model

import keras.backend as K
from keras.models import Sequential
from PIL import Image
import gc
import warnings
warnings.simplefilter("ignore", category=DeprecationWarning)

%matplotlib inline
```

Using TensorFlow backend.

In [10]:

```
IMAGE_HEIGHT = 128
IMAGE_WIDTH = 128
IMAGE_SHAPE = (IMAGE_HEIGHT, IMAGE_WIDTH, 3)

def prepareImages(data, m, dataset):
    print("Preparing images")
    X_train = np.zeros((m, IMAGE_HEIGHT, IMAGE_WIDTH, 3))
    count = 0

    for fig in data['Image']:
        filepath = "../input/" + dataset + "/" + fig
        img = image.load_img(filepath)
        img = img.convert(mode="RGB")

        #load images into images of required size
        img = img.resize((IMAGE_HEIGHT, IMAGE_WIDTH))
        x = image.img_to_array(img)
        x = preprocess_input(x)

        X_train[count] = x
        if (count%500 == 0):
            print("Processing image: ", count+1, ", ", fi
g)

        count += 1

    return X_train
```

In [11]:

```
def remove_new_whale():
    labels_dict = dict()
    labels_list = []

    for i in range(len(unique_labels)):
        labels_dict[unique_labels[i]] = i
        labels_list.append(unique_labels[i])

    print("Number of classes: {}".format(len(unique_label
s)))

    print(np.shape(labels_list))
    labels_list = np.array(labels_list)
    return labels_list, labels_dict
```

In [12]:

```
labels_list, labels_dict = remove_new_whale()
```

```
Number of classes: 5004
(5004,)
```

In [13]:

```
whales_train.Id = whales_train.Id.apply(lambda x: labels_
dict[x])
```

```
/opt/conda/lib/python3.6/site-packages/panda
s/core/generic.py:4405: SettingWithCopyWarni
ng:
A value is trying to be set on a copy of a s
lice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = va
```

lue instead

See the caveats in the documentation: <http://pandas.pydata.org/pandas-docs/stable/indexing.html#indexing-view-versus-copy>

```
self[name] = value
```

In [14]:

```
print(whales_train.head())
```

	Image	Id
0	0000e88ab.jpg	4785
1	0001f9222.jpg	3807
2	00029d126.jpg	661
6	000a6daec.jpg	4314
8	0016b897a.jpg	1928

In [15]:

```
def prepare_labels(y):
    values = np.array(y)
    label_encoder = LabelEncoder()
    integer_encoded = label_encoder.fit_transform(values)
    # print(integer_encoded)

    onehot_encoder = OneHotEncoder(sparse=False)
    integer_encoded = integer_encoded.reshape(len(integer_encoded), 1)
    # print(integer_encoded)
    onehot_encoded = onehot_encoder.fit_transform(integer_encoded)
    # print(onehot_encoded)

    y = onehot_encoded
    print(y.shape)
    return y, label_encoder
```

In [16]:

```
y, label_encoder = prepare_labels(whales_train['Id'])
y.shape
```

(15697, 5004)

```
/opt/conda/lib/python3.6/site-packages/sklearn/preprocessing/_encoders.py:368: FutureWarning: The handling of integer data will change in version 0.22. Currently, the categories are determined based on the range [0, max(values)], while in the future they will be determined based on the unique values.
If you want the future behaviour and silence this warning, you can specify "categories='auto'".
In case you used a LabelEncoder before this OneHotEncoder to convert the categories to integers, then you can now use the OneHotEncoder directly.

warnings.warn(msg, FutureWarning)
```

Out[16]:

(15697, 5004)

In [17]:

```
%matplotlib inline
X = prepareImages(whales_train, whales_train.shape[0], TRAIN_CROPPED)
X /= 255
```

```
Preparing images
Processing image: 1 , 0000e88ab.jpg
Processing image: 501 , 0823f9df3.jpg
Processing image: 1001 , 10b694367.jpg
Processing image: 1501 , 195805c52.jpg
Processing image: 2001 , 21e28ae02.jpg
Processing image: 2501 , 2a1146baa.jpg
Processing image: 3001 , 32533a7fb.jpg
Processing image: 3501 , 3a8173905.jpg
Processing image: 4001 , 42f134dea.jpg
Processing image: 4501 , 4aa4de13a.jpg
Processing image: 5001 , 5297b6c40.jpg
Processing image: 5501 , 5b7f0e6e6.jpg
Processing image: 6001 , 6311688b7.jpg
Processing image: 6501 , 6b29760e3.jpg
Processing image: 7001 , 7390cbfab.jpg
Processing image: 7501 , 7b949f512.jpg
Processing image: 8001 , 83336c385.jpg
Processing image: 8501 , 8b369569b.jpg
Processing image: 9001 , 92f450203.jpg
Processing image: 9501 , 9b984102a.jpg
Processing image: 10001 , a39babcc55.jpg
Processing image: 10501 , ab6f8bdddd.jpg
Processing image: 11001 , b36da6f7c.jpg
Processing image: 11501 , bb9ffa8b2.jpg
Processing image: 12001 , c4160ee65.jpg
Processing image: 12501 , cb7153d51.jpg
Processing image: 13001 , d3b15e280.jpg
Processing image: 13501 , dbb2088f4.jpg
Processing image: 14001 , e3fe27a84.jpg
Processing image: 14501 , ebde74948.jpg
Processing image: 15001 , f3f3f8b92.jpg
Processing image: 15501 , fc54db327.jpg
```

In [18]:

```
CLASSES = 5004
EPOCHS = 30
BATCH_SIZE = 100

# setup model
base_model = InceptionResNetV2(weights='imagenet', include_top=False, input_shape = IMAGE_SHAPE)

x = base_model.output
x = GlobalAveragePooling2D(name='avg_pool')(x)
x = Dropout(0.4)(x)
predictions = Dense(CLASSES, activation='softmax')(x)
model = Model(inputs=base_model.input, outputs=predictions)

# transfer learning
for layer in base_model.layers:
    layer.trainable = True

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

```
model.summary()
```

```
Downloading data from https://github.com/fchollet/deep-learning-models/releases/download/v0.7/inception_resnet_v2_weights_tf_dim_ordering_tf_kernels_notop.h5
219062272/219055592 [=====] - 2s 0us/step
-----
-----
-----  
Layer (type)          Output Shape  
Param #    Connected to  
-----  
-----  
-----  
input_1 (InputLayer)      (None, 128,  
128, 3)  0  
-----  
-----  
conv2d_1 (Conv2D)        (None, 63, 6  
3, 32)   864           input_1[0][0]  
-----  
-----  
batch_normalization_1 (BatchNor (None, 63, 6  
3, 32)   96            conv2d_1[0][0]  
-----  
-----  
activation_1 (Activation) (None, 63, 6  
3, 32)   0              batch_normalization_1  
[0][0]  
-----  
-----  
conv2d_2 (Conv2D)        (None, 61, 6  
1, 32)   9216          activation_1[0][0]  
-----  
-----  
batch_normalization_2 (BatchNor (None, 61, 6  
1, 32)   96            conv2d_2[0][0]  
-----  
-----  
activation_2 (Activation) (None, 61, 6  
1, 32)   0              batch_normalization_2  
[0][0]  
-----  
-----  
conv2d_3 (Conv2D)        (None, 61, 6  
1, 64)   18432         activation_2[0][0]  
-----
```

```
-----  
batch_normalization_3 (BatchNor (None, 61, 6  
1, 64) 192 conv2d_3[0][0]  
  
-----  
activation_3 (Activation) (None, 61, 6  
1, 64) 0 batch_normalization_3  
[0][0]  
  
-----  
max_pooling2d_1 (MaxPooling2D) (None, 30, 3  
0, 64) 0 activation_3[0][0]  
  
-----  
conv2d_4 (Conv2D) (None, 30, 3  
0, 80) 5120 max_pooling2d_1[0][0]  
  
-----  
batch_normalization_4 (BatchNor (None, 30, 3  
0, 80) 240 conv2d_4[0][0]  
  
-----  
activation_4 (Activation) (None, 30, 3  
0, 80) 0 batch_normalization_4  
[0][0]  
  
-----  
conv2d_5 (Conv2D) (None, 28, 2  
8, 192) 138240 activation_4[0][0]  
  
-----  
batch_normalization_5 (BatchNor (None, 28, 2  
8, 192) 576 conv2d_5[0][0]  
  
-----  
activation_5 (Activation) (None, 28, 2  
8, 192) 0 batch_normalization_5  
[0][0]  
  
-----  
max_pooling2d_2 (MaxPooling2D) (None, 13, 1  
3, 192) 0 activation_5[0][0]  
  
-----  
conv2d_9 (Conv2D) (None, 13, 1  
3, 64) 12288 max_pooling2d_2[0][0]  
  
-----
```

```
batch_normalization_9 (BatchNor (None, 13, 1  
3, 64) 192           conv2d_9[0][0]  
  
-----  
-----  
activation_9 (Activation)      (None, 13, 1  
3, 64) 0           batch_normalization_9  
[0][0]  
  
-----  
-----  
conv2d_7 (Conv2D)            (None, 13, 1  
3, 48) 9216         max_pooling2d_2[0][0]  
  
-----  
-----  
conv2d_10 (Conv2D)           (None, 13, 1  
3, 96) 55296        activation_9[0][0]  
  
-----  
-----  
batch_normalization_7 (BatchNor (None, 13, 1  
3, 48) 144           conv2d_7[0][0]  
  
-----  
-----  
batch_normalization_10 (BatchNo (None, 13, 1  
3, 96) 288           conv2d_10[0][0]  
  
-----  
-----  
activation_7 (Activation)    (None, 13, 1  
3, 48) 0           batch_normalization_7  
[0][0]  
  
-----  
-----  
activation_10 (Activation)   (None, 13, 1  
3, 96) 0           batch_normalization_10  
[0][0]  
  
-----  
-----  
average_pooling2d_1 (AveragePoo (None, 13, 1  
3, 192) 0           max_pooling2d_2[0][0]  
  
-----  
-----  
conv2d_6 (Conv2D)           (None, 13, 1  
3, 96) 18432        max_pooling2d_2[0][0]  
  
-----  
-----  
conv2d_8 (Conv2D)           (None, 13, 1  
3, 64) 76800        activation_7[0][0]
```

```
conv2d_11 (Conv2D)           (None, 13, 1  
3, 96) 82944      activation_10[0][0]  
-----  
-----  
conv2d_12 (Conv2D)           (None, 13, 1  
3, 64) 12288      average_pooling2d_1[0]  
[0]  
-----  
-----  
batch_normalization_6 (BatchNor (None, 13, 1  
3, 96) 288      conv2d_6[0][0]  
-----  
-----  
batch_normalization_8 (BatchNor (None, 13, 1  
3, 64) 192      conv2d_8[0][0]  
-----  
-----  
batch_normalization_11 (BatchNo (None, 13, 1  
3, 96) 288      conv2d_11[0][0]  
-----  
-----  
batch_normalization_12 (BatchNo (None, 13, 1  
3, 64) 192      conv2d_12[0][0]  
-----  
-----  
activation_6 (Activation)    (None, 13, 1  
3, 96) 0          batch_normalization_6  
[0][0]  
-----  
-----  
activation_8 (Activation)    (None, 13, 1  
3, 64) 0          batch_normalization_8  
[0][0]  
-----  
-----  
activation_11 (Activation)   (None, 13, 1  
3, 96) 0          batch_normalization_11  
[0][0]  
-----  
-----  
activation_12 (Activation)   (None, 13, 1  
3, 64) 0          batch_normalization_12  
[0][0]  
-----  
-----  
mixed_5b (Concatenate)      (None, 13, 1  
3, 320) 0          activation_6[0][0]  
-----  
-----  
activation_8[0][0]
```

```
activation_11[0][0]

activation_12[0][0]

-----
-----  
conv2d_16 (Conv2D)           (None, 13, 1  
3, 32) 10240      mixed_5b[0][0]  
-----  
-----  
batch_normalization_16 (BatchNo (None, 13, 1  
3, 32) 96          conv2d_16[0][0]  
-----  
-----  
activation_16 (Activation)   (None, 13, 1  
3, 32) 0            batch_normalization_16  
[0][0]  
-----  
-----  
conv2d_14 (Conv2D)           (None, 13, 1  
3, 32) 10240      mixed_5b[0][0]  
-----  
-----  
conv2d_17 (Conv2D)           (None, 13, 1  
3, 48) 13824       activation_16[0][0]  
-----  
-----  
batch_normalization_14 (BatchNo (None, 13, 1  
3, 32) 96          conv2d_14[0][0]  
-----  
-----  
batch_normalization_17 (BatchNo (None, 13, 1  
3, 48) 144         conv2d_17[0][0]  
-----  
-----  
activation_14 (Activation)   (None, 13, 1  
3, 32) 0            batch_normalization_14  
[0][0]  
-----  
-----  
activation_17 (Activation)   (None, 13, 1  
3, 48) 0            batch_normalization_17  
[0][0]  
-----  
-----  
conv2d_13 (Conv2D)           (None, 13, 1  
3, 32) 10240      mixed_5b[0][0]  
-----
```

```
-----  
-----  
conv2d_15 (Conv2D)           (None, 13, 1  
3, 32)    9216      activation_14[0][0]  
-----  
-----  
conv2d_18 (Conv2D)           (None, 13, 1  
3, 64)    27648      activation_17[0][0]  
-----  
-----  
batch_normalization_13 (BatchNo (None, 13, 1  
3, 32)    96      conv2d_13[0][0]  
-----  
-----  
batch_normalization_15 (BatchNo (None, 13, 1  
3, 32)    96      conv2d_15[0][0]  
-----  
-----  
batch_normalization_18 (BatchNo (None, 13, 1  
3, 64)    192      conv2d_18[0][0]  
-----  
-----  
activation_13 (Activation)   (None, 13, 1  
3, 32)    0      batch_normalization_13  
[0][0]  
-----  
-----  
activation_15 (Activation)   (None, 13, 1  
3, 32)    0      batch_normalization_15  
[0][0]  
-----  
-----  
activation_18 (Activation)   (None, 13, 1  
3, 64)    0      batch_normalization_18  
[0][0]  
-----  
-----  
block35_1_mixed (Concatenate) (None, 13, 1  
3, 128)   0      activation_13[0][0]  
-----  
-----  
activation_15[0][0]  
-----  
-----  
activation_18[0][0]  
-----  
-----  
block35_1_conv (Conv2D)       (None, 13, 1  
3, 320)   41280     block35_1_mixed[0][0]  
-----
```

block35_1 (Lambda) (None, 13, 1
3, 320) 0 mixed_5b[0][0]

block35_1_conv[0][0]

```
block35_1_ac (Activation)      (None, 13, 1  
3, 320) 0          block35_1[0][0]
```

conv2d_22 (Conv2D) (None, 13, 1
3, 32) 10240 block35_1_ac[0][0]

```
batch_normalization_22 (BatchNo (None, 13, 1  
3, 32) 96 conv2d_22[0][0]
```

```
activation_22 (Activation)      (None, 13, 1  
3, 32)    0          batch_normalization_22  
[0][0]
```

conv2d_20 (Conv2D) (None, 13, 1
3, 32) 10240 block35_1_ac[0][0]

conv2d_23 (Conv2D) (None, 13, 1
3, 48) 13824 activation_22[0][0]

```
batch_normalization_20 (BatchNorm (None, 13, 1  
3, 32) 96 conv2d_20[0][0]
```

batch_normalization_23 (BatchNo (None, 13, 1
3, 48) 144 conv2d_23[0][0]

```
activation_20 (Activation)      (None, 13, 1  
3, 32)    0          batch_normalization_20  
[0][0]
```

```
activation_23 (Activation)      (None, 13, 1  
3, 48)  0          batch normalization 23
```

```
[0][0]
-----
-----
conv2d_19 (Conv2D)           (None, 13, 1
3, 32) 10240      block35_1_ac[0][0]
-----
-----
conv2d_21 (Conv2D)           (None, 13, 1
3, 32) 9216       activation_20[0][0]
-----
-----
conv2d_24 (Conv2D)           (None, 13, 1
3, 64) 27648      activation_23[0][0]
-----
-----
batch_normalization_19 (BatchNo (None, 13, 1
3, 32) 96          conv2d_19[0][0]
-----
-----
batch_normalization_21 (BatchNo (None, 13, 1
3, 32) 96          conv2d_21[0][0]
-----
-----
batch_normalization_24 (BatchNo (None, 13, 1
3, 64) 192         conv2d_24[0][0]
-----
-----
activation_19 (Activation)   (None, 13, 1
3, 32) 0            batch_normalization_19
[0][0]
-----
-----
activation_21 (Activation)   (None, 13, 1
3, 32) 0            batch_normalization_21
[0][0]
-----
-----
activation_24 (Activation)   (None, 13, 1
3, 64) 0            batch_normalization_24
[0][0]
-----
-----
block35_2_mixed (Concatenate) (None, 13, 1
3, 128) 0           activation_19[0][0]
                               activation_21[0][0]
                               activation_24[0][0]
```

```
block35_2_conv (Conv2D)           (None, 13, 1  
3, 320) 41280      block35_2_mixed[0][0]
```

block35_2 (Lambda) (None, 13, 1
3, 320) 0 block35_1_ac[0][0]

block35_2_conv[0][0]

block35_2_ac (Activation) (None, 13, 1
3, 320) 0 block35_2[0][0]

conv2d_28 (Conv2D) (None, 13, 1
3, 32) 10240 block35_2_ac[0][0]

```
batch_normalization_28 (BatchNo (None, 13, 1  
3, 32) 96 conv2d_28[0][0]
```

```
activation_28 (Activation)      (None, 13, 1  
3, 32)  0          batch_normalization_28  
[0][0]
```

conv2d_26 (Conv2D) (None, 13, 1
3, 32) 10240 block35_2_ac[0][0]

conv2d_29 (Conv2D) (None, 13, 13, 48) 13824 activation_28[0][0]

```
batch_normalization_26 (BatchNo (None, 13, 13, 32) 96 conv2d_26[0][0]
```

batch_normalization_29 (BatchNo (None, 13, 13, 48) 144 conv2d_29[0][0]

```
-----  
activation_26 (Activation)      (None, 13, 1  
3, 32)  0           batch_normalization_26  
[0][0]  
-----  
-----  
activation_29 (Activation)      (None, 13, 1  
3, 48)  0           batch_normalization_29  
[0][0]  
-----  
-----  
conv2d_25 (Conv2D)            (None, 13, 1  
3, 32)  10240       block35_2_ac[0][0]  
-----  
-----  
conv2d_27 (Conv2D)            (None, 13, 1  
3, 32)  9216        activation_26[0][0]  
-----  
-----  
conv2d_30 (Conv2D)            (None, 13, 1  
3, 64)  27648       activation_29[0][0]  
-----  
-----  
batch_normalization_25 (BatchNo (None, 13, 1  
3, 32)  96          conv2d_25[0][0]  
-----  
-----  
batch_normalization_27 (BatchNo (None, 13, 1  
3, 32)  96          conv2d_27[0][0]  
-----  
-----  
batch_normalization_30 (BatchNo (None, 13, 1  
3, 64)  192         conv2d_30[0][0]  
-----  
-----  
activation_25 (Activation)    (None, 13, 1  
3, 32)  0           batch_normalization_25  
[0][0]  
-----  
-----  
activation_27 (Activation)    (None, 13, 1  
3, 32)  0           batch_normalization_27  
[0][0]  
-----  
-----  
activation_30 (Activation)    (None, 13, 1  
3, 64)  0           batch_normalization_30  
[0][0]
```

```
block35_3_mixed (Concatenate)      (None, 13, 1
3, 128)  0                      activation_25[0][0]

activation_27[0][0]

activation_30[0][0]

-----
-----
-----
block35_3_conv (Conv2D)          (None, 13, 1
3, 320)  41280                 block35_3_mixed[0][0]

-----
-----
-----
block35_3 (Lambda)              (None, 13, 1
3, 320)  0                      block35_2_ac[0][0]

block35_3_conv[0][0]

-----
-----
-----
block35_3_ac (Activation)       (None, 13, 1
3, 320)  0                      block35_3[0][0]

-----
-----
-----
conv2d_34 (Conv2D)              (None, 13, 1
3, 32)   10240                 block35_3_ac[0][0]

-----
-----
-----
batch_normalization_34 (BatchNo (None, 13, 1
3, 32)   96                     conv2d_34[0][0]

-----
-----
-----
activation_34 (Activation)     (None, 13, 1
3, 32)   0                      batch_normalization_34
[0][0]

-----
-----
-----
conv2d_32 (Conv2D)              (None, 13, 1
3, 32)   10240                 block35_3_ac[0][0]

-----
-----
-----
conv2d_35 (Conv2D)              (None, 13, 1
3, 48)    13824                 activation_34[0][0]

-----
-----
-----
batch_normalization_32 (BatchNo (None, 13, 1
3, 32)   96                     conv2d_32[0][0]
```

batch_normalization_35 (BatchNo (None, 13, 1
3, 48) 144 conv2d_35[0][0]

activation_32 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_32
[0][0]

activation_35 (Activation) (None, 13, 1
3, 48) 0 batch_normalization_35
[0][0]

conv2d_31 (Conv2D) (None, 13, 1
3, 32) 10240 block35_3_ac[0][0]

conv2d_33 (Conv2D) (None, 13, 1
3, 32) 9216 activation_32[0][0]

conv2d_36 (Conv2D) (None, 13, 1
3, 64) 27648 activation_35[0][0]

batch_normalization_31 (BatchNo (None, 13, 1
3, 32) 96 conv2d_31[0][0]

batch_normalization_33 (BatchNo (None, 13, 1
3, 32) 96 conv2d_33[0][0]

batch_normalization_36 (BatchNo (None, 13, 1
3, 64) 192 conv2d_36[0][0]

activation_31 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_31
[0][0]

activation_33 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_33
[0][0]

```
-----  
activation_36 (Activation)      (None, 13, 1  
3, 64)  0           batch_normalization_36  
[0][0]  
-----  
-----  
block35_4_mixed (Concatenate)  (None, 13, 1  
3, 128)  0           activation_31[0][0]  
-----  
activation_33[0][0]  
-----  
activation_36[0][0]  
-----  
-----  
block35_4_conv (Conv2D)        (None, 13, 1  
3, 320)  41280       block35_4_mixed[0][0]  
-----  
-----  
block35_4 (Lambda)            (None, 13, 1  
3, 320)  0           block35_3_ac[0][0]  
-----  
block35_4_conv[0][0]  
-----  
-----  
block35_4_ac (Activation)     (None, 13, 1  
3, 320)  0           block35_4[0][0]  
-----  
-----  
conv2d_40 (Conv2D)           (None, 13, 1  
3, 32)   10240       block35_4_ac[0][0]  
-----  
-----  
batch_normalization_40 (BatchNo (None, 13, 1  
3, 32)   96          conv2d_40[0][0]  
-----  
-----  
activation_40 (Activation)    (None, 13, 1  
3, 32)   0           batch_normalization_40  
[0][0]  
-----  
-----  
conv2d_38 (Conv2D)           (None, 13, 1  
3, 32)   10240       block35_4_ac[0][0]  
-----  
-----  
conv2d_41 (Conv2D)           (None, 13, 1
```

3, 48) 13824 activation_40[0][0]

batch_normalization_38 (BatchNo (None, 13, 1
3, 32) 96 conv2d_38[0][0]

batch_normalization_41 (BatchNo (None, 13, 1
3, 48) 144 conv2d_41[0][0]

activation_38 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_38
[0][0]

activation_41 (Activation) (None, 13, 1
3, 48) 0 batch_normalization_41
[0][0]

conv2d_37 (Conv2D) (None, 13, 1
3, 32) 10240 block35_4_ac[0][0]

conv2d_39 (Conv2D) (None, 13, 1
3, 32) 9216 activation_38[0][0]

conv2d_42 (Conv2D) (None, 13, 1
3, 64) 27648 activation_41[0][0]

batch_normalization_37 (BatchNo (None, 13, 1
3, 32) 96 conv2d_37[0][0]

batch_normalization_39 (BatchNo (None, 13, 1
3, 32) 96 conv2d_39[0][0]

batch_normalization_42 (BatchNo (None, 13, 1
3, 64) 192 conv2d_42[0][0]

activation_37 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_37

```
      3, 32)    0           batch_normalization_37
[0][0]

-----
-----  

activation_39 (Activation)      (None, 13, 1
3, 32)    0           batch_normalization_39
[0][0]

-----
-----  

activation_42 (Activation)      (None, 13, 1
3, 64)    0           batch_normalization_42
[0][0]

-----
-----  

block35_5_mixed (Concatenate)  (None, 13, 1
3, 128)   0           activation_37[0][0]

activation_39[0][0]

activation_42[0][0]

-----
-----  

block35_5_conv (Conv2D)        (None, 13, 1
3, 320)   41280         block35_5_mixed[0][0]

-----
-----  

block35_5 (Lambda)            (None, 13, 1
3, 320)   0           block35_4_ac[0][0]

block35_5_conv[0][0]

-----
-----  

block35_5_ac (Activation)     (None, 13, 1
3, 320)   0           block35_5[0][0]

-----
-----  

conv2d_46 (Conv2D)            (None, 13, 1
3, 32)    10240         block35_5_ac[0][0]

-----
-----  

batch_normalization_46 (BatchNo (None, 13, 1
3, 32)    96           conv2d_46[0][0]

-----
-----  

activation_46 (Activation)    (None, 13, 1
3, 32)    0           batch_normalization_46
[0][0]
```

```
-----  
conv2d_44 (Conv2D)           (None, 13, 1  
3, 32)    10240      block35_5_ac[0][0]  
  
-----  
conv2d_47 (Conv2D)           (None, 13, 1  
3, 48)     13824      activation_46[0][0]  
  
-----  
batch_normalization_44 (BatchNo (None, 13, 1  
3, 32)    96          conv2d_44[0][0]  
  
-----  
batch_normalization_47 (BatchNo (None, 13, 1  
3, 48)    144         conv2d_47[0][0]  
  
-----  
activation_44 (Activation)   (None, 13, 1  
3, 32)    0           batch_normalization_44  
[0][0]  
  
-----  
activation_47 (Activation)   (None, 13, 1  
3, 48)    0           batch_normalization_47  
[0][0]  
  
-----  
conv2d_43 (Conv2D)           (None, 13, 1  
3, 32)    10240      block35_5_ac[0][0]  
  
-----  
conv2d_45 (Conv2D)           (None, 13, 1  
3, 32)    9216       activation_44[0][0]  
  
-----  
conv2d_48 (Conv2D)           (None, 13, 1  
3, 64)     27648      activation_47[0][0]  
  
-----  
batch_normalization_43 (BatchNo (None, 13, 1  
3, 32)    96          conv2d_43[0][0]  
  
-----  
batch_normalization_45 (BatchNo (None, 13, 1  
3, 32)    96          conv2d_45[0][0]
```

```
-----  
batch_normalization_48 (BatchNo (None, 13, 1  
3, 64) 192           conv2d_48[0][0]  
  
-----  
activation_43 (Activation)      (None, 13, 1  
3, 32) 0                 batch_normalization_43  
[0][0]  
  
-----  
activation_45 (Activation)      (None, 13, 1  
3, 32) 0                 batch_normalization_45  
[0][0]  
  
-----  
activation_48 (Activation)      (None, 13, 1  
3, 64) 0                 batch_normalization_48  
[0][0]  
  
-----  
block35_6_mixed (Concatenate)  (None, 13, 1  
3, 128) 0                activation_43[0][0]  
  
                               activation_45[0][0]  
  
                               activation_48[0][0]  
  
-----  
block35_6_conv (Conv2D)        (None, 13, 1  
3, 320) 41280            block35_6_mixed[0][0]  
  
-----  
block35_6 (Lambda)            (None, 13, 1  
3, 320) 0                block35_5_ac[0][0]  
  
                               block35_6_conv[0][0]  
  
-----  
block35_6_ac (Activation)    (None, 13, 1  
3, 320) 0                block35_6[0][0]  
  
-----  
conv2d_52 (Conv2D)           (None, 13, 1  
3, 32) 10240             block35_6_ac[0][0]  
  
-----  
batch_normalization_52 (BatchNo (None, 13, 1  
3, 32) 96                conv2d_52[0][0]
```

```
-----  
activation_52 (Activation)      (None, 13, 1  
3, 32)  0           batch_normalization_52  
[0][0]  
-----  
conv2d_50 (Conv2D)            (None, 13, 1  
3, 32)  10240       block35_6_ac[0][0]  
-----  
conv2d_53 (Conv2D)            (None, 13, 1  
3, 48)   13824       activation_52[0][0]  
-----  
batch_normalization_50 (BatchNo (None, 13, 1  
3, 32)  96          conv2d_50[0][0]  
-----  
batch_normalization_53 (BatchNo (None, 13, 1  
3, 48)  144          conv2d_53[0][0]  
-----  
activation_50 (Activation)    (None, 13, 1  
3, 32)  0           batch_normalization_50  
[0][0]  
-----  
activation_53 (Activation)    (None, 13, 1  
3, 48)  0           batch_normalization_53  
[0][0]  
-----  
conv2d_49 (Conv2D)            (None, 13, 1  
3, 32)  10240       block35_6_ac[0][0]  
-----  
conv2d_51 (Conv2D)            (None, 13, 1  
3, 32)  9216        activation_50[0][0]  
-----  
conv2d_54 (Conv2D)            (None, 13, 1  
3, 64)   27648       activation_53[0][0]  
-----  
batch_normalization_49 (BatchNo (None, 13, 1  
3, 32)  96          conv2d_49[0][0]
```


batch_normalization_51 (BatchNo (None, 13, 1
3, 32) 96 conv2d_51[0][0]

batch_normalization_54 (BatchNo (None, 13, 1
3, 64) 192 conv2d_54[0][0]

activation_49 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_49
[0][0]

activation_51 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_51
[0][0]

activation_54 (Activation) (None, 13, 1
3, 64) 0 batch_normalization_54
[0][0]

block35_7_mixed (Concatenate) (None, 13, 1
3, 128) 0 activation_49[0][0]

activation_51[0][0]

activation_54[0][0]

block35_7_conv (Conv2D) (None, 13, 1
3, 320) 41280 block35_7_mixed[0][0]

block35_7 (Lambda) (None, 13, 1
3, 320) 0 block35_6_ac[0][0]

block35_7_conv[0][0]

block35_7_ac (Activation) (None, 13, 1
3, 320) 0 block35_7[0][0]

copy2d_58 (Copy2D) (None, 13, 1

```
conv2d_58 (Conv2D)           (None, 13, 1
3, 32)    10240      block35_7_ac[0][0]

-----
-----  
batch_normalization_58 (BatchNo (None, 13, 1
3, 32)    96      conv2d_58[0][0]

-----
-----  
activation_58 (Activation)   (None, 13, 1
3, 32)    0      batch_normalization_58
[0][0]

-----
-----  
conv2d_56 (Conv2D)           (None, 13, 1
3, 32)    10240      block35_7_ac[0][0]

-----
-----  
conv2d_59 (Conv2D)           (None, 13, 1
3, 48)    13824      activation_58[0][0]

-----
-----  
batch_normalization_56 (BatchNo (None, 13, 1
3, 32)    96      conv2d_56[0][0]

-----
-----  
batch_normalization_59 (BatchNo (None, 13, 1
3, 48)    144      conv2d_59[0][0]

-----
-----  
activation_56 (Activation)   (None, 13, 1
3, 32)    0      batch_normalization_56
[0][0]

-----
-----  
activation_59 (Activation)   (None, 13, 1
3, 48)    0      batch_normalization_59
[0][0]

-----
-----  
conv2d_55 (Conv2D)           (None, 13, 1
3, 32)    10240      block35_7_ac[0][0]

-----
-----  
conv2d_57 (Conv2D)           (None, 13, 1
3, 32)    9216      activation_56[0][0]

-----
-----  
conv2d_60 (Conv2D)           (None, 13, 1
```

3, 64) 27648 activation_59[0][0]

batch_normalization_55 (BatchNo (None, 13, 1
3, 32) 96 conv2d_55[0][0]

batch_normalization_57 (BatchNo (None, 13, 1
3, 32) 96 conv2d_57[0][0]

batch_normalization_60 (BatchNo (None, 13, 1
3, 64) 192 conv2d_60[0][0]

activation_55 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_55
[0][0]

activation_57 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_57
[0][0]

activation_60 (Activation) (None, 13, 1
3, 64) 0 batch_normalization_60
[0][0]

block35_8_mixed (Concatenate) (None, 13, 1
3, 128) 0 activation_55[0][0]

activation_57[0][0]

activation_60[0][0]

block35_8_conv (Conv2D) (None, 13, 1
3, 320) 41280 block35_8_mixed[0][0]

block35_8 (Lambda) (None, 13, 1
3, 320) 0 block35_7_ac[0][0]

block35_8_conv[0][0]

block35_8_ac (Activation) (None, 13, 1
3, 320) e block35_8[e][e]

conv2d_64 (Conv2D) (None, 13, 1
3, 32) 10240 block35_8_ac[0][0]

```
batch_normalization_64 (BatchNorm (None, 13, 1  
3, 32) 96 conv2d_64[0][0]
```

```
activation_64 (Activation)      (None, 13, 1  
3, 32)    0          batch_normalization_64  
[0][0]
```

conv2d_62 (Conv2D) (None, 13, 1
3, 32) 10240 block35_8_ac[0][0]

conv2d_65 (Conv2D) (None, 13, 1
3, 48) 13824 activation_64[0][0]

```
batch_normalization_62 (BatchNo (None, 13, 1  
3, 32) 96 conv2d_62[0][0]
```

```
batch_normalization_65 (BatchNo (None, 13, 1  
3, 48) 144 conv2d_65[0][0]
```

```
activation_62 (Activation)      (None, 13, 1  
3, 32)    0          batch_normalization_62  
[0][0]
```

```
activation_65 (Activation)      (None, 13, 1  
3, 48)    0          batch_normalization_65  
[0][0]
```

conv2d_61 (Conv2D) (None, 13, 1
3, 32) 10240 block35_8_ac[0][0]

```
-----  
conv2d_63 (Conv2D)           (None, 13, 1  
3, 32)    9216      activation_62[0][0]  
  
-----  
conv2d_66 (Conv2D)           (None, 13, 1  
3, 64)    27648      activation_65[0][0]  
  
-----  
batch_normalization_61 (BatchNo (None, 13, 1  
3, 32)    96       conv2d_61[0][0]  
  
-----  
batch_normalization_63 (BatchNo (None, 13, 1  
3, 32)    96       conv2d_63[0][0]  
  
-----  
batch_normalization_66 (BatchNo (None, 13, 1  
3, 64)    192      conv2d_66[0][0]  
  
-----  
activation_61 (Activation)   (None, 13, 1  
3, 32)    0        batch_normalization_61  
[0][0]  
  
-----  
activation_63 (Activation)   (None, 13, 1  
3, 32)    0        batch_normalization_63  
[0][0]  
  
-----  
activation_66 (Activation)   (None, 13, 1  
3, 64)    0        batch_normalization_66  
[0][0]  
  
-----  
block35_9_mixed (Concatenate) (None, 13, 1  
3, 128)   0        activation_61[0][0]  
  
                               activation_63[0][0]  
  
                               activation_66[0][0]  
  
-----  
block35_9_conv (Conv2D)      (None, 13, 1  
3, 320)   41280     block35_9_mixed[0][0]  
  
-----
```

```
-----  
block35_9 (Lambda)          (None, 13, 1  
3, 320)  0                  block35_8_ac[0][0]  
  
-----  
-----  
-----  
block35_9_ac (Activation)    (None, 13, 1  
3, 320)  0                  block35_9[0][0]  
  
-----  
-----  
-----  
conv2d_70 (Conv2D)          (None, 13, 1  
3, 32)   10240             block35_9_ac[0][0]  
  
-----  
-----  
-----  
batch_normalization_70 (BatchNo (None, 13, 1  
3, 32)   96                conv2d_70[0][0]  
  
-----  
-----  
-----  
activation_70 (Activation)   (None, 13, 1  
3, 32)   0                  batch_normalization_70  
[0][0]  
  
-----  
-----  
-----  
conv2d_68 (Conv2D)          (None, 13, 1  
3, 32)   10240             block35_9_ac[0][0]  
  
-----  
-----  
-----  
conv2d_71 (Conv2D)          (None, 13, 1  
3, 48)    13824            activation_70[0][0]  
  
-----  
-----  
-----  
batch_normalization_68 (BatchNo (None, 13, 1  
3, 32)   96                conv2d_68[0][0]  
  
-----  
-----  
-----  
batch_normalization_71 (BatchNo (None, 13, 1  
3, 48)   144               conv2d_71[0][0]  
  
-----  
-----  
-----  
activation_68 (Activation)   (None, 13, 1  
3, 32)   0                  batch_normalization_68  
[0][0]  
  
-----  
-----  
-----  
activation_71 (Activation)   (None, 13, 1  
3, 48)   0                  batch_normalization_71  
[0][0]
```

[0][0]

conv2d_67 (Conv2D) (None, 13, 1
3, 32) 10240 block35_9_ac[0][0]

conv2d_69 (Conv2D) (None, 13, 1
3, 32) 9216 activation_68[0][0]

conv2d_72 (Conv2D) (None, 13, 1
3, 64) 27648 activation_71[0][0]

batch_normalization_67 (BatchNo (None, 13, 1
3, 32) 96 conv2d_67[0][0]

batch_normalization_69 (BatchNo (None, 13, 1
3, 32) 96 conv2d_69[0][0]

batch_normalization_72 (BatchNo (None, 13, 1
3, 64) 192 conv2d_72[0][0]

activation_67 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_67
[0][0]

activation_69 (Activation) (None, 13, 1
3, 32) 0 batch_normalization_69
[0][0]

activation_72 (Activation) (None, 13, 1
3, 64) 0 batch_normalization_72
[0][0]

block35_10_mixed (Concatenate) (None, 13, 1
3, 128) 0 activation_67[0][0]
activation_69[0][0]
activation_72[0][0]

block35_10_conv (Conv2D) (None, 13, 1
3, 320) 41280 block35_10_mixed[0][0]

block35_10 (Lambda) (None, 13, 1
3, 320) 0 block35_9_ac[0][0]

block35_10_ac (Activation) (None, 13, 1
3, 320) 0 block35_10[0][0]

conv2d_74 (Conv2D) (None, 13, 1
3, 256) 81920 block35_10_ac[0][0]

batch_normalization_74 (BatchNo (None, 13, 1
3, 256) 768 conv2d_74[0][0]

activation_74 (Activation) (None, 13, 1
3, 256) 0 batch_normalization_74
[0][0]

conv2d_75 (Conv2D) (None, 13, 1
3, 256) 589824 activation_74[0][0]

batch_normalization_75 (BatchNo (None, 13, 1
3, 256) 768 conv2d_75[0][0]

activation_75 (Activation) (None, 13, 1
3, 256) 0 batch_normalization_75
[0][0]

conv2d_73 (Conv2D) (None, 6, 6,
384) 1105920 block35_10_ac[0][0]

conv2d_76 (Conv2D) (None, 6, 6,
384) 884736 activation_75[0][0]

batch_normalization_73 (BatchNo (None, 6, 6,
384) 1152 conv2d_73[0][0]

batch_normalization_76 (BatchNo (None, 6, 6,
384) 1152 conv2d_76[0][0]

activation_73 (Activation) (None, 6, 6,
384) 0 batch_normalization_73
[0][0]

activation_76 (Activation) (None, 6, 6,
384) 0 batch_normalization_76
[0][0]

max_pooling2d_3 (MaxPooling2D) (None, 6, 6,
320) 0 block35_10_ac[0][0]

mixed_6a (Concatenate) (None, 6, 6,
1088) 0 activation_73[0][0]

activation_76[0][0]

max_pooling2d_3[0][0]

conv2d_78 (Conv2D) (None, 6, 6,
128) 139264 mixed_6a[0][0]

batch_normalization_78 (BatchNo (None, 6, 6,
128) 384 conv2d_78[0][0]

activation_78 (Activation) (None, 6, 6,
128) 0 batch_normalization_78
[0][0]

conv2d_79 (Conv2D) (None, 6, 6

conv2d_78 (Conv2D) (None, 6, 6,
160) 143360 activation_78[0][0]

batch_normalization_79 (BatchNo (None, 6, 6,
160) 480 conv2d_79[0][0]

activation_79 (Activation) (None, 6, 6,
160) 0 batch_normalization_79
[0][0]

conv2d_77 (Conv2D) (None, 6, 6,
192) 208896 mixed_6a[0][0]

conv2d_80 (Conv2D) (None, 6, 6,
192) 215040 activation_79[0][0]

batch_normalization_77 (BatchNo (None, 6, 6,
192) 576 conv2d_77[0][0]

batch_normalization_80 (BatchNo (None, 6, 6,
192) 576 conv2d_80[0][0]

activation_77 (Activation) (None, 6, 6,
192) 0 batch_normalization_77
[0][0]

activation_80 (Activation) (None, 6, 6,
192) 0 batch_normalization_80
[0][0]

block17_1_mixed (Concatenate) (None, 6, 6,
384) 0 activation_77[0][0]

activation_80[0][0]

block17_1_conv (Conv2D) (None, 6, 6,
1088) 418880 block17_1_mixed[0][0]

block17_1 (Lambda) (None, 6, 6,
1088) 0 mixed_6a[0][0]

block17_1_conv[0][0]

block17_1_ac (Activation) (None, 6, 6,
1088) 0 block17_1[0][0]

conv2d_82 (Conv2D) (None, 6, 6, 128) 139264 block17_1_ac[0][0]

```
batch_normalization_82 (BatchNo (None, 6, 6,  
128)      384          conv2d_82[0][0]
```

```
activation_82 (Activation)      (None, 6, 6,
    128)    0          batch_normalization_82
[0][0]
```

conv2d_83 (Conv2D) (None, 6, 6, 160) 143360 activation_82[0][0]

batch_normalization_83 (BatchNo (None, 6, 6, 160) 480 conv2d_83[0][0]

```
activation_83 (Activation)      (None, 6, 6,
    160)     0           batch_normalization_83
[0][0]
```

conv2d_81 (Conv2D) (None, 6, 6, 192) 208896 block17_1_ac[0][0]

conv2d_84 (Conv2D) (None, 6, 6, 192) 215040 activation_83[0][0]

batch_normalization_81 (BatchNo (None, 6, 6,
100) 771 3.0e+00)

batch_normalization_84 (BatchNo (None, 6, 6,
192) 576 conv2d_84[0][0]

activation_81 (Activation) (None, 6, 6,
192) 0 batch_normalization_81
[0][0]

activation_84 (Activation) (None, 6, 6,
192) 0 batch_normalization_84
[0][0]

block17_2_mixed (Concatenate) (None, 6, 6,
384) 0 activation_81[0][0]

activation_84[0][0]

block17_2_conv (Conv2D) (None, 6, 6,
1088) 418880 block17_2_mixed[0][0]

block17_2 (Lambda) (None, 6, 6,
1088) 0 block17_1_ac[0][0]

block17_2_conv[0][0]

block17_2_ac (Activation) (None, 6, 6,
1088) 0 block17_2[0][0]

conv2d_86 (Conv2D) (None, 6, 6,
128) 139264 block17_2_ac[0][0]

batch_normalization_86 (BatchNo (None, 6, 6,
128) 384 conv2d_86[0][0]

activation_86 (Activation) (None, 6, 6,
128) 0 batch_normalization_86

```
[0][0]
-----
-----
conv2d_87 (Conv2D)          (None, 6, 6,
160)    143360      activation_86[0][0]
-----
-----
batch_normalization_87 (BatchNo (None, 6, 6,
160)    480        conv2d_87[0][0]
-----
-----
activation_87 (Activation)  (None, 6, 6,
160)    0          batch_normalization_87
[0][0]
-----
-----
conv2d_85 (Conv2D)          (None, 6, 6,
192)    208896      block17_2_ac[0][0]
-----
-----
conv2d_88 (Conv2D)          (None, 6, 6,
192)    215040      activation_87[0][0]
-----
-----
batch_normalization_85 (BatchNo (None, 6, 6,
192)    576        conv2d_85[0][0]
-----
-----
batch_normalization_88 (BatchNo (None, 6, 6,
192)    576        conv2d_88[0][0]
-----
-----
activation_85 (Activation)  (None, 6, 6,
192)    0          batch_normalization_85
[0][0]
-----
-----
activation_88 (Activation)  (None, 6, 6,
192)    0          batch_normalization_88
[0][0]
-----
-----
block17_3_mixed (Concatenate) (None, 6, 6,
384)    0          activation_85[0][0]
-----
activation_88[0][0]
```

```
-----  
block17_3_conv (Conv2D)           (None, 6, 6,  
1088)    418880      block17_3_mixed[0][0]  
  
-----  
-----  
block17_3 (Lambda)             (None, 6, 6,  
1088)    0          block17_2_ac[0][0]  
  
-----  
-----  
-----  
block17_3_ac (Activation)     (None, 6, 6,  
1088)    0          block17_3[0][0]  
  
-----  
-----  
-----  
conv2d_90 (Conv2D)            (None, 6, 6,  
128)     139264      block17_3_ac[0][0]  
  
-----  
-----  
-----  
batch_normalization_90 (BatchNo (None, 6, 6,  
128)    384        conv2d_90[0][0]  
  
-----  
-----  
-----  
activation_90 (Activation)   (None, 6, 6,  
128)    0          batch_normalization_90  
[0][0]  
  
-----  
-----  
-----  
conv2d_91 (Conv2D)            (None, 6, 6,  
160)     143360      activation_90[0][0]  
  
-----  
-----  
-----  
batch_normalization_91 (BatchNo (None, 6, 6,  
160)    480        conv2d_91[0][0]  
  
-----  
-----  
-----  
activation_91 (Activation)   (None, 6, 6,  
160)    0          batch_normalization_91  
[0][0]  
  
-----  
-----  
-----  
conv2d_89 (Conv2D)            (None, 6, 6,  
192)     208896      block17_3_ac[0][0]  
  
-----  
-----  
-----  
conv2d_92 (Conv2D)            (None, 6, 6,  
192)     215040      activation_91[0][0]
```

```
-----  
-----  
batch_normalization_89 (BatchNo (None, 6, 6,  
192)      576          conv2d_89[0][0]  
  
-----  
-----  
batch_normalization_92 (BatchNo (None, 6, 6,  
192)      576          conv2d_92[0][0]  
  
-----  
-----  
activation_89 (Activation)      (None, 6, 6,  
192)      0            batch_normalization_89  
[0][0]  
  
-----  
-----  
activation_92 (Activation)      (None, 6, 6,  
192)      0            batch_normalization_92  
[0][0]  
  
-----  
-----  
block17_4_mixed (Concatenate)   (None, 6, 6,  
384)      0            activation_89[0][0]  
  
                                         activation_92[0][0]  
  
-----  
-----  
block17_4_conv (Conv2D)         (None, 6, 6,  
1088)     418880        block17_4_mixed[0][0]  
  
-----  
-----  
block17_4 (Lambda)             (None, 6, 6,  
1088)     0            block17_3_ac[0][0]  
  
                                         block17_4_conv[0][0]  
  
-----  
-----  
block17_4_ac (Activation)     (None, 6, 6,  
1088)     0            block17_4[0][0]  
  
-----  
-----  
conv2d_94 (Conv2D)            (None, 6, 6,  
128)      139264        block17_4_ac[0][0]  
  
-----  
-----  
batch_normalization_94 (BatchNo (None, 6, 6,  
128)      384          conv2d_94[0][0]
```

```
-----  
-----  
activation_94 (Activation)      (None, 6, 6,  
128)    0           batch_normalization_94  
[0][0]  
-----  
-----  
conv2d_95 (Conv2D)            (None, 6, 6,  
160)    143360       activation_94[0][0]  
-----  
-----  
batch_normalization_95 (BatchNo (None, 6, 6,  
160)    480           conv2d_95[0][0]  
-----  
-----  
activation_95 (Activation)      (None, 6, 6,  
160)    0           batch_normalization_95  
[0][0]  
-----  
-----  
conv2d_93 (Conv2D)            (None, 6, 6,  
192)    208896       block17_4_ac[0][0]  
-----  
-----  
conv2d_96 (Conv2D)            (None, 6, 6,  
192)    215040       activation_95[0][0]  
-----  
-----  
batch_normalization_93 (BatchNo (None, 6, 6,  
192)    576           conv2d_93[0][0]  
-----  
-----  
batch_normalization_96 (BatchNo (None, 6, 6,  
192)    576           conv2d_96[0][0]  
-----  
-----  
activation_93 (Activation)      (None, 6, 6,  
192)    0           batch_normalization_93  
[0][0]  
-----  
-----  
activation_96 (Activation)      (None, 6, 6,  
192)    0           batch_normalization_96  
[0][0]  
-----  
-----  
block17_5_mixed (Concatenate)  (None, 6, 6,  
384)    0           activation_93[0][0]
```

activation_96[0][0]

```
-----  
-----  
conv2d_100 (Conv2D)           (None, 6, 6,  
192)    215040      activation_99[0][0]  
  
-----  
-----  
batch_normalization_97 (BatchNo (None, 6, 6,  
192)    576        conv2d_97[0][0]  
  
-----  
-----  
batch_normalization_100 (BatchN (None, 6, 6,  
192)    576        conv2d_100[0][0]  
  
-----  
-----  
activation_97 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_97  
[0][0]  
  
-----  
-----  
activation_100 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_100  
[0][0]  
  
-----  
-----  
block17_6_mixed (Concatenate) (None, 6, 6,  
384)    0          activation_97[0][0]  
  
                               activation_100[0][0]  
  
-----  
-----  
block17_6_conv (Conv2D)       (None, 6, 6,  
1088)   418880      block17_6_mixed[0][0]  
  
-----  
-----  
block17_6 (Lambda)           (None, 6, 6,  
1088)   0          block17_5_ac[0][0]  
  
                               block17_6_conv[0][0]  
  
-----  
-----  
block17_6_ac (Activation)   (None, 6, 6,  
1088)   0          block17_6[0][0]  
  
-----  
-----  
conv2d_102 (Conv2D)         (None, 6, 6,  
128)    139264     block17_6_ac[0][0]
```

batch_normalization_102 (BatchN (None, 6, 6,
128) 384 conv2d_102[0][0]

activation_102 (Activation) (None, 6, 6,
128) 0 batch_normalization_102
[0][0]

conv2d_103 (Conv2D) (None, 6, 6,
160) 143360 activation_102[0][0]

batch_normalization_103 (BatchN (None, 6, 6,
160) 480 conv2d_103[0][0]

activation_103 (Activation) (None, 6, 6,
160) 0 batch_normalization_103
[0][0]

conv2d_101 (Conv2D) (None, 6, 6,
192) 208896 block17_6_ac[0][0]

conv2d_104 (Conv2D) (None, 6, 6,
192) 215040 activation_103[0][0]

batch_normalization_101 (BatchN (None, 6, 6,
192) 576 conv2d_101[0][0]

batch_normalization_104 (BatchN (None, 6, 6,
192) 576 conv2d_104[0][0]

activation_101 (Activation) (None, 6, 6,
192) 0 batch_normalization_101
[0][0]

activation_104 (Activation) (None, 6, 6,
192) 0 batch_normalization_104
[0][0]


```
-----  
conv2d_105 (Conv2D)           (None, 6, 6,  
192)    208896      block17_7_ac[0][0]  
  
-----  
-----  
conv2d_108 (Conv2D)           (None, 6, 6,  
192)    215040      activation_107[0][0]  
  
-----  
-----  
batch_normalization_105 (BatchN (None, 6, 6,  
192)    576        conv2d_105[0][0]  
  
-----  
-----  
batch_normalization_108 (BatchN (None, 6, 6,  
192)    576        conv2d_108[0][0]  
  
-----  
-----  
activation_105 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_105  
[0][0]  
  
-----  
-----  
activation_108 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_108  
[0][0]  
  
-----  
-----  
block17_8_mixed (Concatenate) (None, 6, 6,  
384)    0          activation_105[0][0]  
  
                               activation_108[0][0]  
  
-----  
-----  
-----  
block17_8_conv (Conv2D)       (None, 6, 6,  
1088)   418880     block17_8_mixed[0][0]  
  
-----  
-----  
-----  
block17_8 (Lambda)           (None, 6, 6,  
1088)   0          block17_7_ac[0][0]  
  
                               block17_8_conv[0][0]  
  
-----  
-----  
-----  
block17_8_ac (Activation)    (None, 6, 6,  
1088)   0          block17_8[0][0]  
  
-----  
-----
```

conv2d_110 (Conv2D) (None, 6, 6,
128) 139264 block17_8_ac[0][0]

batch_normalization_110 (BatchN (None, 6, 6,
128) 384 conv2d_110[0][0]

activation_110 (Activation) (None, 6, 6,
128) 0 batch_normalization_110
[0][0]

conv2d_111 (Conv2D) (None, 6, 6,
160) 143360 activation_110[0][0]

batch_normalization_111 (BatchN (None, 6, 6,
160) 480 conv2d_111[0][0]

activation_111 (Activation) (None, 6, 6,
160) 0 batch_normalization_111
[0][0]

conv2d_109 (Conv2D) (None, 6, 6,
192) 208896 block17_8_ac[0][0]

conv2d_112 (Conv2D) (None, 6, 6,
192) 215040 activation_111[0][0]

batch_normalization_109 (BatchN (None, 6, 6,
192) 576 conv2d_109[0][0]

batch_normalization_112 (BatchN (None, 6, 6,
192) 576 conv2d_112[0][0]

activation_109 (Activation) (None, 6, 6,
192) 0 batch_normalization_109
[0][0]

```
activation_112 (Activation)      (None, 6, 6,
192)    0           batch_normalization_112
[0][0]

-----
-----
```

block17_9_mixed (Concatenate) (None, 6, 6,
384) 0 activation_109[0][0]

```
activation_112[0][0]
```

```
-----
```

```
block17_9_conv (Conv2D)        (None, 6, 6,
1088)   418880       block17_9_mixed[0][0]
```

```
-----
```

```
block17_9 (Lambda)            (None, 6, 6,
1088)    0           block17_8_ac[0][0]
```

```
block17_9_conv[0][0]
```

```
-----
```

```
block17_9_ac (Activation)     (None, 6, 6,
1088)    0           block17_9[0][0]
```

```
-----
```

```
conv2d_114 (Conv2D)          (None, 6, 6,
128)    139264       block17_9_ac[0][0]
```

```
-----
```

```
batch_normalization_114 (BatchN (None, 6, 6,
128)    384         conv2d_114[0][0]
```

```
-----
```

```
activation_114 (Activation)   (None, 6, 6,
128)    0           batch_normalization_114
[0][0]
```

```
-----
```

```
conv2d_115 (Conv2D)          (None, 6, 6,
160)    143360       activation_114[0][0]
```

```
-----
```

```
batch_normalization_115 (BatchN (None, 6, 6,
160)    480         conv2d_115[0][0]
```

```
-----
```

```
activation_115 (Activation)      (None, 6, 6,
160)    0           batch_normalization_115
[0][0]
-----
-----
-----
conv2d_113 (Conv2D)            (None, 6, 6,
192)    208896      block17_9_ac[0][0]
-----
-----
-----
conv2d_116 (Conv2D)            (None, 6, 6,
192)    215040      activation_115[0][0]
-----
-----
-----
batch_normalization_113 (BatchN (None, 6, 6,
192)    576        conv2d_113[0][0]
-----
-----
-----
batch_normalization_116 (BatchN (None, 6, 6,
192)    576        conv2d_116[0][0]
-----
-----
-----
activation_113 (Activation)    (None, 6, 6,
192)    0           batch_normalization_113
[0][0]
-----
-----
-----
activation_116 (Activation)    (None, 6, 6,
192)    0           batch_normalization_116
[0][0]
-----
-----
-----
block17_10_mixed (Concatenate) (None, 6, 6,
384)    0           activation_113[0][0]
activation_116[0][0]
-----
-----
-----
block17_10_conv (Conv2D)       (None, 6, 6,
1088)   418880     block17_10_mixed[0][0]
-----
-----
-----
block17_10 (Lambda)            (None, 6, 6,
1088)   0           block17_9_ac[0][0]
block17_10_conv[0][0]
-----
-----
-----
block17_10_ac (Activation)    (None, 6, 6,
```

```
block17_10_ac (Activation)      (None, 6, 6,
1088)    0                      block17_10[0][0]

-----
-----  
conv2d_118 (Conv2D)           (None, 6, 6,
128)    139264                block17_10_ac[0][0]

-----
-----  
batch_normalization_118 (BatchN (None, 6, 6,
128)    384                  conv2d_118[0][0]

-----
-----  
activation_118 (Activation)   (None, 6, 6,
128)    0                      batch_normalization_118
[0][0]

-----
-----  
conv2d_119 (Conv2D)           (None, 6, 6,
160)    143360                activation_118[0][0]

-----
-----  
batch_normalization_119 (BatchN (None, 6, 6,
160)    480                  conv2d_119[0][0]

-----
-----  
activation_119 (Activation)   (None, 6, 6,
160)    0                      batch_normalization_119
[0][0]

-----
-----  
conv2d_117 (Conv2D)           (None, 6, 6,
192)    208896                block17_10_ac[0][0]

-----
-----  
conv2d_120 (Conv2D)           (None, 6, 6,
192)    215040                activation_119[0][0]

-----
-----  
batch_normalization_117 (BatchN (None, 6, 6,
192)    576                  conv2d_117[0][0]

-----
-----  
batch_normalization_120 (BatchN (None, 6, 6,
192)    576                  conv2d_120[0][0]

-----
-----  
activation_117 (Activation)   (None, 6, 6,
```

```
    192)      0           batch_normalization_117
[0][0]
-----
-----
activation_120 (Activation)      (None, 6, 6,
    192)      0           batch_normalization_120
[0][0]
-----
-----
block17_11_mixed (Concatenate) (None, 6, 6,
    384)      0           activation_117[0][0]

activation_120[0][0]
-----
-----
block17_11_conv (Conv2D)        (None, 6, 6,
    1088)   418880       block17_11_mixed[0][0]
-----
-----
block17_11 (Lambda)            (None, 6, 6,
    1088)      0           block17_10_ac[0][0]

block17_11_conv[0][0]
-----
-----
block17_11_ac (Activation)     (None, 6, 6,
    1088)      0           block17_11[0][0]
-----
-----
conv2d_122 (Conv2D)            (None, 6, 6,
    128)     139264       block17_11_ac[0][0]
-----
-----
batch_normalization_122 (BatchN (None, 6, 6,
    128)     384         conv2d_122[0][0]
-----
-----
activation_122 (Activation)    (None, 6, 6,
    128)      0           batch_normalization_122
[0][0]
-----
-----
conv2d_123 (Conv2D)            (None, 6, 6,
    160)     143360       activation_122[0][0]
-----
-----
batch_normalization_123 (BatchN (None, 6, 6,
```

160) 480 conv2d_123[0][0]

activation_123 (Activation) (None, 6, 6,
160) 0 batch_normalization_123
[0][0]

conv2d_121 (Conv2D) (None, 6, 6,
192) 208896 block17_11_ac[0][0]

conv2d_124 (Conv2D) (None, 6, 6,
192) 215040 activation_123[0][0]

batch_normalization_121 (BatchN (None, 6, 6,
192) 576 conv2d_121[0][0]

batch_normalization_124 (BatchN (None, 6, 6,
192) 576 conv2d_124[0][0]

activation_121 (Activation) (None, 6, 6,
192) 0 batch_normalization_121
[0][0]

activation_124 (Activation) (None, 6, 6,
192) 0 batch_normalization_124
[0][0]

block17_12_mixed (Concatenate) (None, 6, 6,
384) 0 activation_121[0][0]

activation_124[0][0]

block17_12_conv (Conv2D) (None, 6, 6,
1088) 418880 block17_12_mixed[0][0]

block17_12 (Lambda) (None, 6, 6,
1088) 0 block17_11_ac[0][0]

block17_12_ac (Activation) (None, 6, 6,
1088) 0 block17_12[0][0]

conv2d_126 (Conv2D) (None, 6, 6, 128) 139264 block17_12_ac[0][0]

```
batch_normalization_126 (BatchN (None, 6, 6,
    128)      384          conv2d_126[0][0]
```

```
activation_126 (Activation)      (None, 6, 6,
 128)    0                      batch_normalization_126
[0][0]
```

conv2d_127 (Conv2D) (None, 6, 6, 160) 143360 activation_126[0][0]

```
batch_normalization_127 (BatchN (None, 6, 6,  
160) 480 conv2d_127[0][0]
```

```
activation_127 (Activation)      (None, 6, 6,
 160)    0                      batch_normalization_127
[0][0]
```

conv2d_125 (Conv2D) (None, 6, 6, 192) 208896 block17_12_ac[0][0]

conv2d_128 (Conv2D) (None, 6, 6, 192) 215040 activation_127[0][0]

batch_normalization_125 (BatchN (None, 6, 6,
192) 576 conv2d_125[0][0]

batch_normalization_128 (BatchN (None, 6, 6, 192) 576 copy2d_128[0][0]

```
-----  
-----  
activation_125 (Activation)      (None, 6, 6,  
192)    0           batch_normalization_125  
[0][0]  
-----  
-----  
activation_128 (Activation)      (None, 6, 6,  
192)    0           batch_normalization_128  
[0][0]  
-----  
-----  
block17_13_mixed (Concatenate)  (None, 6, 6,  
384)    0           activation_125[0][0]  
  
                                         activation_128[0][0]  
-----  
-----  
block17_13_conv (Conv2D)        (None, 6, 6,  
1088)   418880     block17_13_mixed[0][0]  
-----  
-----  
block17_13 (Lambda)            (None, 6, 6,  
1088)   0           block17_12_ac[0][0]  
  
                                         block17_13_conv[0][0]  
-----  
-----  
block17_13_ac (Activation)     (None, 6, 6,  
1088)   0           block17_13[0][0]  
-----  
-----  
conv2d_130 (Conv2D)           (None, 6, 6,  
128)    139264     block17_13_ac[0][0]  
-----  
-----  
batch_normalization_130 (BatchN (None, 6, 6,  
128)    384         conv2d_130[0][0]  
-----  
-----  
activation_130 (Activation)    (None, 6, 6,  
128)    0           batch_normalization_130  
[0][0]  
-----  
-----  
conv2d_131 (Conv2D)           (None, 6, 6,  
160)    143360     activation_130[0][0]
```

```
-----  
-----  
batch_normalization_131 (BatchN (None, 6, 6,  
160) 480 conv2d_131[0][0]  
  
-----  
-----  
activation_131 (Activation) (None, 6, 6,  
160) 0 batch_normalization_131  
[0][0]  
  
-----  
-----  
conv2d_129 (Conv2D) (None, 6, 6,  
192) 208896 block17_13_ac[0][0]  
  
-----  
-----  
conv2d_132 (Conv2D) (None, 6, 6,  
192) 215040 activation_131[0][0]  
  
-----  
-----  
batch_normalization_129 (BatchN (None, 6, 6,  
192) 576 conv2d_129[0][0]  
  
-----  
-----  
batch_normalization_132 (BatchN (None, 6, 6,  
192) 576 conv2d_132[0][0]  
  
-----  
-----  
activation_129 (Activation) (None, 6, 6,  
192) 0 batch_normalization_129  
[0][0]  
  
-----  
-----  
activation_132 (Activation) (None, 6, 6,  
192) 0 batch_normalization_132  
[0][0]  
  
-----  
-----  
block17_14_mixed (Concatenate) (None, 6, 6,  
384) 0 activation_129[0][0]  
  
-----  
-----  
activation_132[0][0]  
  
-----  
-----  
block17_14_conv (Conv2D) (None, 6, 6,  
1088) 418880 block17_14_mixed[0][0]  
  
-----  
-----
```

block17_14 (Lambda) (None, 6, 6, 1088) 0 block17_13_ac[0][0]

block17_14_ac (Activation) (None, 6, 6, 1088) 0 block17_14[0][0]

conv2d_134 (Conv2D) (None, 6, 6, 128) 139264 block17_14_ac[0][0]

batch_normalization_134 (BatchN (None, 6, 6, 128) 384 conv2d_134[0][0]

activation_134 (Activation) (None, 6, 6, 128) 0 batch_normalization_134[0][0]

conv2d_135 (Conv2D) (None, 6, 6, 160) 143360 activation_134[0][0]

batch_normalization_135 (BatchN (None, 6, 6, 160) 480 conv2d_135[0][0]

activation_135 (Activation) (None, 6, 6, 160) 0 batch_normalization_135[0][0]

conv2d_133 (Conv2D) (None, 6, 6, 192) 208896 block17_14_ac[0][0]

conv2d_136 (Conv2D) (None, 6, 6, 192) 215040 activation_135[0][0]

batch_normalization_133 (BatchN (None, 6, 6, 192) 576 conv2d_133[0][0]

```
-----  
batch_normalization_136 (BatchN (None, 6, 6,  
192)      576          conv2d_136[0][0]  
  
-----  
  
activation_133 (Activation)      (None, 6, 6,  
192)      0            batch_normalization_133  
[0][0]  
  
-----  
  
activation_136 (Activation)      (None, 6, 6,  
192)      0            batch_normalization_136  
[0][0]  
  
-----  
  
block17_15_mixed (Concatenate)  (None, 6, 6,  
384)      0            activation_133[0][0]  
  
-----  
  
activation_136[0][0]  
  
-----  
  
block17_15_conv (Conv2D)        (None, 6, 6,  
1088)     418880        block17_15_mixed[0][0]  
  
-----  
  
block17_15 (Lambda)            (None, 6, 6,  
1088)     0            block17_14_ac[0][0]  
  
-----  
  
block17_15_conv[0][0]  
  
-----  
  
block17_15_ac (Activation)    (None, 6, 6,  
1088)     0            block17_15[0][0]  
  
-----  
  
conv2d_138 (Conv2D)           (None, 6, 6,  
128)      139264       block17_15_ac[0][0]  
  
-----  
  
batch_normalization_138 (BatchN (None, 6, 6,  
128)      384          conv2d_138[0][0]  
  
-----  
  
activation_138 (Activation)    (None, 6, 6,  
128)      0            batch_normalization_138  
[0][0]
```

```
-----  
conv2d_139 (Conv2D)           (None, 6, 6,  
160)    143360      activation_138[0][0]  
  
-----  
batch_normalization_139 (BatchN (None, 6, 6,  
160)    480        conv2d_139[0][0]  
  
-----  
activation_139 (Activation)   (None, 6, 6,  
160)    0          batch_normalization_139  
[0][0]  
  
-----  
conv2d_137 (Conv2D)           (None, 6, 6,  
192)    208896      block17_15_ac[0][0]  
  
-----  
conv2d_140 (Conv2D)           (None, 6, 6,  
192)    215040      activation_139[0][0]  
  
-----  
batch_normalization_137 (BatchN (None, 6, 6,  
192)    576        conv2d_137[0][0]  
  
-----  
batch_normalization_140 (BatchN (None, 6, 6,  
192)    576        conv2d_140[0][0]  
  
-----  
activation_137 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_137  
[0][0]  
  
-----  
activation_140 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_140  
[0][0]  
  
-----  
block17_16_mixed (Concatenate) (None, 6, 6,  
384)    0          activation_137[0][0]  
  
-----  
activation_140[0][0]  
  
-----  
block17_16_conv (Conv2D)       (None, 6, 6,
```

```
1088) 418880 block17_16_mixed[0][0]
```

```
-----  
-----  
-----  
block17_16 (Lambda) (None, 6, 6,  
1088) 0 block17_15_ac[0][0]
```

```
-----  
-----  
-----  
block17_16_conv[0][0]
```

```
-----  
-----  
-----  
block17_16_ac (Activation) (None, 6, 6,  
1088) 0 block17_16[0][0]
```

```
-----  
-----  
-----  
conv2d_142 (Conv2D) (None, 6, 6,  
128) 139264 block17_16_ac[0][0]
```

```
-----  
-----  
-----  
batch_normalization_142 (BatchN (None, 6, 6,  
128) 384 conv2d_142[0][0]
```

```
-----  
-----  
-----  
activation_142 (Activation) (None, 6, 6.
```

InceptionResNetV2

Python notebook using data from [multiple data sources](#) · 99 views · 🔍 multiple data sources [Edit tags](#)



Version 2

12 commits

forked from Resnet50
pretrained (0.406)

```
-----  
-----  
-----  
conv2d_143 (Conv2D) (None, 6, 6,  
160) 143360 activation_142[0][0]
```

Notebook

Data

Output

Log

Comments

```
-----  
-----  
-----  
activation_143 (Activation) (None, 6, 6,  
160) 0 batch_normalization_143  
[0][0]
```

```
-----  
-----  
-----  
conv2d_141 (Conv2D) (None, 6, 6,  
192) 208896 block17_16_ac[0][0]
```

```
-----  
-----  
-----  
conv2d_144 (Conv2D) (None, 6, 6,  
192) 215040 activation_143[0][0]
```

```
-----  
batch_normalization_141 (BatchN (None, 6, 6,  
192) 576 conv2d_141[0][0]
```

```
-----  
batch_normalization_144 (BatchN (None, 6, 6,  
192) 576 conv2d_144[0][0]
```

```
-----  
activation_141 (Activation) (None, 6, 6,  
192) 0 batch_normalization_141  
[0][0]
```

```
-----  
activation_144 (Activation) (None, 6, 6,  
192) 0 batch_normalization_144  
[0][0]
```

```
-----  
block17_17_mixed (Concatenate) (None, 6, 6,  
384) 0 activation_141[0][0]
```

```
activation_144[0][0]
```

 Notebook  Data  Output  Log  Comments

```
-----  
block17_17 (Lambda) (None, 6, 6,  
1088) 0 block17_16_ac[0][0]
```

```
block17_17_conv[0][0]
```

```
-----  
block17_17_ac (Activation) (None, 6, 6,  
1088) 0 block17_17[0][0]
```

```
-----  
conv2d_146 (Conv2D) (None, 6, 6,  
128) 139264 block17_17_ac[0][0]
```

```
-----  
batch_normalization_146 (BatchN (None, 6, 6,  
128) 384 conv2d_146[0][0]
```

activation_146 (Activation) (None, 6, 6,
128) 0 batch_normalization_146
[0][0]

conv2d_147 (Conv2D) (None, 6, 6,
160) 143360 activation_146[0][0]

batch_normalization_147 (BatchN (None, 6, 6,
160) 480 conv2d_147[0][0]

activation_147 (Activation) (None, 6, 6,
160) 0 batch_normalization_147
[0][0]

conv2d_145 (Conv2D) (None, 6, 6,
192) 208896 block17_17_ac[0][0]

conv2d_148 (Conv2D) (None, 6, 6,
192) 215040 activation_147[0][0]

batch_normalization_145 (BatchN (None, 6, 6,
192) 576 conv2d_145[0][0]

batch_normalization_148 (BatchN (None, 6, 6,
192) 576 conv2d_148[0][0]

activation_145 (Activation) (None, 6, 6,
192) 0 batch_normalization_145
[0][0]

activation_148 (Activation) (None, 6, 6,
192) 0 batch_normalization_148
[0][0]

block17_18_mixed (Concatenate) (None, 6, 6,
384) 0 activation_145[0][0]

activation_148[0][0]

```
block17_18_conv (Conv2D)      (None, 6, 6, 1088)  418880    block17_18_mixed[0][0]
```

block17_18 (Lambda) (None, 6, 6,
1088) 0 block17_17_ac[0][0]

block17_18_conv[0][0]

block17_18_ac (Activation) (None, 6, 6,
1088) 0 block17_18[0][0]

conv2d_150 (Conv2D) (None, 6, 6, 128) 139264 block17_18_ac[0][0]

```
batch_normalization_150 (BatchN (None, 6, 6,  
128) 384 conv2d_150[0][0]
```

```
activation_150 (Activation)      (None, 6, 6,
    128)     0           batch_normalization_150
[0][0]
```

conv2d_151 (Conv2D) (None, 6, 6, 160) 143360 activation_150[0][0]

batch_normalization_151 (BatchN (None, 6, 6, 160) 480 conv2d_151[0][0]

```
activation_151 (Activation)      (None, 6, 6,
    160)      0          batch_normalization_151
[0][0]
```

conv2d_149 (Conv2D) (None, 6, 6, 192) 208896 block17_18_ac[0][0]

```
-----  
conv2d_152 (Conv2D)           (None, 6, 6,  
192)    215040      activation_151[0][0]  
  
-----  
batch_normalization_149 (BatchN (None, 6, 6,  
192)    576        conv2d_149[0][0]  
  
-----  
batch_normalization_152 (BatchN (None, 6, 6,  
192)    576        conv2d_152[0][0]  
  
-----  
activation_149 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_149  
[0][0]  
  
-----  
activation_152 (Activation)   (None, 6, 6,  
192)    0          batch_normalization_152  
[0][0]  
  
-----  
block17_19_mixed (Concatenate) (None, 6, 6,  
384)    0          activation_149[0][0]  
  
                               activation_152[0][0]  
  
-----  
-----  
block17_19_conv (Conv2D)       (None, 6, 6,  
1088)   418880      block17_19_mixed[0][0]  
  
-----  
-----  
block17_19 (Lambda)           (None, 6, 6,  
1088)   0          block17_18_ac[0][0]  
  
                               block17_19_conv[0][0]  
  
-----  
-----  
block17_19_ac (Activation)    (None, 6, 6,  
1088)   0          block17_19[0][0]
```

This kernel has been released under the [Apache 2.0](#) open source license.

Data

Data Sources

- ▼ 🏆 Humpback Whale I...
 - sa... 7960 x 2
 - trai... 25.4k x 2
- ▼ 📄 test.zip
 - 0027089a4.jpg
 - 00313e2d2.jpg
 - 004344e9f.jpg
 - 008a4bc86.jpg
 - 00ac0fcfa6.jpg
 - 00ff45291.jpg
 - 012dbdb59.jpg
 - 0169cec0e.jpg
 - 01830c9cf.jpg
 - 01b1ecf7b.jpg
 - ... 1000+ more
- ▼ 📄 train.zip
 - 002b4615d.jpg
 - 00600ce17.jpg
 - 00d641885.jpg
 - 00eaedfab.jpg
 - 00fee3975.jpg
 - 010a1f0eb.jpg
 - 01237f1ce.jpg
 - 01dc420f.jpg
 - 0202dfb29.jpg
 - 020ab0f9b.jpg
 - ... 1000+ more

Humpback Whale Identification

Can you identify a whale by its tail?

Last Updated: 2 months ago

About this Competition

This training data contains thousands of images of humpback whale flukes. Individual whales have been identified by researchers and given an `Id`. The challenge is to predict the whale `Id` of images in the test set. What makes this such a challenge is that there are only a few examples for each of 3,000+ whale `Ids`.

File descriptions

- `train.zip` - a folder containing the training images
- `train.csv` - maps the training `Image` to the appropriate whale `Id`. Whales that are not predicted to have a label identified in the training data should be labeled as `new_whale`.
- `test.zip` - a folder containing the test images to predict the whale `Id`
- `sample_submission.csv` - a sample submission file in the correct format

Output Files

[New Dataset](#)[New Kernel](#)[Download All](#)

Output Files

- submission.csv
- Model_InceptionRes...
- predicted_class_indi...
- predictions.npy
- test_class_indices.npy
- test_filenames_gene...
- Weights_InceptionR...

About this file

[Submit to Competition](#)

This file was created from a Kernel, it does not have a description.

■ submission.csv



1	Image	Id
2	00028a005.jpg	new_whale w_0e9f07a w_80124ae w_df6b050 w_02d138d
3	000dcf7d8.jpg	w_4132bb8 new_whale w_e3956f5 w_cf88f4b w_6e7763b

4	000e7c7df.jpg	w_194bea2 new_whale w_99e43ae w_6e0afa2 w_dd837b1	
5	0019c34f4.jpg	new_whale w_8b8dca8 w_75d0e61 w_23e1d57 w_0b1e4a6	
6	001a4d292.jpg	new_whale w_502e72f w_281a8cd w_799b208 w_ac33bfe	
7	00247bc36.jpg	new_whale w_23a388d w_7432816 w_4c07458 w_0f8b8e2	
8	0027089a4.jpg	w_7e2eb3d new_whale w_c200e52 w_5b227ec w_80124ae	
9	002de4d94.jpg	w_11e90bc new_whale w_abf193d w_a10e633 w_ae24bd1	
10	002f52f0c	new_whale	

Run Info

Succeeded	True	Run Time	8065.7 seconds
Exit Code	0	Queue Time	0 seconds
Docker Image Name	/python(Dockerfile)	Output Size	0
Timeout Exceeded	False	Used All Space	False
Failure Message			

Log

[Download Log](#)

```

Time  Line # Log Message
2.8s    1 [NbConvertApp] Converting notebook script.ipynb to html
2.9s    2 [NbConvertApp] Executing notebook with kernel: python3
120.6s   3 2019-01-21 12:39:40.344818: I
              tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:964]
              successful NUMA node read from SysFS had negative value (-1),
              but there must be at least one NUMA node, so returning NUMA
              node zero
120.6s   4 2019-01-21 12:39:40.345466: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:1432] Found
              device 0 with properties:
              name: Tesla K80 major: 3 minor: 7 memoryClockRate(GHz): 0.8235
              pciBusID: 0000:00:04.0
              totalMemory: 11.17GiB freeMemory: 11.10GiB
              2019-01-21 12:39:40.345496: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:1511] Adding
              visible gpu devices: 0
120.9s   5 2019-01-21 12:39:40.676502: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:982] Device
              interconnect StreamExecutor with strength 1 edge matrix:
              2019-01-21 12:39:40.676605: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:988]      0
              2019-01-21 12:39:40.676615: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:1001] 0:  N
120.9s   6 2019-01-21 12:39:40.676980: I
              tensorflow/core/common_runtime/gpu/gpu_device.cc:1115] Created
              TensorFlow device
              (/job:localhost/replica:0/task:0/device:GPU:0 with 10758 MB
              memory) -> physical GPU (device: 0, name: Tesla K80, pci bus
              id: 0000:00:04.0, compute capability: 3.7)
8064.7s   7 [NbConvertApp] Support files will be in __results__files/
              [NbConvertApp] Making directory __results__files
              [NbConvertApp] Making directory __results__files
              [NbConvertApp] Making directory __results__files
              [NbConvertApp] Writing 488338 bytes to __results__.html
8064.7s   8

```

Comments (0)



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