

CarStyle

October 2, 2024

```
[1]: import tensorflow as tf
import os
import cv2
import math
import json
import numpy as np
from matplotlib import pyplot as plt
from keras.applications import EfficientNetB7
from keras.models import Model
from keras.layers import Dense, GlobalAveragePooling2D
from keras.metrics import Precision, Recall, SparseCategoricalAccuracy

[2]: print("Num GPUs Available: ", len(tf.config.list_physical_devices('GPU')))
gpus = tf.config.experimental.list_physical_devices('GPU')
if gpus:
    try:
        for gpu in gpus:
            tf.config.experimental.set_memory_growth(gpu, True)
        logical_gpus = tf.config.experimental.list_logical_devices('GPU')
        print(len(gpus), "Physical GPUs,", len(logical_gpus), "Logical GPUs")
    except RuntimeError as e:
        print(e)
```

```
Num GPUs Available:  1
1 Physical GPUs, 1 Logical GPUs
```

```
[3]: base_dir = 'Styles'
train_dir = os.path.join(base_dir, 'train')
val_dir = os.path.join(base_dir, 'valid')
test_dir = os.path.join(base_dir, 'test')

img_size = (224, 224)
batch_size = 16

train_data = tf.keras.utils.image_dataset_from_directory(
    train_dir,
    image_size=img_size,
    batch_size=batch_size,
```

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        label_mode='int',
        interpolation='bilinear'
    )

    val_data = tf.keras.utils.image_dataset_from_directory(
        val_dir,
        image_size=img_size,
        batch_size=batch_size,
        label_mode='int',
        interpolation='bilinear'
    )

    test_data = tf.keras.utils.image_dataset_from_directory(
        test_dir,
        image_size=img_size,
        batch_size=batch_size,
        label_mode='int',
        interpolation='bilinear'
    )

```

Found 5350 files belonging to 7 classes.
 Found 1397 files belonging to 7 classes.
 Found 802 files belonging to 7 classes.

```

[4]: class_names = train_data.class_names
    print("Class names test:", class_names)

    with open('CarStyle map.json', 'w') as f:
        json.dump(class_names, f)

    data_iterator = train_data.as_numpy_iterator()

```

Class names test: ['Convertible', 'Coupe', 'Hatchback', 'Pick-Up', 'SUV', 'Sedan', 'VAN']

```

[5]: batch = data_iterator.next()
    num_classes = len(class_names)

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[6]: ncols = 4
    nrows = math.ceil(num_classes / ncols)
    fig, ax = plt.subplots(nrows=nrows, ncols=ncols, figsize=(20, 20))

    if nrows == 1:
        ax = ax.flatten()
    elif ncols == 1:
        ax = ax.flatten()

    plotted = set()

```

```

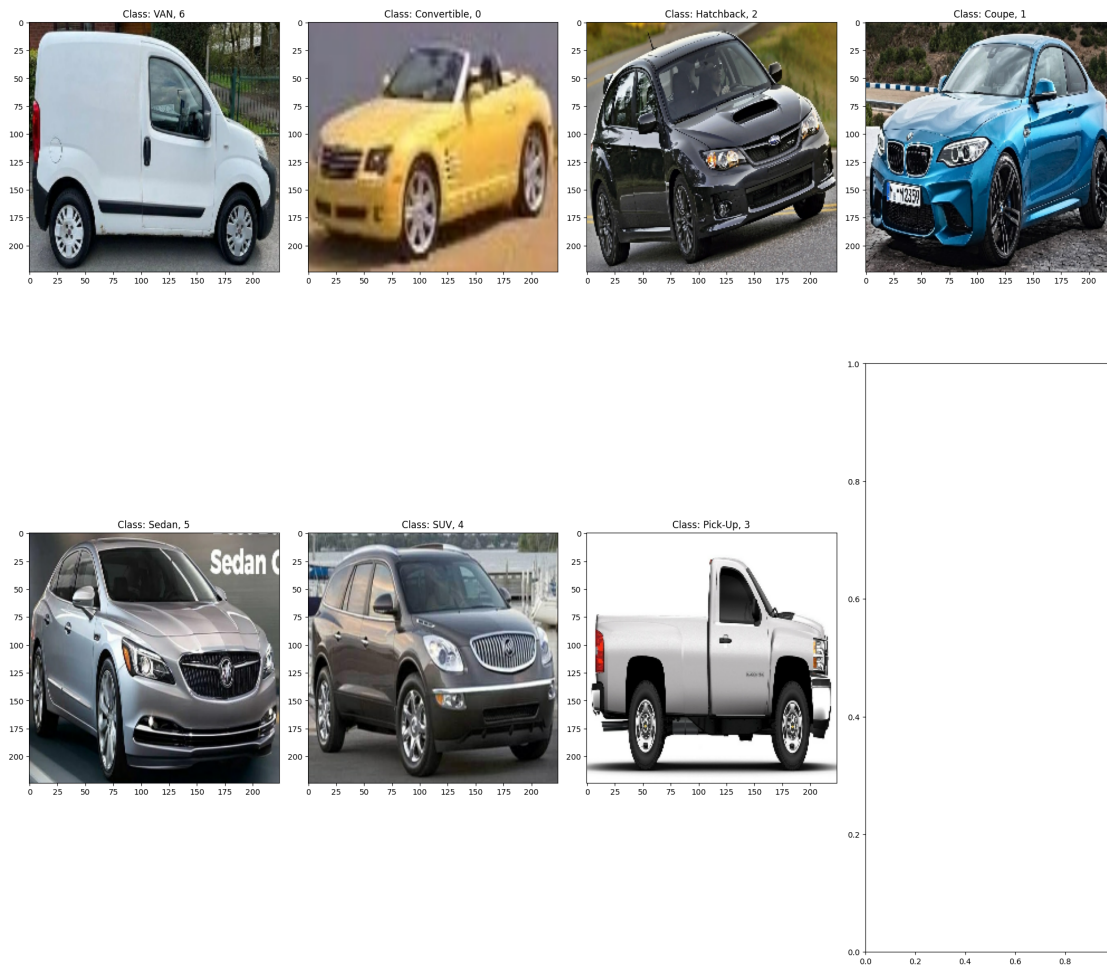
count = 0
while count < num_classes:
    batch = next(data_iterator)

    for idx, img in enumerate(batch[0]):
        label = batch[1][idx]
        if label not in plotted:
            ax_idx = count if nrows == 1 or ncols == 1 else (count // ncols,
↪count % ncols)
            ax[ax_idx].imshow(img.astype(int))
            ax[ax_idx].title.set_text(f"Class: {class_names[label]}, {label}")
            plotted.add(label)
            count += 1

    if count == num_classes:
        break

plt.tight_layout()
plt.show()

```



```
[7]: base_model = EfficientNetB7(
      weights='imagenet',
      include_top=False,
      input_shape=(224, 224, 3)
    )
    base_model.summary()
```

Model: "efficientnetb7"

Layer (type)	Output Shape	Param #	Connected to
input_1 (InputLayer)	[(None, 224, 224, 3)]	0	[]
rescaling (Rescaling) ['input_1[0][0]']	(None, 224, 224, 3)	0	
normalization (Normalization) ['rescaling[0][0]']	(None, 224, 224, 3)	7	
rescaling_1 (Rescaling) ['normalization[0][0]']	(None, 224, 224, 3)	0	
stem_conv_pad (ZeroPadding2D) ['rescaling_1[0][0]']	(None, 225, 225, 3)	0	
stem_conv (Conv2D) ['stem_conv_pad[0][0]']	(None, 112, 112, 64)	1728	
stem_bn (BatchNormalization) ['stem_conv[0][0]']	(None, 112, 112, 64)	256	
stem_activation (Activation) ['stem_bn[0][0]']	(None, 112, 112, 64)	0	
block1a_dwconv (DepthwiseConv2D) ['stem_activation[0][0]']	(None, 112, 112, 64)	576	
block1a_bn (BatchNormalization)	(None, 112, 112, 64)	256	

```

['block1a_dwconv[0][0]']
)

block1a_activation (Activation (None, 112, 112, 64 0
['block1a_bn[0][0]']
)

block1a_se_squeeze (GlobalAver (None, 64) 0
['block1a_activation[0][0]']
agePooling2D)

block1a_se_reshape (Reshape) (None, 1, 1, 64) 0
['block1a_se_squeeze[0][0]']

block1a_se_reduce (Conv2D) (None, 1, 1, 16) 1040
['block1a_se_reshape[0][0]']

block1a_se_expand (Conv2D) (None, 1, 1, 64) 1088
['block1a_se_reduce[0][0]']

block1a_se_excite (Multiply) (None, 112, 112, 64 0
['block1a_activation[0][0]',
)
['block1a_se_expand[0][0]']

block1a_project_conv (Conv2D) (None, 112, 112, 32 2048
['block1a_se_excite[0][0]']
)

block1a_project_bn (BatchNorma (None, 112, 112, 32 128
['block1a_project_conv[0][0]']
lization)
)

block1b_dwconv (DepthwiseConv2 (None, 112, 112, 32 288
['block1a_project_bn[0][0]']
D)
)

block1b_bn (BatchNormalization (None, 112, 112, 32 128
['block1b_dwconv[0][0]']
)
)

block1b_activation (Activation (None, 112, 112, 32 0
['block1b_bn[0][0]']
)
)

block1b_se_squeeze (GlobalAver (None, 32) 0
['block1b_activation[0][0]']
agePooling2D)

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```

    block1b_se_reshape (Reshape)      (None, 1, 1, 32)      0
['block1b_se_squeeze[0][0]']

    block1b_se_reduce (Conv2D)        (None, 1, 1, 8)      264
['block1b_se_reshape[0][0]']

    block1b_se_expand (Conv2D)        (None, 1, 1, 32)      288
['block1b_se_reduce[0][0]']

    block1b_se_excite (Multiply)      (None, 112, 112, 32  0
['block1b_activation[0][0]',
    )
'block1b_se_expand[0][0]']

    block1b_project_conv (Conv2D)     (None, 112, 112, 32  1024
['block1b_se_excite[0][0]']
    )

    block1b_project_bn (BatchNorma   (None, 112, 112, 32  128
['block1b_project_conv[0][0]']
    lization)
    )

    block1b_drop (Dropout)            (None, 112, 112, 32  0
['block1b_project_bn[0][0]']
    )

    block1b_add (Add)                 (None, 112, 112, 32  0
['block1b_drop[0][0]',
    )
'block1a_project_bn[0][0]']

    block1c_dwconv (DepthwiseConv2   (None, 112, 112, 32  288
['block1b_add[0][0]']
    D)
    )

    block1c_bn (BatchNormalization   (None, 112, 112, 32  128
['block1c_dwconv[0][0]']
    )
    )

    block1c_activation (Activation)   (None, 112, 112, 32  0
['block1c_bn[0][0]']
    )

    block1c_se_squeeze (GlobalAver    (None, 32)            0
['block1c_activation[0][0]']
    agePooling2D)

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```

    block1c_se_reshape (Reshape)      (None, 1, 1, 32)      0
['block1c_se_squeeze[0][0]']

    block1c_se_reduce (Conv2D)        (None, 1, 1, 8)      264
['block1c_se_reshape[0][0]']

    block1c_se_expand (Conv2D)        (None, 1, 1, 32)      288
['block1c_se_reduce[0][0]']

    block1c_se_excite (Multiply)      (None, 112, 112, 32  0
['block1c_activation[0][0]',
    )
'block1c_se_expand[0][0]']

    block1c_project_conv (Conv2D)     (None, 112, 112, 32  1024
['block1c_se_excite[0][0]']
    )

    block1c_project_bn (BatchNorma    (None, 112, 112, 32  128
['block1c_project_conv[0][0]']
    lization)
    )

    block1c_drop (Dropout)            (None, 112, 112, 32  0
['block1c_project_bn[0][0]']
    )

    block1c_add (Add)                 (None, 112, 112, 32  0
['block1c_drop[0][0]',
    )
'block1b_add[0][0]']

    block1d_dwconv (DepthwiseConv2   (None, 112, 112, 32  288
['block1c_add[0][0]']
    D)
    )

    block1d_bn (BatchNormalization   (None, 112, 112, 32  128
['block1d_dwconv[0][0]']
    )
    )

    block1d_activation (Activation)   (None, 112, 112, 32  0
['block1d_bn[0][0]']
    )
    )

    block1d_se_squeeze (GlobalAver    (None, 32)            0
['block1d_activation[0][0]']
    agePooling2D)

    block1d_se_reshape (Reshape)      (None, 1, 1, 32)      0

```

```

['block1d_se_squeeze[0][0]']

    block1d_se_reduce (Conv2D)      (None, 1, 1, 8)      264
['block1d_se_reshape[0][0]']

    block1d_se_expand (Conv2D)      (None, 1, 1, 32)     288
['block1d_se_reduce[0][0]']

    block1d_se_excite (Multiply)    (None, 112, 112, 32  0
['block1d_activation[0][0]',
    )
['block1d_se_expand[0][0]']

    block1d_project_conv (Conv2D)   (None, 112, 112, 32  1024
['block1d_se_excite[0][0]']
    )

    block1d_project_bn (BatchNorma  (None, 112, 112, 32  128
['block1d_project_conv[0][0]']
    lization)
    )

    block1d_drop (Dropout)          (None, 112, 112, 32  0
['block1d_project_bn[0][0]']
    )

    block1d_add (Add)               (None, 112, 112, 32  0
['block1d_drop[0][0]',
    )
['block1c_add[0][0]']

    block2a_expand_conv (Conv2D)    (None, 112, 112, 19  6144
['block1d_add[0][0]']
    2)

    block2a_expand_bn (BatchNormal  (None, 112, 112, 19  768
['block2a_expand_conv[0][0]']
    ization)
    2)

    block2a_expand_activation (Act  (None, 112, 112, 19  0
['block2a_expand_bn[0][0]']
    ivation)
    2)

    block2a_dwconv_pad (ZeroPaddin  (None, 113, 113, 19  0
['block2a_expand_activation[0][0]
    g2D)
    2)
    ']'

    block2a_dwconv (DepthwiseConv2  (None, 56, 56, 192)  1728
['block2a_dwconv_pad[0][0]']

```


D)

```
block2a_bn (BatchNormalization (None, 56, 56, 192) 768  
['block2a_dwconv[0][0]']  
)
```

```
block2a_activation (Activation (None, 56, 56, 192) 0  
['block2a_bn[0][0]']  
)
```

```
block2a_se_squeeze (GlobalAveragePooling2D) (None, 192) 0  
['block2a_activation[0][0]']  
agePooling2D)
```

```
block2a_se_reshape (Reshape) (None, 1, 1, 192) 0  
['block2a_se_squeeze[0][0]']
```

```
block2a_se_reduce (Conv2D) (None, 1, 1, 8) 1544  
['block2a_se_reshape[0][0]']
```

```
block2a_se_expand (Conv2D) (None, 1, 1, 192) 1728  
['block2a_se_reduce[0][0]']
```

```
block2a_se_excite (Multiply) (None, 56, 56, 192) 0  
['block2a_activation[0][0]',  
'block2a_se_expand[0][0]']
```

```
block2a_project_conv (Conv2D) (None, 56, 56, 48) 9216  
['block2a_se_excite[0][0]']
```

```
block2a_project_bn (BatchNormalization) (None, 56, 56, 48) 192  
['block2a_project_conv[0][0]']  
lization)
```

```
block2b_expand_conv (Conv2D) (None, 56, 56, 288) 13824  
['block2a_project_bn[0][0]']
```

```
block2b_expand_bn (BatchNormalization) (None, 56, 56, 288) 1152  
['block2b_expand_conv[0][0]']  
ization)
```

```
block2b_expand_activation (Activation) (None, 56, 56, 288) 0  
['block2b_expand_bn[0][0]']  
ivation)
```

```
block2b_dwconv (DepthwiseConv2D) (None, 56, 56, 288) 2592  
['block2b_expand_activation[0][0]']
```

D)

']

```

    block2b_bn (BatchNormalization (None, 56, 56, 288) 1152
['block2b_dwconv[0][0]']
)

    block2b_activation (Activation (None, 56, 56, 288) 0
['block2b_bn[0][0]']
)

    block2b_se_squeeze (GlobalAveragePooling2D) (None, 288) 0
['block2b_activation[0][0]']

    block2b_se_reshape (Reshape) (None, 1, 1, 288) 0
['block2b_se_squeeze[0][0]']

    block2b_se_reduce (Conv2D) (None, 1, 1, 12) 3468
['block2b_se_reshape[0][0]']

    block2b_se_expand (Conv2D) (None, 1, 1, 288) 3744
['block2b_se_reduce[0][0]']

    block2b_se_excite (Multiply) (None, 56, 56, 288) 0
['block2b_activation[0][0]',
'block2b_se_expand[0][0]']

    block2b_project_conv (Conv2D) (None, 56, 56, 48) 13824
['block2b_se_excite[0][0]']

    block2b_project_bn (BatchNormalization) (None, 56, 56, 48) 192
['block2b_project_conv[0][0]']

    block2b_drop (Dropout) (None, 56, 56, 48) 0
['block2b_project_bn[0][0]']

    block2b_add (Add) (None, 56, 56, 48) 0
['block2b_drop[0][0]',
'block2a_project_bn[0][0]']

    block2c_expand_conv (Conv2D) (None, 56, 56, 288) 13824
['block2b_add[0][0]']

    block2c_expand_bn (BatchNormalization) (None, 56, 56, 288) 1152
['block2c_expand_conv[0][0]']

    block2c_expand_activation (Activation) (None, 56, 56, 288) 0

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['block2c_expand_bn[0][0]']
ivation)

block2c_dwconv (DepthwiseConv2 (None, 56, 56, 288) 2592
['block2c_expand_activation[0][0]
D)

block2c_bn (BatchNormalization (None, 56, 56, 288) 1152
['block2c_dwconv[0][0]']
)

block2c_activation (Activation (None, 56, 56, 288) 0
['block2c_bn[0][0]']
)

block2c_se_squeeze (GlobalAver (None, 288) 0
['block2c_activation[0][0]']
agePooling2D)

block2c_se_reshape (Reshape) (None, 1, 1, 288) 0
['block2c_se_squeeze[0][0]']

block2c_se_reduce (Conv2D) (None, 1, 1, 12) 3468
['block2c_se_reshape[0][0]']

block2c_se_expand (Conv2D) (None, 1, 1, 288) 3744
['block2c_se_reduce[0][0]']

block2c_se_excite (Multiply) (None, 56, 56, 288) 0
['block2c_activation[0][0]',
'block2c_se_expand[0][0]']

block2c_project_conv (Conv2D) (None, 56, 56, 48) 13824
['block2c_se_excite[0][0]']

block2c_project_bn (BatchNorma (None, 56, 56, 48) 192
['block2c_project_conv[0][0]']
lization)

block2c_drop (Dropout) (None, 56, 56, 48) 0
['block2c_project_bn[0][0]']

block2c_add (Add) (None, 56, 56, 48) 0
['block2c_drop[0][0]',
'block2b_add[0][0]']

block2d_expand_conv (Conv2D) (None, 56, 56, 288) 13824
['block2c_add[0][0]']

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block2d_expand_bn (BatchNormal (None, 56, 56, 288) 1152
['block2d_expand_conv[0][0]']
ization)

block2d_expand_activation (Act (None, 56, 56, 288) 0
['block2d_expand_bn[0][0]']
ivation)

block2d_dwconv (DepthwiseConv2 (None, 56, 56, 288) 2592
['block2d_expand_activation[0][0]
D)

block2d_bn (BatchNormalization (None, 56, 56, 288) 1152
['block2d_dwconv[0][0]']
)

block2d_activation (Activation (None, 56, 56, 288) 0
['block2d_bn[0][0]']
)

block2d_se_squeeze (GlobalAver (None, 288) 0
['block2d_activation[0][0]']
agePooling2D)

block2d_se_reshape (Reshape) (None, 1, 1, 288) 0
['block2d_se_squeeze[0][0]']

block2d_se_reduce (Conv2D) (None, 1, 1, 12) 3468
['block2d_se_reshape[0][0]']

block2d_se_expand (Conv2D) (None, 1, 1, 288) 3744
['block2d_se_reduce[0][0]']

block2d_se_excite (Multiply) (None, 56, 56, 288) 0
['block2d_activation[0][0]',
'block2d_se_expand[0][0]']

block2d_project_conv (Conv2D) (None, 56, 56, 48) 13824
['block2d_se_excite[0][0]']

block2d_project_bn (BatchNorma (None, 56, 56, 48) 192
['block2d_project_conv[0][0]']
lization)

block2d_drop (Dropout) (None, 56, 56, 48) 0
['block2d_project_bn[0][0]']

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    block2d_add (Add) (None, 56, 56, 48) 0
['block2d_drop[0][0]',
'block2c_add[0][0]']

    block2e_expand_conv (Conv2D) (None, 56, 56, 288) 13824
['block2d_add[0][0]']

    block2e_expand_bn (BatchNormal (None, 56, 56, 288) 1152
['block2e_expand_conv[0][0]'
ization)

    block2e_expand_activation (Act (None, 56, 56, 288) 0
['block2e_expand_bn[0][0]'
ivation)

    block2e_dwconv (DepthwiseConv2 (None, 56, 56, 288) 2592
['block2e_expand_activation[0][0]
D)

    block2e_bn (BatchNormalization (None, 56, 56, 288) 1152
['block2e_dwconv[0][0]']
)

    block2e_activation (Activation (None, 56, 56, 288) 0
['block2e_bn[0][0]']
)

    block2e_se_squeeze (GlobalAver (None, 288) 0
['block2e_activation[0][0]']
agePooling2D)

    block2e_se_reshape (Reshape) (None, 1, 1, 288) 0
['block2e_se_squeeze[0][0]']

    block2e_se_reduce (Conv2D) (None, 1, 1, 12) 3468
['block2e_se_reshape[0][0]']

    block2e_se_expand (Conv2D) (None, 1, 1, 288) 3744
['block2e_se_reduce[0][0]']

    block2e_se_excite (Multiply) (None, 56, 56, 288) 0
['block2e_activation[0][0]',
'block2e_se_expand[0][0]']

    block2e_project_conv (Conv2D) (None, 56, 56, 48) 13824
['block2e_se_excite[0][0]']

    block2e_project_bn (BatchNorma (None, 56, 56, 48) 192

```

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['block2e_project_conv[0][0]']
lization)

block2e_drop (Dropout)          (None, 56, 56, 48)  0
['block2e_project_bn[0][0]']

block2e_add (Add)                (None, 56, 56, 48)  0
['block2e_drop[0][0]',
'block2d_add[0][0]']

block2f_expand_conv (Conv2D)     (None, 56, 56, 288) 13824
['block2e_add[0][0]']

block2f_expand_bn (BatchNormal   (None, 56, 56, 288) 1152
['block2f_expand_conv[0][0]']
ization)

block2f_expand_activation (Act   (None, 56, 56, 288)  0
['block2f_expand_bn[0][0]']
ivation)

block2f_dwconv (DepthwiseConv2   (None, 56, 56, 288) 2592
['block2f_expand_activation[0][0]
D)

block2f_bn (BatchNormalization   (None, 56, 56, 288) 1152
['block2f_dwconv[0][0]']
)

block2f_activation (Activation   (None, 56, 56, 288)  0
['block2f_bn[0][0]']
)

block2f_se_squeeze (GlobalAver   (None, 288)          0
['block2f_activation[0][0]']
agePooling2D)

block2f_se_reshape (Reshape)     (None, 1, 1, 288)   0
['block2f_se_squeeze[0][0]']

block2f_se_reduce (Conv2D)       (None, 1, 1, 12)    3468
['block2f_se_reshape[0][0]']

block2f_se_expand (Conv2D)       (None, 1, 1, 288)   3744
['block2f_se_reduce[0][0]']

block2f_se_excite (Multiply)     (None, 56, 56, 288)  0
['block2f_activation[0][0]',

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```

'block2f_se_expand[0][0]']

block2f_project_conv (Conv2D) (None, 56, 56, 48) 13824
['block2f_se_excite[0][0]']

block2f_project_bn (BatchNormal (None, 56, 56, 48) 192
['block2f_project_conv[0][0]']
ization)

block2f_drop (Dropout) (None, 56, 56, 48) 0
['block2f_project_bn[0][0]']

block2f_add (Add) (None, 56, 56, 48) 0
['block2f_drop[0][0]',
'block2e_add[0][0]']

block2g_expand_conv (Conv2D) (None, 56, 56, 288) 13824
['block2f_add[0][0]']

block2g_expand_bn (BatchNormal (None, 56, 56, 288) 1152
['block2g_expand_conv[0][0]']
ization)

block2g_expand_activation (Act (None, 56, 56, 288) 0
['block2g_expand_bn[0][0]']
ivation)

block2g_dwconv (DepthwiseConv2 (None, 56, 56, 288) 2592
['block2g_expand_activation[0][0]
D)

block2g_bn (BatchNormalization (None, 56, 56, 288) 1152
['block2g_dwconv[0][0]']
)

block2g_activation (Activation (None, 56, 56, 288) 0
['block2g_bn[0][0]']
)

block2g_se_squeeze (GlobalAver (None, 288) 0
['block2g_activation[0][0]']
agePooling2D)

block2g_se_reshape (Reshape) (None, 1, 1, 288) 0
['block2g_se_squeeze[0][0]']

block2g_se_reduce (Conv2D) (None, 1, 1, 12) 3468
['block2g_se_reshape[0][0]']

```

block2g_se_expand (Conv2D)	(None, 1, 1, 288)	3744
['block2g_se_reduce[0][0]']		
block2g_se_excite (Multiply)	(None, 56, 56, 288)	0
['block2g_activation[0][0]', 'block2g_se_expand[0][0]']		
block2g_project_conv (Conv2D)	(None, 56, 56, 48)	13824
['block2g_se_excite[0][0]']		
block2g_project_bn (BatchNormal	(None, 56, 56, 48)	192
['block2g_project_conv[0][0]'] lization)		
block2g_drop (Dropout)	(None, 56, 56, 48)	0
['block2g_project_bn[0][0]']		
block2g_add (Add)	(None, 56, 56, 48)	0
['block2g_drop[0][0]', 'block2f_add[0][0]']		
block3a_expand_conv (Conv2D)	(None, 56, 56, 288)	13824
['block2g_add[0][0]']		
block3a_expand_bn (BatchNormal	(None, 56, 56, 288)	1152
['block3a_expand_conv[0][0]'] lization)		
block3a_expand_activation (Act	(None, 56, 56, 288)	0
['block3a_expand_bn[0][0]'] ivation)		
block3a_dwconv_pad (ZeroPaddin	(None, 59, 59, 288)	0
['block3a_expand_activation[0][0]'] g2D)		
block3a_dwconv (DepthwiseConv2	(None, 28, 28, 288)	7200
['block3a_dwconv_pad[0][0]'] D)		
block3a_bn (BatchNormalization	(None, 28, 28, 288)	1152
['block3a_dwconv[0][0]'])		
block3a_activation (Activation	(None, 28, 28, 288)	0
['block3a_bn[0][0]'])		

block3a_se_squeeze (GlobalAveragePooling2D)	(None, 288)	0
['block3a_activation[0][0]']		
block3a_se_reshape (Reshape)	(None, 1, 1, 288)	0
['block3a_se_squeeze[0][0]']		
block3a_se_reduce (Conv2D)	(None, 1, 1, 12)	3468
['block3a_se_reshape[0][0]']		
block3a_se_expand (Conv2D)	(None, 1, 1, 288)	3744
['block3a_se_reduce[0][0]']		
block3a_se_excite (Multiply)	(None, 28, 28, 288)	0
['block3a_activation[0][0]', 'block3a_se_expand[0][0]']		
block3a_project_conv (Conv2D)	(None, 28, 28, 80)	23040
['block3a_se_excite[0][0]']		
block3a_project_bn (BatchNormalization)	(None, 28, 28, 80)	320
['block3a_project_conv[0][0]']		
block3b_expand_conv (Conv2D)	(None, 28, 28, 480)	38400
['block3a_project_bn[0][0]']		
block3b_expand_bn (BatchNormalization)	(None, 28, 28, 480)	1920
['block3b_expand_conv[0][0]']		
block3b_expand_activation (Activation)	(None, 28, 28, 480)	0
['block3b_expand_bn[0][0]']		
block3b_dwconv (DepthwiseConv2D)	(None, 28, 28, 480)	12000
['block3b_expand_activation[0][0]']		
block3b_bn (BatchNormalization)	(None, 28, 28, 480)	1920
['block3b_dwconv[0][0]']		
block3b_activation (Activation)	(None, 28, 28, 480)	0
['block3b_bn[0][0]']		

block3b_se_squeeze (GlobalAveragePooling2D)	(None, 480)	0
['block3b_activation[0][0]']		
block3b_se_reshape (Reshape)	(None, 1, 1, 480)	0
['block3b_se_squeeze[0][0]']		
block3b_se_reduce (Conv2D)	(None, 1, 1, 20)	9620
['block3b_se_reshape[0][0]']		
block3b_se_expand (Conv2D)	(None, 1, 1, 480)	10080
['block3b_se_reduce[0][0]']		
block3b_se_excite (Multiply)	(None, 28, 28, 480)	0
['block3b_activation[0][0]', 'block3b_se_expand[0][0]']		
block3b_project_conv (Conv2D)	(None, 28, 28, 80)	38400
['block3b_se_excite[0][0]']		
block3b_project_bn (BatchNormalization)	(None, 28, 28, 80)	320
['block3b_project_conv[0][0]']		
block3b_drop (Dropout)	(None, 28, 28, 80)	0
['block3b_project_bn[0][0]']		
block3b_add (Add)	(None, 28, 28, 80)	0
['block3b_drop[0][0]', 'block3a_project_bn[0][0]']		
block3c_expand_conv (Conv2D)	(None, 28, 28, 480)	38400
['block3b_add[0][0]']		
block3c_expand_bn (BatchNormalization)	(None, 28, 28, 480)	1920
['block3c_expand_conv[0][0]']		
block3c_expand_activation (Activation)	(None, 28, 28, 480)	0
['block3c_expand_bn[0][0]']		
block3c_dwconv (DepthwiseConv2D)	(None, 28, 28, 480)	12000
['block3c_expand_activation[0][0]']		
block3c_bn (BatchNormalization)	(None, 28, 28, 480)	1920
['block3c_dwconv[0][0]']		

```

)

block3c_activation (Activation (None, 28, 28, 480) 0
['block3c_bn[0][0]'])
)

block3c_se_squeeze (GlobalAveragePooling2D) (None, 480) 0
['block3c_activation[0][0]']

block3c_se_reshape (Reshape) (None, 1, 1, 480) 0
['block3c_se_squeeze[0][0]']

block3c_se_reduce (Conv2D) (None, 1, 1, 20) 9620
['block3c_se_reshape[0][0]']

block3c_se_expand (Conv2D) (None, 1, 1, 480) 10080
['block3c_se_reduce[0][0]']

block3c_se_excite (Multiply) (None, 28, 28, 480) 0
['block3c_activation[0][0]',
'block3c_se_expand[0][0]']

block3c_project_conv (Conv2D) (None, 28, 28, 80) 38400
['block3c_se_excite[0][0]']

block3c_project_bn (BatchNormalization) (None, 28, 28, 80) 320
['block3c_project_conv[0][0]']

block3c_drop (Dropout) (None, 28, 28, 80) 0
['block3c_project_bn[0][0]']

block3c_add (Add) (None, 28, 28, 80) 0
['block3c_drop[0][0]',
'block3b_add[0][0]']

block3d_expand_conv (Conv2D) (None, 28, 28, 480) 38400
['block3c_add[0][0]']

block3d_expand_bn (BatchNormalization) (None, 28, 28, 480) 1920
['block3d_expand_conv[0][0]']

block3d_expand_activation (Activation) (None, 28, 28, 480) 0
['block3d_expand_bn[0][0]']

```

```

    block3d_dwconv (DepthwiseConv2 (None, 28, 28, 480) 12000
['block3d_expand_activation[0][0]
D)

    block3d_bn (BatchNormalization (None, 28, 28, 480) 1920
['block3d_dwconv[0][0]')

    block3d_activation (Activation (None, 28, 28, 480) 0
['block3d_bn[0][0]')

    block3d_se_squeeze (GlobalAveragePooling2D) (None, 480) 0
['block3d_activation[0][0]']

    block3d_se_reshape (Reshape) (None, 1, 1, 480) 0
['block3d_se_squeeze[0][0]']

    block3d_se_reduce (Conv2D) (None, 1, 1, 20) 9620
['block3d_se_reshape[0][0]']

    block3d_se_expand (Conv2D) (None, 1, 1, 480) 10080
['block3d_se_reduce[0][0]']

    block3d_se_excite (Multiply) (None, 28, 28, 480) 0
['block3d_activation[0][0]',
'block3d_se_expand[0][0]']

    block3d_project_conv (Conv2D) (None, 28, 28, 80) 38400
['block3d_se_excite[0][0]']

    block3d_project_bn (BatchNormalization) (None, 28, 28, 80) 320
['block3d_project_conv[0][0]']

    block3d_drop (Dropout) (None, 28, 28, 80) 0
['block3d_project_bn[0][0]']

    block3d_add (Add) (None, 28, 28, 80) 0
['block3d_drop[0][0]',
'block3c_add[0][0]']

    block3e_expand_conv (Conv2D) (None, 28, 28, 480) 38400
['block3d_add[0][0]']

    block3e_expand_bn (BatchNormalization) (None, 28, 28, 480) 1920
['block3e_expand_conv[0][0]']

```

```

ization)

block3e_expand_activation (Activation (None, 28, 28, 480) 0
['block3e_expand_bn[0][0]'])
ivation)

block3e_dwconv (DepthwiseConv2D (None, 28, 28, 480) 12000
['block3e_expand_activation[0][0]
D)

block3e_bn (BatchNormalization (None, 28, 28, 480) 1920
['block3e_dwconv[0][0]'])
)

block3e_activation (Activation (None, 28, 28, 480) 0
['block3e_bn[0][0]'])
)

block3e_se_squeeze (GlobalAveragePooling2D (None, 480) 0
['block3e_activation[0][0]'])
agePooling2D)

block3e_se_reshape (Reshape (None, 1, 1, 480) 0
['block3e_se_squeeze[0][0]'])

block3e_se_reduce (Conv2D (None, 1, 1, 20) 9620
['block3e_se_reshape[0][0]'])

block3e_se_expand (Conv2D (None, 1, 1, 480) 10080
['block3e_se_reduce[0][0]'])

block3e_se_excite (Multiply (None, 28, 28, 480) 0
['block3e_activation[0][0]',
'block3e_se_expand[0][0]'])

block3e_project_conv (Conv2D (None, 28, 28, 80) 38400
['block3e_se_excite[0][0]'])

block3e_project_bn (BatchNormalization (None, 28, 28, 80) 320
['block3e_project_conv[0][0]'])
lization)

block3e_drop (Dropout (None, 28, 28, 80) 0
['block3e_project_bn[0][0]'])

block3e_add (Add (None, 28, 28, 80) 0
['block3e_drop[0][0]',
'block3d_add[0][0]'])

```

```

    block3f_expand_conv (Conv2D)      (None, 28, 28, 480)  38400
['block3e_add[0][0]']

    block3f_expand_bn (BatchNormal    (None, 28, 28, 480)  1920
['block3f_expand_conv[0][0]']
    ization)

    block3f_expand_activation (Act     (None, 28, 28, 480)  0
['block3f_expand_bn[0][0]']
    ivation)

    block3f_dwconv (DepthwiseConv2    (None, 28, 28, 480)  12000
['block3f_expand_activation[0][0]
    D)

    block3f_bn (BatchNormalization    (None, 28, 28, 480)  1920
['block3f_dwconv[0][0]']
    )

    block3f_activation (Activation     (None, 28, 28, 480)  0
['block3f_bn[0][0]']
    )

    block3f_se_squeeze (GlobalAver     (None, 480)          0
['block3f_activation[0][0]']
    agePooling2D)

    block3f_se_reshape (Reshape)       (None, 1, 1, 480)    0
['block3f_se_squeeze[0][0]']

    block3f_se_reduce (Conv2D)         (None, 1, 1, 20)     9620
['block3f_se_reshape[0][0]']

    block3f_se_expand (Conv2D)         (None, 1, 1, 480)    10080
['block3f_se_reduce[0][0]']

    block3f_se_excite (Multiply)       (None, 28, 28, 480)  0
['block3f_activation[0][0]',
'block3f_se_expand[0][0]']

    block3f_project_conv (Conv2D)      (None, 28, 28, 80)   38400
['block3f_se_excite[0][0]']

    block3f_project_bn (BatchNorma     (None, 28, 28, 80)   320
['block3f_project_conv[0][0]']
    lization)

```

```

    block3f_drop (Dropout)          (None, 28, 28, 80)    0
['block3f_project_bn[0][0]']

    block3f_add (Add)                (None, 28, 28, 80)    0
['block3f_drop[0][0]',
'block3e_add[0][0]']

    block3g_expand_conv (Conv2D)     (None, 28, 28, 480) 38400
['block3f_add[0][0]']

    block3g_expand_bn (BatchNormal   (None, 28, 28, 480) 1920
['block3g_expand_conv[0][0]']
ization)

    block3g_expand_activation (Act    (None, 28, 28, 480) 0
['block3g_expand_bn[0][0]']
ivation)

    block3g_dwconv (DepthwiseConv2   (None, 28, 28, 480) 12000
['block3g_expand_activation[0][0]
D)

    block3g_bn (BatchNormalization   (None, 28, 28, 480) 1920
['block3g_dwconv[0][0]']
)

    block3g_activation (Activation    (None, 28, 28, 480) 0
['block3g_bn[0][0]']
)

    block3g_se_squeeze (GlobalAver    (None, 480)          0
['block3g_activation[0][0]']
agePooling2D)

    block3g_se_reshape (Reshape)      (None, 1, 1, 480)    0
['block3g_se_squeeze[0][0]']

    block3g_se_reduce (Conv2D)        (None, 1, 1, 20)     9620
['block3g_se_reshape[0][0]']

    block3g_se_expand (Conv2D)        (None, 1, 1, 480)    10080
['block3g_se_reduce[0][0]']

    block3g_se_excite (Multiply)      (None, 28, 28, 480) 0
['block3g_activation[0][0]',
'block3g_se_expand[0][0]']

    block3g_project_conv (Conv2D)     (None, 28, 28, 80)   38400

```

```

['block3g_se_excite[0][0]']

block3g_project_bn (BatchNormal (None, 28, 28, 80) 320
['block3g_project_conv[0][0]']
lization)

block3g_drop (Dropout) (None, 28, 28, 80) 0
['block3g_project_bn[0][0]']

block3g_add (Add) (None, 28, 28, 80) 0
['block3g_drop[0][0]',
'block3f_add[0][0]']

block4a_expand_conv (Conv2D) (None, 28, 28, 480) 38400
['block3g_add[0][0]']

block4a_expand_bn (BatchNormal (None, 28, 28, 480) 1920
['block4a_expand_conv[0][0]']
lization)

block4a_expand_activation (Act (None, 28, 28, 480) 0
['block4a_expand_bn[0][0]']
ivation)

block4a_dwconv_pad (ZeroPaddin (None, 29, 29, 480) 0
['block4a_expand_activation[0][0]
g2D)

block4a_dwconv (DepthwiseConv2 (None, 14, 14, 480) 4320
['block4a_dwconv_pad[0][0]']
D)

block4a_bn (BatchNormalization (None, 14, 14, 480) 1920
['block4a_dwconv[0][0]']
)

block4a_activation (Activation (None, 14, 14, 480) 0
['block4a_bn[0][0]']
)

block4a_se_squeeze (GlobalAver (None, 480) 0
['block4a_activation[0][0]']
agePooling2D)

block4a_se_reshape (Reshape) (None, 1, 1, 480) 0
['block4a_se_squeeze[0][0]']

block4a_se_reduce (Conv2D) (None, 1, 1, 20) 9620

```



```

['block4a_se_reshape[0][0]']

block4a_se_expand (Conv2D)      (None, 1, 1, 480)    10080
['block4a_se_reduce[0][0]']

block4a_se_excite (Multiply)    (None, 14, 14, 480)  0
['block4a_activation[0][0]',
'block4a_se_expand[0][0]']

block4a_project_conv (Conv2D)   (None, 14, 14, 160)  76800
['block4a_se_excite[0][0]']

block4a_project_bn (BatchNorma  (None, 14, 14, 160)  640
['block4a_project_conv[0][0]']
lization)

block4b_expand_conv (Conv2D)    (None, 14, 14, 960)  153600
['block4a_project_bn[0][0]']

block4b_expand_bn (BatchNormal  (None, 14, 14, 960)  3840
['block4b_expand_conv[0][0]']
ization)

block4b_expand_activation (Act  (None, 14, 14, 960)  0
['block4b_expand_bn[0][0]']
ivation)

block4b_dwconv (DepthwiseConv2  (None, 14, 14, 960)  8640
['block4b_expand_activation[0][0]
D)

block4b_bn (BatchNormalization  (None, 14, 14, 960)  3840
['block4b_dwconv[0][0]']
)

block4b_activation (Activation  (None, 14, 14, 960)  0
['block4b_bn[0][0]']
)

block4b_se_squeeze (GlobalAver  (None, 960)          0
['block4b_activation[0][0]']
agePooling2D)

block4b_se_reshape (Reshape)    (None, 1, 1, 960)    0
['block4b_se_squeeze[0][0]']

block4b_se_reduce (Conv2D)      (None, 1, 1, 40)     38440
['block4b_se_reshape[0][0]']

```

```

    block4b_se_expand (Conv2D)      (None, 1, 1, 960)    39360
['block4b_se_reduce[0][0]']

    block4b_se_excite (Multiply)    (None, 14, 14, 960)  0
['block4b_activation[0][0]',
'block4b_se_expand[0][0]']

    block4b_project_conv (Conv2D)   (None, 14, 14, 160)  153600
['block4b_se_excite[0][0]']

    block4b_project_bn (BatchNorma  (None, 14, 14, 160)  640
['block4b_project_conv[0][0]']
lization)

    block4b_drop (Dropout)          (None, 14, 14, 160)  0
['block4b_project_bn[0][0]']

    block4b_add (Add)               (None, 14, 14, 160)  0
['block4b_drop[0][0]',
'block4a_project_bn[0][0]']

    block4c_expand_conv (Conv2D)    (None, 14, 14, 960)  153600
['block4b_add[0][0]']

    block4c_expand_bn (BatchNormal  (None, 14, 14, 960)  3840
['block4c_expand_conv[0][0]']
lization)

    block4c_expand_activation (Act  (None, 14, 14, 960)  0
['block4c_expand_bn[0][0]']
ivation)

    block4c_dwconv (DepthwiseConv2  (None, 14, 14, 960)  8640
['block4c_expand_activation[0][0]
D)

    block4c_bn (BatchNormalization  (None, 14, 14, 960)  3840
['block4c_dwconv[0][0]']
)

    block4c_activation (Activation  (None, 14, 14, 960)  0
['block4c_bn[0][0]']
)

    block4c_se_squeeze (GlobalAver  (None, 960)          0
['block4c_activation[0][0]']
agePooling2D)

```

block4c_se_reshape (Reshape)	(None, 1, 1, 960)	0
['block4c_se_squeeze[0][0]']		
block4c_se_reduce (Conv2D)	(None, 1, 1, 40)	38440
['block4c_se_reshape[0][0]']		
block4c_se_expand (Conv2D)	(None, 1, 1, 960)	39360
['block4c_se_reduce[0][0]']		
block4c_se_excite (Multiply)	(None, 14, 14, 960)	0
['block4c_activation[0][0]', 'block4c_se_expand[0][0]']		
block4c_project_conv (Conv2D)	(None, 14, 14, 160)	153600
['block4c_se_excite[0][0]']		
block4c_project_bn (BatchNormal	(None, 14, 14, 160)	640
['block4c_project_conv[0][0]'] lization)		
block4c_drop (Dropout)	(None, 14, 14, 160)	0
['block4c_project_bn[0][0]']		
block4c_add (Add)	(None, 14, 14, 160)	0
['block4c_drop[0][0]', 'block4b_add[0][0]']		
block4d_expand_conv (Conv2D)	(None, 14, 14, 960)	153600
['block4c_add[0][0]']		
block4d_expand_bn (BatchNormal	(None, 14, 14, 960)	3840
['block4d_expand_conv[0][0]'] ization)		
block4d_expand_activation (Act	(None, 14, 14, 960)	0
['block4d_expand_bn[0][0]'] ivation)		
block4d_dwconv (DepthwiseConv2	(None, 14, 14, 960)	8640
['block4d_expand_activation[0][0]'] D)		
block4d_bn (BatchNormalization	(None, 14, 14, 960)	3840
['block4d_dwconv[0][0]'])		
block4d_activation (Activation	(None, 14, 14, 960)	0

```

['block4d_bn[0][0]']
)

block4d_se_squeeze (GlobalAveragePooling2D) (None, 960) 0
['block4d_activation[0][0]']

block4d_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4d_se_squeeze[0][0]']

block4d_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4d_se_reshape[0][0]']

block4d_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block4d_se_reduce[0][0]']

block4d_se_excite (Multiply) (None, 14, 14, 960) 0
['block4d_activation[0][0]',
'block4d_se_expand[0][0]']

block4d_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4d_se_excite[0][0]']

block4d_project_bn (BatchNormalization) (None, 14, 14, 160) 640
['block4d_project_conv[0][0]']

block4d_drop (Dropout) (None, 14, 14, 160) 0
['block4d_project_bn[0][0]']

block4d_add (Add) (None, 14, 14, 160) 0
['block4d_drop[0][0]',
'block4c_add[0][0]']

block4e_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block4d_add[0][0]']

block4e_expand_bn (BatchNormalization) (None, 14, 14, 960) 3840
['block4e_expand_conv[0][0]']

block4e_expand_activation (Activation) (None, 14, 14, 960) 0
['block4e_expand_bn[0][0]']

block4e_dwconv (DepthwiseConv2D) (None, 14, 14, 960) 8640
['block4e_expand_activation[0][0]']
D)
']

```

```

    block4e_bn (BatchNormalization (None, 14, 14, 960) 3840
['block4e_dwconv[0][0]']
)

    block4e_activation (Activation (None, 14, 14, 960) 0
['block4e_bn[0][0]']
)

    block4e_se_squeeze (GlobalAveragePooling2D) (None, 960) 0
['block4e_activation[0][0]']

    block4e_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4e_se_squeeze[0][0]']

    block4e_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4e_se_reshape[0][0]']

    block4e_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block4e_se_reduce[0][0]']

    block4e_se_excite (Multiply) (None, 14, 14, 960) 0
['block4e_activation[0][0]',
'block4e_se_expand[0][0]']

    block4e_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4e_se_excite[0][0]']

    block4e_project_bn (BatchNormalization) (None, 14, 14, 160) 640
['block4e_project_conv[0][0]']

    block4e_drop (Dropout) (None, 14, 14, 160) 0
['block4e_project_bn[0][0]']

    block4e_add (Add) (None, 14, 14, 160) 0
['block4e_drop[0][0]',
'block4d_add[0][0]']

    block4f_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block4e_add[0][0]']

    block4f_expand_bn (BatchNormalization) (None, 14, 14, 960) 3840
['block4f_expand_conv[0][0]']

    block4f_expand_activation (Activation) (None, 14, 14, 960) 0

```

```

['block4f_expand_bn[0][0]']
ivation)

block4f_dwconv (DepthwiseConv2 (None, 14, 14, 960) 8640
['block4f_expand_activation[0][0]
D)

block4f_bn (BatchNormalization (None, 14, 14, 960) 3840
['block4f_dwconv[0][0]']
)

block4f_activation (Activation (None, 14, 14, 960) 0
['block4f_bn[0][0]']
)

block4f_se_squeeze (GlobalAver (None, 960) 0
['block4f_activation[0][0]']
agePooling2D)

block4f_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4f_se_squeeze[0][0]']

block4f_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4f_se_reshape[0][0]']

block4f_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block4f_se_reduce[0][0]']

block4f_se_excite (Multiply) (None, 14, 14, 960) 0
['block4f_activation[0][0]',
'block4f_se_expand[0][0]']

block4f_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4f_se_excite[0][0]']

block4f_project_bn (BatchNorma (None, 14, 14, 160) 640
['block4f_project_conv[0][0]']
lization)

block4f_drop (Dropout) (None, 14, 14, 160) 0
['block4f_project_bn[0][0]']

block4f_add (Add) (None, 14, 14, 160) 0
['block4f_drop[0][0]',
'block4e_add[0][0]']

block4g_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block4f_add[0][0]']

```

```

block4g_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block4g_expand_conv[0][0]']
ization)

block4g_expand_activation (Act (None, 14, 14, 960) 0
['block4g_expand_bn[0][0]']
ivation)

block4g_dwconv (DepthwiseConv2 (None, 14, 14, 960) 8640
['block4g_expand_activation[0][0]
D)

block4g_bn (BatchNormalization (None, 14, 14, 960) 3840
['block4g_dwconv[0][0]']
)

block4g_activation (Activation (None, 14, 14, 960) 0
['block4g_bn[0][0]']
)

block4g_se_squeeze (GlobalAver (None, 960) 0
['block4g_activation[0][0]']
agePooling2D)

block4g_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4g_se_squeeze[0][0]']

block4g_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4g_se_reshape[0][0]']

block4g_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block4g_se_reduce[0][0]']

block4g_se_excite (Multiply) (None, 14, 14, 960) 0
['block4g_activation[0][0]',
'block4g_se_expand[0][0]']

block4g_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4g_se_excite[0][0]']

block4g_project_bn (BatchNorma (None, 14, 14, 160) 640
['block4g_project_conv[0][0]']
lization)

block4g_drop (Dropout) (None, 14, 14, 160) 0
['block4g_project_bn[0][0]']

```

```

    block4g_add (Add) (None, 14, 14, 160) 0
['block4g_drop[0][0]',
'block4f_add[0][0]']

    block4h_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block4g_add[0][0]']

    block4h_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block4h_expand_conv[0][0]']
ization)

    block4h_expand_activation (Act (None, 14, 14, 960) 0
['block4h_expand_bn[0][0]']
ivation)

    block4h_dwconv (DepthwiseConv2 (None, 14, 14, 960) 8640
['block4h_expand_activation[0][0]
D)

    block4h_bn (BatchNormalization (None, 14, 14, 960) 3840
['block4h_dwconv[0][0]']
)

    block4h_activation (Activation (None, 14, 14, 960) 0
['block4h_bn[0][0]']
)

    block4h_se_squeeze (GlobalAver (None, 960) 0
['block4h_activation[0][0]']
agePooling2D)

    block4h_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4h_se_squeeze[0][0]']

    block4h_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4h_se_reshape[0][0]']

    block4h_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block4h_se_reduce[0][0]']

    block4h_se_excite (Multiply) (None, 14, 14, 960) 0
['block4h_activation[0][0]',
'block4h_se_expand[0][0]']

    block4h_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4h_se_excite[0][0]']

    block4h_project_bn (BatchNorma (None, 14, 14, 160) 640

```



```

['block4h_project_conv[0][0]']
lization)

block4h_drop (Dropout)          (None, 14, 14, 160)  0
['block4h_project_bn[0][0]']

block4h_add (Add)                (None, 14, 14, 160)  0
['block4h_drop[0][0]',
'block4g_add[0][0]']

block4i_expand_conv (Conv2D)     (None, 14, 14, 960) 153600
['block4h_add[0][0]']

block4i_expand_bn (BatchNormal   (None, 14, 14, 960)  3840
['block4i_expand_conv[0][0]']
ization)

block4i_expand_activation (Act   (None, 14, 14, 960)  0
['block4i_expand_bn[0][0]']
ivation)

block4i_dwconv (DepthwiseConv2   (None, 14, 14, 960)  8640
['block4i_expand_activation[0][0]
D)

block4i_bn (BatchNormalization   (None, 14, 14, 960)  3840
['block4i_dwconv[0][0]']
)

block4i_activation (Activation   (None, 14, 14, 960)  0
['block4i_bn[0][0]']
)

block4i_se_squeeze (GlobalAver   (None, 960)          0
['block4i_activation[0][0]']
agePooling2D)

block4i_se_reshape (Reshape)     (None, 1, 1, 960)    0
['block4i_se_squeeze[0][0]']

block4i_se_reduce (Conv2D)       (None, 1, 1, 40)     38440
['block4i_se_reshape[0][0]']

block4i_se_expand (Conv2D)       (None, 1, 1, 960)    39360
['block4i_se_reduce[0][0]']

block4i_se_excite (Multiply)     (None, 14, 14, 960)  0
['block4i_activation[0][0]',

```

```

'block4i_se_expand[0][0]']

block4i_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block4i_se_excite[0][0]']

block4i_project_bn (BatchNormal (None, 14, 14, 160) 640
['block4i_project_conv[0][0]']
ization)

block4i_drop (Dropout) (None, 14, 14, 160) 0
['block4i_project_bn[0][0]']

block4i_add (Add) (None, 14, 14, 160) 0
['block4i_drop[0][0]',
'block4h_add[0][0]']

block4j_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block4i_add[0][0]']

block4j_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block4j_expand_conv[0][0]']
ization)

block4j_expand_activation (Act (None, 14, 14, 960) 0
['block4j_expand_bn[0][0]']
ivation)

block4j_dwconv (DepthwiseConv2 (None, 14, 14, 960) 8640
['block4j_expand_activation[0][0]
D)

block4j_bn (BatchNormalization (None, 14, 14, 960) 3840
['block4j_dwconv[0][0]']
)

block4j_activation (Activation (None, 14, 14, 960) 0
['block4j_bn[0][0]']
)

block4j_se_squeeze (GlobalAver (None, 960) 0
['block4j_activation[0][0]']
agePooling2D)

block4j_se_reshape (Reshape) (None, 1, 1, 960) 0
['block4j_se_squeeze[0][0]']

block4j_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block4j_se_reshape[0][0]']

```

```

    block4j_se_expand (Conv2D)      (None, 1, 1, 960)    39360
['block4j_se_reduce[0][0]']

    block4j_se_excite (Multiply)    (None, 14, 14, 960)  0
['block4j_activation[0][0]',
'block4j_se_expand[0][0]']

    block4j_project_conv (Conv2D)   (None, 14, 14, 160)  153600
['block4j_se_excite[0][0]']

    block4j_project_bn (BatchNorma  (None, 14, 14, 160)  640
['block4j_project_conv[0][0]'
lization)

    block4j_drop (Dropout)          (None, 14, 14, 160)  0
['block4j_project_bn[0][0]']

    block4j_add (Add)               (None, 14, 14, 160)  0
['block4j_drop[0][0]',
'block4i_add[0][0]']

    block5a_expand_conv (Conv2D)    (None, 14, 14, 960)  153600
['block4j_add[0][0]']

    block5a_expand_bn (BatchNormal  (None, 14, 14, 960)  3840
['block5a_expand_conv[0][0]'
ization)

    block5a_expand_activation (Act  (None, 14, 14, 960)  0
['block5a_expand_bn[0][0]'
ivation)

    block5a_dwconv (DepthwiseConv2  (None, 14, 14, 960)  24000
['block5a_expand_activation[0][0]
D)

    block5a_bn (BatchNormalization  (None, 14, 14, 960)  3840
['block5a_dwconv[0][0]'
)

    block5a_activation (Activation  (None, 14, 14, 960)  0
['block5a_bn[0][0]'
)

    block5a_se_squeeze (GlobalAver  (None, 960)          0
['block5a_activation[0][0]'
agePooling2D)

```

```

    block5a_se_reshape (Reshape)      (None, 1, 1, 960)      0
['block5a_se_squeeze[0][0]']

    block5a_se_reduce (Conv2D)        (None, 1, 1, 40)      38440
['block5a_se_reshape[0][0]']

    block5a_se_expand (Conv2D)        (None, 1, 1, 960)      39360
['block5a_se_reduce[0][0]']

    block5a_se_excite (Multiply)      (None, 14, 14, 960)   0
['block5a_activation[0][0]',
'block5a_se_expand[0][0]']

    block5a_project_conv (Conv2D)     (None, 14, 14, 224)   215040
['block5a_se_excite[0][0]']

    block5a_project_bn (BatchNormal   (None, 14, 14, 224)   896
['block5a_project_conv[0][0]',
lization)

    block5b_expand_conv (Conv2D)      (None, 14, 14, 1344   301056
['block5a_project_bn[0][0]']

    )

    block5b_expand_bn (BatchNormal    (None, 14, 14, 1344   5376
['block5b_expand_conv[0][0]']
lization)

    )

    block5b_expand_activation (Act     (None, 14, 14, 1344   0
['block5b_expand_bn[0][0]']
ivation)

    )

    block5b_dwconv (DepthwiseConv2    (None, 14, 14, 1344   33600
['block5b_expand_activation[0][0]
D)

    )

    block5b_bn (BatchNormalization    (None, 14, 14, 1344   5376
['block5b_dwconv[0][0]']

    )

    )

    block5b_activation (Activation     (None, 14, 14, 1344   0
['block5b_bn[0][0]']

    )

    )

    block5b_se_squeeze (GlobalAver     (None, 1344)          0
['block5b_activation[0][0]']
agePooling2D)

```

```

    block5b_se_reshape (Reshape)      (None, 1, 1, 1344)    0
['block5b_se_squeeze[0][0]']

    block5b_se_reduce (Conv2D)        (None, 1, 1, 56)      75320
['block5b_se_reshape[0][0]']

    block5b_se_expand (Conv2D)        (None, 1, 1, 1344)    76608
['block5b_se_reduce[0][0]']

    block5b_se_excite (Multiply)      (None, 14, 14, 1344)  0
['block5b_activation[0][0]',
    )
    'block5b_se_expand[0][0]']

    block5b_project_conv (Conv2D)     (None, 14, 14, 224)  301056
['block5b_se_excite[0][0]']

    block5b_project_bn (BatchNormali (None, 14, 14, 224)  896
['block5b_project_conv[0][0]']
    zation)

    block5b_drop (Dropout)            (None, 14, 14, 224)  0
['block5b_project_bn[0][0]']

    block5b_add (Add)                 (None, 14, 14, 224)  0
['block5b_drop[0][0]',
    'block5a_project_bn[0][0]']

    block5c_expand_conv (Conv2D)      (None, 14, 14, 1344)  301056
['block5b_add[0][0]']
    )

    block5c_expand_bn (BatchNormali (None, 14, 14, 1344)  5376
['block5c_expand_conv[0][0]']
    zation)
    )

    block5c_expand_activation (Acti (None, 14, 14, 1344)  0
['block5c_expand_bn[0][0]']
    vation)
    )

    block5c_dwconv (DepthwiseConv2 (None, 14, 14, 1344)  33600
['block5c_expand_activation[0][0]
    D)
    )
    ']'

    block5c_bn (BatchNormalization) (None, 14, 14, 1344)  5376
['block5c_dwconv[0][0]']
    )
    )

```

```

    block5c_activation (Activation (None, 14, 14, 1344  0
['block5c_bn[0][0]']
    )

    block5c_se_squeeze (GlobalAveragePooling2D) (None, 1344) 0
['block5c_activation[0][0]']

    block5c_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5c_se_squeeze[0][0]']

    block5c_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5c_se_reshape[0][0]']

    block5c_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block5c_se_reduce[0][0]']

    block5c_se_excite (Multiply) (None, 14, 14, 1344 0
['block5c_activation[0][0]',
    'block5c_se_expand[0][0]']

    block5c_project_conv (Conv2D) (None, 14, 14, 224) 301056
['block5c_se_excite[0][0]']

    block5c_project_bn (BatchNormalization) (None, 14, 14, 224) 896
['block5c_project_conv[0][0]']

    block5c_drop (Dropout) (None, 14, 14, 224) 0
['block5c_project_bn[0][0]']

    block5c_add (Add) (None, 14, 14, 224) 0
['block5c_drop[0][0]',
    'block5b_add[0][0]']

    block5d_expand_conv (Conv2D) (None, 14, 14, 1344 301056
['block5c_add[0][0]']

    block5d_expand_bn (BatchNormalization) (None, 14, 14, 1344 5376
['block5d_expand_conv[0][0]']

    block5d_expand_activation (Activation) (None, 14, 14, 1344 0
['block5d_expand_bn[0][0]']

```

```

    block5d_dwconv (DepthwiseConv2D (None, 14, 14, 1344) 33600
['block5d_expand_activation[0][0]
D)
')

    block5d_bn (BatchNormalization (None, 14, 14, 1344) 5376
['block5d_dwconv[0][0]']
)

    block5d_activation (Activation (None, 14, 14, 1344) 0
['block5d_bn[0][0]']
)

    block5d_se_squeeze (GlobalAveragePooling2D (None, 1344) 0
['block5d_activation[0][0]']
agePooling2D)

    block5d_se_reshape (Reshape (None, 1, 1, 1344) 0
['block5d_se_squeeze[0][0]']

    block5d_se_reduce (Conv2D (None, 1, 1, 56) 75320
['block5d_se_reshape[0][0]']

    block5d_se_expand (Conv2D (None, 1, 1, 1344) 76608
['block5d_se_reduce[0][0]']

    block5d_se_excite (Multiply (None, 14, 14, 1344) 0
['block5d_activation[0][0]',
)
'block5d_se_expand[0][0]']

    block5d_project_conv (Conv2D (None, 14, 14, 224) 301056
['block5d_se_excite[0][0]']

    block5d_project_bn (BatchNormalization (None, 14, 14, 224) 896
['block5d_project_conv[0][0]']
lization)

    block5d_drop (Dropout (None, 14, 14, 224) 0
['block5d_project_bn[0][0]']

    block5d_add (Add (None, 14, 14, 224) 0
['block5d_drop[0][0]',
'block5c_add[0][0]']

    block5e_expand_conv (Conv2D (None, 14, 14, 1344) 301056
['block5d_add[0][0]']
)

```

```

block5e_expand_bn (BatchNormal (None, 14, 14, 1344 5376
['block5e_expand_conv[0][0]']
ization)
)

block5e_expand_activation (Act (None, 14, 14, 1344 0
['block5e_expand_bn[0][0]']
ivation)
)

block5e_dwconv (DepthwiseConv2 (None, 14, 14, 1344 33600
['block5e_expand_activation[0][0]
D)
)
']

block5e_bn (BatchNormalization (None, 14, 14, 1344 5376
['block5e_dwconv[0][0]']
)
)

block5e_activation (Activation (None, 14, 14, 1344 0
['block5e_bn[0][0]']
)
)

block5e_se_squeeze (GlobalAver (None, 1344) 0
['block5e_activation[0][0]']
agePooling2D)

block5e_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5e_se_squeeze[0][0]']

block5e_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5e_se_reshape[0][0]']

block5e_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block5e_se_reduce[0][0]']

block5e_se_excite (Multiply) (None, 14, 14, 1344 0
['block5e_activation[0][0]',
)
['block5e_se_expand[0][0]']

block5e_project_conv (Conv2D) (None, 14, 14, 224) 301056
['block5e_se_excite[0][0]']

block5e_project_bn (BatchNorma (None, 14, 14, 224) 896
['block5e_project_conv[0][0]']
lization)

block5e_drop (Dropout) (None, 14, 14, 224) 0
['block5e_project_bn[0][0]']

```



```

    block5e_add (Add) (None, 14, 14, 224) 0
['block5e_drop[0][0]',
'block5d_add[0][0]']

    block5f_expand_conv (Conv2D) (None, 14, 14, 1344 301056
['block5e_add[0][0]']
    )

    block5f_expand_bn (BatchNormal (None, 14, 14, 1344 5376
['block5f_expand_conv[0][0]']
    ization)
    )

    block5f_expand_activation (Act (None, 14, 14, 1344 0
['block5f_expand_bn[0][0]']
    ivation)
    )

    block5f_dwconv (DepthwiseConv2 (None, 14, 14, 1344 33600
['block5f_expand_activation[0][0]
    D)
    )
    ']'

    block5f_bn (BatchNormalization (None, 14, 14, 1344 5376
['block5f_dwconv[0][0]']
    )
    )

    block5f_activation (Activation (None, 14, 14, 1344 0
['block5f_bn[0][0]']
    )
    )

    block5f_se_squeeze (GlobalAver (None, 1344) 0
['block5f_activation[0][0]']
    agePooling2D)

    block5f_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5f_se_squeeze[0][0]']

    block5f_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5f_se_reshape[0][0]']

    block5f_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block5f_se_reduce[0][0]']

    block5f_se_excite (Multiply) (None, 14, 14, 1344 0
['block5f_activation[0][0]',
    )
    'block5f_se_expand[0][0]']

    block5f_project_conv (Conv2D) (None, 14, 14, 224) 301056

```

```

['block5f_se_excite[0][0]']

block5f_project_bn (BatchNormal (None, 14, 14, 224) 896
['block5f_project_conv[0][0]']
lization)

block5f_drop (Dropout) (None, 14, 14, 224) 0
['block5f_project_bn[0][0]']

block5f_add (Add) (None, 14, 14, 224) 0
['block5f_drop[0][0]',
'block5e_add[0][0]']

block5g_expand_conv (Conv2D) (None, 14, 14, 1344 301056
['block5f_add[0][0]']
)

block5g_expand_bn (BatchNormal (None, 14, 14, 1344 5376
['block5g_expand_conv[0][0]']
lization)
)

block5g_expand_activation (Act (None, 14, 14, 1344 0
['block5g_expand_bn[0][0]']
ivation)
)

block5g_dwconv (DepthwiseConv2 (None, 14, 14, 1344 33600
['block5g_expand_activation[0][0]
D)
)

block5g_bn (BatchNormalization (None, 14, 14, 1344 5376
['block5g_dwconv[0][0]']
)
)

block5g_activation (Activation (None, 14, 14, 1344 0
['block5g_bn[0][0]']
)
)

block5g_se_squeeze (GlobalAver (None, 1344) 0
['block5g_activation[0][0]']
agePooling2D)

block5g_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5g_se_squeeze[0][0]']

block5g_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5g_se_reshape[0][0]']

block5g_se_expand (Conv2D) (None, 1, 1, 1344) 76608

```

```

['block5g_se_reduce[0][0]']

    block5g_se_excite (Multiply)      (None, 14, 14, 1344) 0
['block5g_activation[0][0]',
    )
'block5g_se_expand[0][0]']

    block5g_project_conv (Conv2D)     (None, 14, 14, 224) 301056
['block5g_se_excite[0][0]']

    block5g_project_bn (BatchNormali (None, 14, 14, 224) 896
['block5g_project_conv[0][0]']
    zation)

    block5g_drop (Dropout)            (None, 14, 14, 224) 0
['block5g_project_bn[0][0]']

    block5g_add (Add)                 (None, 14, 14, 224) 0
['block5g_drop[0][0]',
'block5f_add[0][0]']

    block5h_expand_conv (Conv2D)      (None, 14, 14, 1344) 301056
['block5g_add[0][0]']
    )

    block5h_expand_bn (BatchNormali (None, 14, 14, 1344) 5376
['block5h_expand_conv[0][0]']
    zation)
    )

    block5h_expand_activation (Act (None, 14, 14, 1344) 0
['block5h_expand_bn[0][0]']
    ivation)
    )

    block5h_dwconv (DepthwiseConv2 (None, 14, 14, 1344) 33600
['block5h_expand_activation[0][0]
D)
    )

    block5h_bn (BatchNormalization (None, 14, 14, 1344) 5376
['block5h_dwconv[0][0]']
    )
    )

    block5h_activation (Activation (None, 14, 14, 1344) 0
['block5h_bn[0][0]']
    )
    )

    block5h_se_squeeze (GlobalAver (None, 1344) 0
['block5h_activation[0][0]']
    agePooling2D)

```

```

    block5h_se_reshape (Reshape)      (None, 1, 1, 1344)    0
['block5h_se_squeeze[0][0]']

    block5h_se_reduce (Conv2D)        (None, 1, 1, 56)      75320
['block5h_se_reshape[0][0]']

    block5h_se_expand (Conv2D)        (None, 1, 1, 1344)    76608
['block5h_se_reduce[0][0]']

    block5h_se_excite (Multiply)      (None, 14, 14, 1344)  0
['block5h_activation[0][0]',
    )
'block5h_se_expand[0][0]']

    block5h_project_conv (Conv2D)     (None, 14, 14, 224)  301056
['block5h_se_excite[0][0]']

    block5h_project_bn (BatchNormali (None, 14, 14, 224)  896
['block5h_project_conv[0][0]']
zation)

    block5h_drop (Dropout)            (None, 14, 14, 224)  0
['block5h_project_bn[0][0]']

    block5h_add (Add)                 (None, 14, 14, 224)  0
['block5h_drop[0][0]',
'block5g_add[0][0]']

    block5i_expand_conv (Conv2D)      (None, 14, 14, 1344)  301056
['block5h_add[0][0]']
    )

    block5i_expand_bn (BatchNormali (None, 14, 14, 1344)  5376
['block5i_expand_conv[0][0]']
zation)
    )

    block5i_expand_activation (Acti (None, 14, 14, 1344)  0
['block5i_expand_bn[0][0]']
vation)
    )

    block5i_dwconv (DepthwiseConv2 (None, 14, 14, 1344)  33600
['block5i_expand_activation[0][0]
D)
    )
    ']'

    block5i_bn (BatchNormalization) (None, 14, 14, 1344)  5376
['block5i_dwconv[0][0]']
    )
    )

```

```

    block5i_activation (Activation (None, 14, 14, 1344  0
['block5i_bn[0][0]']
    )

    block5i_se_squeeze (GlobalAveragePooling2D) (None, 1344) 0
['block5i_activation[0][0]']

    block5i_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5i_se_squeeze[0][0]']

    block5i_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5i_se_reshape[0][0]']

    block5i_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block5i_se_reduce[0][0]']

    block5i_se_excite (Multiply) (None, 14, 14, 1344 0
['block5i_activation[0][0]',
    'block5i_se_expand[0][0]']

    block5i_project_conv (Conv2D) (None, 14, 14, 224) 301056
['block5i_se_excite[0][0]']

    block5i_project_bn (BatchNormalization) (None, 14, 14, 224) 896
['block5i_project_conv[0][0]']

    block5i_drop (Dropout) (None, 14, 14, 224) 0
['block5i_project_bn[0][0]']

    block5i_add (Add) (None, 14, 14, 224) 0
['block5i_drop[0][0]',
    'block5h_add[0][0]']

    block5j_expand_conv (Conv2D) (None, 14, 14, 1344 301056
['block5i_add[0][0]']

    block5j_expand_bn (BatchNormalization) (None, 14, 14, 1344 5376
['block5j_expand_conv[0][0]']

    block5j_expand_activation (Activation) (None, 14, 14, 1344 0
['block5j_expand_bn[0][0]']

```

```

block5j_dwconv (DepthwiseConv2D (None, 14, 14, 1344) 33600
['block5j_expand_activation[0][0]
D)
')

block5j_bn (BatchNormalization (None, 14, 14, 1344) 5376
['block5j_dwconv[0][0]']
)

block5j_activation (Activation (None, 14, 14, 1344) 0
['block5j_bn[0][0]']
)

block5j_se_squeeze (GlobalAveragePooling2D) (None, 1344) 0
['block5j_activation[0][0]']
agePooling2D)

block5j_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block5j_se_squeeze[0][0]']

block5j_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block5j_se_reshape[0][0]']

block5j_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block5j_se_reduce[0][0]']

block5j_se_excite (Multiply) (None, 14, 14, 1344) 0
['block5j_activation[0][0]',
)
['block5j_se_expand[0][0]']

block5j_project_conv (Conv2D) (None, 14, 14, 224) 301056
['block5j_se_excite[0][0]']

block5j_project_bn (BatchNormalization) (None, 14, 14, 224) 896
['block5j_project_conv[0][0]']
lization)

block5j_drop (Dropout) (None, 14, 14, 224) 0
['block5j_project_bn[0][0]']

block5j_add (Add) (None, 14, 14, 224) 0
['block5j_drop[0][0]',
'block5i_add[0][0]']

block6a_expand_conv (Conv2D) (None, 14, 14, 1344) 301056
['block5j_add[0][0]']
)

```

```

block6a_expand_bn (BatchNormal (None, 14, 14, 1344) 5376
['block6a_expand_conv[0][0]']
ization)

block6a_expand_activation (Act (None, 14, 14, 1344) 0
['block6a_expand_bn[0][0]']
ivation)

block6a_dwconv_pad (ZeroPaddin (None, 17, 17, 1344) 0
['block6a_expand_activation[0][0]
g2D)

block6a_dwconv (DepthwiseConv2 (None, 7, 7, 1344) 33600
['block6a_dwconv_pad[0][0]']
D)

block6a_bn (BatchNormalization (None, 7, 7, 1344) 5376
['block6a_dwconv[0][0]']
)

block6a_activation (Activation (None, 7, 7, 1344) 0
['block6a_bn[0][0]']
)

block6a_se_squeeze (GlobalAver (None, 1344) 0
['block6a_activation[0][0]']
agePooling2D)

block6a_se_reshape (Reshape) (None, 1, 1, 1344) 0
['block6a_se_squeeze[0][0]']

block6a_se_reduce (Conv2D) (None, 1, 1, 56) 75320
['block6a_se_reshape[0][0]']

block6a_se_expand (Conv2D) (None, 1, 1, 1344) 76608
['block6a_se_reduce[0][0]']

block6a_se_excite (Multiply) (None, 7, 7, 1344) 0
['block6a_activation[0][0]',
'block6a_se_expand[0][0]']

block6a_project_conv (Conv2D) (None, 7, 7, 384) 516096
['block6a_se_excite[0][0]']

block6a_project_bn (BatchNorma (None, 7, 7, 384) 1536
['block6a_project_conv[0][0]']
lization)

```

```

    block6b_expand_conv (Conv2D)      (None, 7, 7, 2304)    884736
['block6a_project_bn[0][0]']

    block6b_expand_bn (BatchNormal    (None, 7, 7, 2304)    9216
['block6b_expand_conv[0][0]']
ization)

    block6b_expand_activation (Act     (None, 7, 7, 2304)    0
['block6b_expand_bn[0][0]']
ivation)

    block6b_dwconv (DepthwiseConv2    (None, 7, 7, 2304)    57600
['block6b_expand_activation[0][0]
D)

    block6b_bn (BatchNormalization    (None, 7, 7, 2304)    9216
['block6b_dwconv[0][0]']
)

    block6b_activation (Activation    (None, 7, 7, 2304)    0
['block6b_bn[0][0]']
)

    block6b_se_squeeze (GlobalAver     (None, 2304)          0
['block6b_activation[0][0]']
agePooling2D)

    block6b_se_reshape (Reshape)      (None, 1, 1, 2304)    0
['block6b_se_squeeze[0][0]']

    block6b_se_reduce (Conv2D)        (None, 1, 1, 96)      221280
['block6b_se_reshape[0][0]']

    block6b_se_expand (Conv2D)        (None, 1, 1, 2304)    223488
['block6b_se_reduce[0][0]']

    block6b_se_excite (Multiply)      (None, 7, 7, 2304)    0
['block6b_activation[0][0]',
'block6b_se_expand[0][0]']

    block6b_project_conv (Conv2D)     (None, 7, 7, 384)     884736
['block6b_se_excite[0][0]']

    block6b_project_bn (BatchNorma    (None, 7, 7, 384)     1536
['block6b_project_conv[0][0]']
lization)

```


block6b_drop (Dropout)	(None, 7, 7, 384)	0
['block6b_project_bn[0][0]']		
block6b_add (Add)	(None, 7, 7, 384)	0
['block6b_drop[0][0]',		
'block6a_project_bn[0][0]']		
block6c_expand_conv (Conv2D)	(None, 7, 7, 2304)	884736
['block6b_add[0][0]']		
block6c_expand_bn (BatchNormal	(None, 7, 7, 2304)	9216
['block6c_expand_conv[0][0]']		
ization)		
block6c_expand_activation (Act	(None, 7, 7, 2304)	0
['block6c_expand_bn[0][0]']		
ivation)		
block6c_dwconv (DepthwiseConv2	(None, 7, 7, 2304)	57600
['block6c_expand_activation[0][0]		
D)		
block6c_bn (BatchNormalization	(None, 7, 7, 2304)	9216
['block6c_dwconv[0][0]']		
)		
block6c_activation (Activation	(None, 7, 7, 2304)	0
['block6c_bn[0][0]']		
)		
block6c_se_squeeze (GlobalAver	(None, 2304)	0
['block6c_activation[0][0]']		
agePooling2D)		
block6c_se_reshape (Reshape)	(None, 1, 1, 2304)	0
['block6c_se_squeeze[0][0]']		
block6c_se_reduce (Conv2D)	(None, 1, 1, 96)	221280
['block6c_se_reshape[0][0]']		
block6c_se_expand (Conv2D)	(None, 1, 1, 2304)	223488
['block6c_se_reduce[0][0]']		
block6c_se_excite (Multiply)	(None, 7, 7, 2304)	0
['block6c_activation[0][0]',		
'block6c_se_expand[0][0]']		
block6c_project_conv (Conv2D)	(None, 7, 7, 384)	884736

```

['block6c_se_excite[0][0]']

block6c_project_bn (BatchNormal (None, 7, 7, 384) 1536
['block6c_project_conv[0][0]']
lization)

block6c_drop (Dropout) (None, 7, 7, 384) 0
['block6c_project_bn[0][0]']

block6c_add (Add) (None, 7, 7, 384) 0
['block6c_drop[0][0]',
'block6b_add[0][0]']

block6d_expand_conv (Conv2D) (None, 7, 7, 2304) 884736
['block6c_add[0][0]']

block6d_expand_bn (BatchNormal (None, 7, 7, 2304) 9216
['block6d_expand_conv[0][0]']
ization)

block6d_expand_activation (Act (None, 7, 7, 2304) 0
['block6d_expand_bn[0][0]']
ivation)

block6d_dwconv (DepthwiseConv2 (None, 7, 7, 2304) 57600
['block6d_expand_activation[0][0]
D)

block6d_bn (BatchNormalization (None, 7, 7, 2304) 9216
['block6d_dwconv[0][0]']
)

block6d_activation (Activation (None, 7, 7, 2304) 0
['block6d_bn[0][0]']
)

block6d_se_squeeze (GlobalAver (None, 2304) 0
['block6d_activation[0][0]']
agePooling2D)

block6d_se_reshape (Reshape) (None, 1, 1, 2304) 0
['block6d_se_squeeze[0][0]']

block6d_se_reduce (Conv2D) (None, 1, 1, 96) 221280
['block6d_se_reshape[0][0]']

block6d_se_expand (Conv2D) (None, 1, 1, 2304) 223488
['block6d_se_reduce[0][0]']

```

```

    block6d_se_excite (Multiply)    (None, 7, 7, 2304)    0
['block6d_activation[0][0]',
'block6d_se_expand[0][0]']

    block6d_project_conv (Conv2D)  (None, 7, 7, 384)    884736
['block6d_se_excite[0][0]']

    block6d_project_bn (BatchNorma (None, 7, 7, 384)    1536
['block6d_project_conv[0][0]']
lization)

    block6d_drop (Dropout)          (None, 7, 7, 384)    0
['block6d_project_bn[0][0]']

    block6d_add (Add)               (None, 7, 7, 384)    0
['block6d_drop[0][0]',
'block6c_add[0][0]']

    block6e_expand_conv (Conv2D)    (None, 7, 7, 2304)    884736
['block6d_add[0][0]']

    block6e_expand_bn (BatchNormal (None, 7, 7, 2304)    9216
['block6e_expand_conv[0][0]']
ization)

    block6e_expand_activation (Act (None, 7, 7, 2304)    0
['block6e_expand_bn[0][0]']
ivation)

    block6e_dwconv (DepthwiseConv2 (None, 7, 7, 2304)    57600
['block6e_expand_activation[0][0]
D)

    block6e_bn (BatchNormalization (None, 7, 7, 2304)    9216
['block6e_dwconv[0][0]']
)

    block6e_activation (Activation (None, 7, 7, 2304)    0
['block6e_bn[0][0]']
)

    block6e_se_squeeze (GlobalAver (None, 2304)          0
['block6e_activation[0][0]']
agePooling2D)

    block6e_se_reshape (Reshape)    (None, 1, 1, 2304)    0
['block6e_se_squeeze[0][0]']

```

block6e_se_reduce (Conv2D) ['block6e_se_reshape[0][0]']	(None, 1, 1, 96)	221280
block6e_se_expand (Conv2D) ['block6e_se_reduce[0][0]']	(None, 1, 1, 2304)	223488
block6e_se_excite (Multiply) ['block6e_activation[0][0]', 'block6e_se_expand[0][0]']	(None, 7, 7, 2304)	0
block6e_project_conv (Conv2D) ['block6e_se_excite[0][0]']	(None, 7, 7, 384)	884736
block6e_project_bn (BatchNormal lization) ['block6e_project_conv[0][0]']	(None, 7, 7, 384)	1536
block6e_drop (Dropout) ['block6e_project_bn[0][0]']	(None, 7, 7, 384)	0
block6e_add (Add) ['block6e_drop[0][0]', 'block6d_add[0][0]']	(None, 7, 7, 384)	0
block6f_expand_conv (Conv2D) ['block6e_add[0][0]']	(None, 7, 7, 2304)	884736
block6f_expand_bn (BatchNormal ization) ['block6f_expand_conv[0][0]']	(None, 7, 7, 2304)	9216
block6f_expand_activation (Act ivation) ['block6f_expand_bn[0][0]']	(None, 7, 7, 2304)	0
block6f_dwconv (DepthwiseConv2 D)	(None, 7, 7, 2304)	57600
block6f_bn (BatchNormalization) ['block6f_dwconv[0][0]']	(None, 7, 7, 2304)	9216
block6f_activation (Activation) ['block6f_bn[0][0]']	(None, 7, 7, 2304)	0

block6f_se_squeeze (GlobalAveragePooling2D)	(None, 2304)	0	
['block6f_activation[0][0]']			
block6f_se_reshape (Reshape)	(None, 1, 1, 2304)	0	
['block6f_se_squeeze[0][0]']			
block6f_se_reduce (Conv2D)	(None, 1, 1, 96)	221280	
['block6f_se_reshape[0][0]']			
block6f_se_expand (Conv2D)	(None, 1, 1, 2304)	223488	
['block6f_se_reduce[0][0]']			
block6f_se_excite (Multiply)	(None, 7, 7, 2304)	0	
['block6f_activation[0][0]', 'block6f_se_expand[0][0]']			
block6f_project_conv (Conv2D)	(None, 7, 7, 384)	884736	
['block6f_se_excite[0][0]']			
block6f_project_bn (BatchNormalization)	(None, 7, 7, 384)	1536	
['block6f_project_conv[0][0]']			
block6f_drop (Dropout)	(None, 7, 7, 384)	0	
['block6f_project_bn[0][0]']			
block6f_add (Add)	(None, 7, 7, 384)	0	
['block6f_drop[0][0]', 'block6e_add[0][0]']			
block6g_expand_conv (Conv2D)	(None, 7, 7, 2304)	884736	
['block6f_add[0][0]']			
block6g_expand_bn (BatchNormalization)	(None, 7, 7, 2304)	9216	
['block6g_expand_conv[0][0]']			
block6g_expand_activation (Activation)	(None, 7, 7, 2304)	0	
['block6g_expand_bn[0][0]']			
block6g_dwconv (DepthwiseConv2D)	(None, 7, 7, 2304)	57600	
['block6g_expand_activation[0][0]']			
block6g_bn (BatchNormalization)	(None, 7, 7, 2304)	9216	
['block6g_dwconv[0][0]']			

```

)

block6g_activation (Activation (None, 7, 7, 2304) 0
['block6g_bn[0][0]']
)

block6g_se_squeeze (GlobalAveragePooling2D) (None, 2304) 0
['block6g_activation[0][0]']

block6g_se_reshape (Reshape) (None, 1, 1, 2304) 0
['block6g_se_squeeze[0][0]']

block6g_se_reduce (Conv2D) (None, 1, 1, 96) 221280
['block6g_se_reshape[0][0]']

block6g_se_expand (Conv2D) (None, 1, 1, 2304) 223488
['block6g_se_reduce[0][0]']

block6g_se_excite (Multiply) (None, 7, 7, 2304) 0
['block6g_activation[0][0]',
'block6g_se_expand[0][0]']

block6g_project_conv (Conv2D) (None, 7, 7, 384) 884736
['block6g_se_excite[0][0]']

block6g_project_bn (BatchNormalization) (None, 7, 7, 384) 1536
['block6g_project_conv[0][0]']

block6g_drop (Dropout) (None, 7, 7, 384) 0
['block6g_project_bn[0][0]']

block6g_add (Add) (None, 7, 7, 384) 0
['block6g_drop[0][0]',
'block6f_add[0][0]']

block6h_expand_conv (Conv2D) (None, 7, 7, 2304) 884736
['block6g_add[0][0]']

block6h_expand_bn (BatchNormalization) (None, 7, 7, 2304) 9216
['block6h_expand_conv[0][0]']

block6h_expand_activation (Activation) (None, 7, 7, 2304) 0
['block6h_expand_bn[0][0]']

```

```

    block6h_dwconv (DepthwiseConv2D (None, 7, 7, 2304) 57600
['block6h_expand_activation[0][0]
D)

    block6h_bn (BatchNormalization (None, 7, 7, 2304) 9216
['block6h_dwconv[0][0]')

    block6h_activation (Activation (None, 7, 7, 2304) 0
['block6h_bn[0][0]')

    block6h_se_squeeze (GlobalAveragePooling2D (None, 2304) 0
['block6h_activation[0][0]')

    block6h_se_reshape (Reshape (None, 1, 1, 2304) 0
['block6h_se_squeeze[0][0]')

    block6h_se_reduce (Conv2D (None, 1, 1, 96) 221280
['block6h_se_reshape[0][0]')

    block6h_se_expand (Conv2D (None, 1, 1, 2304) 223488
['block6h_se_reduce[0][0]')

    block6h_se_excite (Multiply (None, 7, 7, 2304) 0
['block6h_activation[0][0]',
'block6h_se_expand[0][0]')

    block6h_project_conv (Conv2D (None, 7, 7, 384) 884736
['block6h_se_excite[0][0]')

    block6h_project_bn (BatchNormalization (None, 7, 7, 384) 1536
['block6h_project_conv[0][0]')

    block6h_drop (Dropout (None, 7, 7, 384) 0
['block6h_project_bn[0][0]')

    block6h_add (Add (None, 7, 7, 384) 0
['block6h_drop[0][0]',
'block6g_add[0][0]')

    block6i_expand_conv (Conv2D (None, 7, 7, 2304) 884736
['block6h_add[0][0]')

    block6i_expand_bn (BatchNormalization (None, 7, 7, 2304) 9216
['block6i_expand_conv[0][0]')

```

```

ization)

block6i_expand_activation (Activation (None, 7, 7, 2304) 0
['block6i_expand_bn[0][0]'])
ivation)

block6i_dwconv (DepthwiseConv2D (None, 7, 7, 2304) 57600
['block6i_expand_activation[0][0]
D)

block6i_bn (BatchNormalization (None, 7, 7, 2304) 9216
['block6i_dwconv[0][0]'])
)

block6i_activation (Activation (None, 7, 7, 2304) 0
['block6i_bn[0][0]'])
)

block6i_se_squeeze (GlobalAveragePooling2D (None, 2304) 0
['block6i_activation[0][0]'])
agePooling2D)

block6i_se_reshape (Reshape (None, 1, 1, 2304) 0
['block6i_se_squeeze[0][0]'])

block6i_se_reduce (Conv2D (None, 1, 1, 96) 221280
['block6i_se_reshape[0][0]'])

block6i_se_expand (Conv2D (None, 1, 1, 2304) 223488
['block6i_se_reduce[0][0]'])

block6i_se_excite (Multiply (None, 7, 7, 2304) 0
['block6i_activation[0][0]',
'block6i_se_expand[0][0]'])

block6i_project_conv (Conv2D (None, 7, 7, 384) 884736
['block6i_se_excite[0][0]'])

block6i_project_bn (BatchNormalization (None, 7, 7, 384) 1536
['block6i_project_conv[0][0]'])
lization)

block6i_drop (Dropout (None, 7, 7, 384) 0
['block6i_project_bn[0][0]'])

block6i_add (Add (None, 7, 7, 384) 0
['block6i_drop[0][0]',
'block6h_add[0][0]'])

```



```

    block6j_expand_conv (Conv2D)      (None, 7, 7, 2304)  884736
['block6i_add[0][0]']

    block6j_expand_bn (BatchNormal    (None, 7, 7, 2304)  9216
['block6j_expand_conv[0][0]']
    ization)

    block6j_expand_activation (Act     (None, 7, 7, 2304)  0
['block6j_expand_bn[0][0]']
    ivation)

    block6j_dwconv (DepthwiseConv2    (None, 7, 7, 2304)  57600
['block6j_expand_activation[0][0]
    D)

    block6j_bn (BatchNormalization    (None, 7, 7, 2304)  9216
['block6j_dwconv[0][0]']
    )

    block6j_activation (Activation     (None, 7, 7, 2304)  0
['block6j_bn[0][0]']
    )

    block6j_se_squeeze (GlobalAver     (None, 2304)      0
['block6j_activation[0][0]']
    agePooling2D)

    block6j_se_reshape (Reshape)       (None, 1, 1, 2304)  0
['block6j_se_squeeze[0][0]']

    block6j_se_reduce (Conv2D)         (None, 1, 1, 96)   221280
['block6j_se_reshape[0][0]']

    block6j_se_expand (Conv2D)         (None, 1, 1, 2304)  223488
['block6j_se_reduce[0][0]']

    block6j_se_excite (Multiply)       (None, 7, 7, 2304)  0
['block6j_activation[0][0]',
'block6j_se_expand[0][0]']

    block6j_project_conv (Conv2D)      (None, 7, 7, 384)  884736
['block6j_se_excite[0][0]']

    block6j_project_bn (BatchNorma     (None, 7, 7, 384)  1536
['block6j_project_conv[0][0]']
    lization)

```

block6j_drop (Dropout)	(None, 7, 7, 384)	0
['block6j_project_bn[0][0]']		
block6j_add (Add)	(None, 7, 7, 384)	0
['block6j_drop[0][0]',		
'block6i_add[0][0]']		
block6k_expand_conv (Conv2D)	(None, 7, 7, 2304)	884736
['block6j_add[0][0]']		
block6k_expand_bn (BatchNormal	(None, 7, 7, 2304)	9216
['block6k_expand_conv[0][0]']		
ization)		
block6k_expand_activation (Act	(None, 7, 7, 2304)	0
['block6k_expand_bn[0][0]']		
ivation)		
block6k_dwconv (DepthwiseConv2	(None, 7, 7, 2304)	57600
['block6k_expand_activation[0][0]		
D)		
block6k_bn (BatchNormalization	(None, 7, 7, 2304)	9216
['block6k_dwconv[0][0]']		
)		
block6k_activation (Activation	(None, 7, 7, 2304)	0
['block6k_bn[0][0]']		
)		
block6k_se_squeeze (GlobalAver	(None, 2304)	0
['block6k_activation[0][0]']		
agePooling2D)		
block6k_se_reshape (Reshape)	(None, 1, 1, 2304)	0
['block6k_se_squeeze[0][0]']		
block6k_se_reduce (Conv2D)	(None, 1, 1, 96)	221280
['block6k_se_reshape[0][0]']		
block6k_se_expand (Conv2D)	(None, 1, 1, 2304)	223488
['block6k_se_reduce[0][0]']		
block6k_se_excite (Multiply)	(None, 7, 7, 2304)	0
['block6k_activation[0][0]',		
'block6k_se_expand[0][0]']		
block6k_project_conv (Conv2D)	(None, 7, 7, 384)	884736

```

['block6k_se_excite[0][0]']

block6k_project_bn (BatchNormal (None, 7, 7, 384) 1536
['block6k_project_conv[0][0]']
lization)

block6k_drop (Dropout) (None, 7, 7, 384) 0
['block6k_project_bn[0][0]']

block6k_add (Add) (None, 7, 7, 384) 0
['block6k_drop[0][0]',
'block6j_add[0][0]']

block6l_expand_conv (Conv2D) (None, 7, 7, 2304) 884736
['block6k_add[0][0]']

block6l_expand_bn (BatchNormal (None, 7, 7, 2304) 9216
['block6l_expand_conv[0][0]']
ization)

block6l_expand_activation (Act (None, 7, 7, 2304) 0
['block6l_expand_bn[0][0]']
ivation)

block6l_dwconv (DepthwiseConv2 (None, 7, 7, 2304) 57600
['block6l_expand_activation[0][0]
D)

block6l_bn (BatchNormalization (None, 7, 7, 2304) 9216
['block6l_dwconv[0][0]']
)

block6l_activation (Activation (None, 7, 7, 2304) 0
['block6l_bn[0][0]']
)

block6l_se_squeeze (GlobalAver (None, 2304) 0
['block6l_activation[0][0]']
agePooling2D)

block6l_se_reshape (Reshape) (None, 1, 1, 2304) 0
['block6l_se_squeeze[0][0]']

block6l_se_reduce (Conv2D) (None, 1, 1, 96) 221280
['block6l_se_reshape[0][0]']

block6l_se_expand (Conv2D) (None, 1, 1, 2304) 223488
['block6l_se_reduce[0][0]']

```

```

    block6l_se_excite (Multiply)    (None, 7, 7, 2304)    0
['block6l_activation[0][0]',
'block6l_se_expand[0][0]']

    block6l_project_conv (Conv2D)   (None, 7, 7, 384)    884736
['block6l_se_excite[0][0]']

    block6l_project_bn (BatchNormal (None, 7, 7, 384)    1536
['block6l_project_conv[0][0]']
lization)

    block6l_drop (Dropout)          (None, 7, 7, 384)    0
['block6l_project_bn[0][0]']

    block6l_add (Add)               (None, 7, 7, 384)    0
['block6l_drop[0][0]',
'block6k_add[0][0]']

    block6m_expand_conv (Conv2D)    (None, 7, 7, 2304)    884736
['block6l_add[0][0]']

    block6m_expand_bn (BatchNormal (None, 7, 7, 2304)    9216
['block6m_expand_conv[0][0]']
lization)

    block6m_expand_activation (Act (None, 7, 7, 2304)    0
['block6m_expand_bn[0][0]']
ivation)

    block6m_dwconv (DepthwiseConv2 (None, 7, 7, 2304)    57600
['block6m_expand_activation[0][0]
D)

    block6m_bn (BatchNormalization (None, 7, 7, 2304)    9216
['block6m_dwconv[0][0]']
)

    block6m_activation (Activation (None, 7, 7, 2304)    0
['block6m_bn[0][0]']
)

    block6m_se_squeeze (GlobalAver (None, 2304)        0
['block6m_activation[0][0]']
agePooling2D)

    block6m_se_reshape (Reshape)    (None, 1, 1, 2304)    0
['block6m_se_squeeze[0][0]']

```

block6m_se_reduce (Conv2D) ['block6m_se_reshape[0][0]']	(None, 1, 1, 96)	221280
block6m_se_expand (Conv2D) ['block6m_se_reduce[0][0]']	(None, 1, 1, 2304)	223488
block6m_se_excite (Multiply) ['block6m_activation[0][0]', 'block6m_se_expand[0][0]']	(None, 7, 7, 2304)	0
block6m_project_conv (Conv2D) ['block6m_se_excite[0][0]']	(None, 7, 7, 384)	884736
block6m_project_bn (BatchNormal lization) ['block6m_project_conv[0][0]']	(None, 7, 7, 384)	1536
block6m_drop (Dropout) ['block6m_project_bn[0][0]']	(None, 7, 7, 384)	0
block6m_add (Add) ['block6m_drop[0][0]', 'block6l_add[0][0]']	(None, 7, 7, 384)	0
block7a_expand_conv (Conv2D) ['block6m_add[0][0]']	(None, 7, 7, 2304)	884736
block7a_expand_bn (BatchNormal ization) ['block7a_expand_conv[0][0]']	(None, 7, 7, 2304)	9216
block7a_expand_activation (Act ivation) ['block7a_expand_bn[0][0]']	(None, 7, 7, 2304)	0
block7a_dwconv (DepthwiseConv2 D)	(None, 7, 7, 2304)	20736
block7a_bn (BatchNormalization) ['block7a_dwconv[0][0]']	(None, 7, 7, 2304)	9216
block7a_activation (Activation) ['block7a_bn[0][0]']	(None, 7, 7, 2304)	0

block7a_se_squeeze (GlobalAveragePooling2D)	(None, 2304)	0
['block7a_activation[0][0]']		
block7a_se_reshape (Reshape)	(None, 1, 1, 2304)	0
['block7a_se_squeeze[0][0]']		
block7a_se_reduce (Conv2D)	(None, 1, 1, 96)	221280
['block7a_se_reshape[0][0]']		
block7a_se_expand (Conv2D)	(None, 1, 1, 2304)	223488
['block7a_se_reduce[0][0]']		
block7a_se_excite (Multiply)	(None, 7, 7, 2304)	0
['block7a_activation[0][0]', 'block7a_se_expand[0][0]']		
block7a_project_conv (Conv2D)	(None, 7, 7, 640)	1474560
['block7a_se_excite[0][0]']		
block7a_project_bn (BatchNormalization)	(None, 7, 7, 640)	2560
['block7a_project_conv[0][0]']		
block7b_expand_conv (Conv2D)	(None, 7, 7, 3840)	2457600
['block7a_project_bn[0][0]']		
block7b_expand_bn (BatchNormalization)	(None, 7, 7, 3840)	15360
['block7b_expand_conv[0][0]']		
block7b_expand_activation (Activation)	(None, 7, 7, 3840)	0
['block7b_expand_bn[0][0]']		
block7b_dwconv (DepthwiseConv2D)	(None, 7, 7, 3840)	34560
['block7b_expand_activation[0][0]']		
block7b_bn (BatchNormalization)	(None, 7, 7, 3840)	15360
['block7b_dwconv[0][0]']		
block7b_activation (Activation)	(None, 7, 7, 3840)	0
['block7b_bn[0][0]']		
block7b_se_squeeze (GlobalAveragePooling2D)	(None, 3840)	0

```

['block7b_activation[0][0]']
    agePooling2D)

    block7b_se_reshape (Reshape)      (None, 1, 1, 3840)    0
['block7b_se_squeeze[0][0]']

    block7b_se_reduce (Conv2D)        (None, 1, 1, 160)     614560
['block7b_se_reshape[0][0]']

    block7b_se_expand (Conv2D)        (None, 1, 1, 3840)     618240
['block7b_se_reduce[0][0]']

    block7b_se_excite (Multiply)      (None, 7, 7, 3840)    0
['block7b_activation[0][0]',
'block7b_se_expand[0][0]']

    block7b_project_conv (Conv2D)     (None, 7, 7, 640)     2457600
['block7b_se_excite[0][0]']

    block7b_project_bn (BatchNormali (None, 7, 7, 640)     2560
['block7b_project_conv[0][0]']
    zation)

    block7b_drop (Dropout)            (None, 7, 7, 640)     0
['block7b_project_bn[0][0]']

    block7b_add (Add)                 (None, 7, 7, 640)     0
['block7b_drop[0][0]',
'block7a_project_bn[0][0]']

    block7c_expand_conv (Conv2D)      (None, 7, 7, 3840)     2457600
['block7b_add[0][0]']

    block7c_expand_bn (BatchNormali (None, 7, 7, 3840)     15360
['block7c_expand_conv[0][0]']
    zation)

    block7c_expand_activation (Acti (None, 7, 7, 3840)     0
['block7c_expand_bn[0][0]']
    vation)

    block7c_dwconv (DepthwiseConv2 (None, 7, 7, 3840)     34560
['block7c_expand_activation[0][0]
D)

    block7c_bn (BatchNormalization) (None, 7, 7, 3840)     15360
['block7c_dwconv[0][0]']
)

```

```

    block7c_activation (Activation (None, 7, 7, 3840) 0
['block7c_bn[0][0]']
)

    block7c_se_squeeze (GlobalAveragePooling2D) (None, 3840) 0
['block7c_activation[0][0]']

    block7c_se_reshape (Reshape) (None, 1, 1, 3840) 0
['block7c_se_squeeze[0][0]']

    block7c_se_reduce (Conv2D) (None, 1, 1, 160) 614560
['block7c_se_reshape[0][0]']

    block7c_se_expand (Conv2D) (None, 1, 1, 3840) 618240
['block7c_se_reduce[0][0]']

    block7c_se_excite (Multiply) (None, 7, 7, 3840) 0
['block7c_activation[0][0]',
'block7c_se_expand[0][0]']

    block7c_project_conv (Conv2D) (None, 7, 7, 640) 2457600
['block7c_se_excite[0][0]']

    block7c_project_bn (BatchNormalization) (None, 7, 7, 640) 2560
['block7c_project_conv[0][0]']

    block7c_drop (Dropout) (None, 7, 7, 640) 0
['block7c_project_bn[0][0]']

    block7c_add (Add) (None, 7, 7, 640) 0
['block7c_drop[0][0]',
'block7b_add[0][0]']

    block7d_expand_conv (Conv2D) (None, 7, 7, 3840) 2457600
['block7c_add[0][0]']

    block7d_expand_bn (BatchNormalization) (None, 7, 7, 3840) 15360
['block7d_expand_conv[0][0]']

    block7d_expand_activation (Activation) (None, 7, 7, 3840) 0
['block7d_expand_bn[0][0]']

    block7d_dwconv (DepthwiseConv2D) (None, 7, 7, 3840) 34560

```



```

['block7d_expand_activation[0][0]
D)
']

block7d_bn (BatchNormalization (None, 7, 7, 3840) 15360
['block7d_dwconv[0][0]']
)

block7d_activation (Activation (None, 7, 7, 3840) 0
['block7d_bn[0][0]']
)

block7d_se_squeeze (GlobalAveragePooling2D) (None, 3840) 0
['block7d_activation[0][0]']

block7d_se_reshape (Reshape) (None, 1, 1, 3840) 0
['block7d_se_squeeze[0][0]']

block7d_se_reduce (Conv2D) (None, 1, 1, 160) 614560
['block7d_se_reshape[0][0]']

block7d_se_expand (Conv2D) (None, 1, 1, 3840) 618240
['block7d_se_reduce[0][0]']

block7d_se_excite (Multiply) (None, 7, 7, 3840) 0
['block7d_activation[0][0]',
'block7d_se_expand[0][0]']

block7d_project_conv (Conv2D) (None, 7, 7, 640) 2457600
['block7d_se_excite[0][0]']

block7d_project_bn (BatchNormalization) (None, 7, 7, 640) 2560
['block7d_project_conv[0][0]']

block7d_drop (Dropout) (None, 7, 7, 640) 0
['block7d_project_bn[0][0]']

block7d_add (Add) (None, 7, 7, 640) 0
['block7d_drop[0][0]',
'block7c_add[0][0]']

top_conv (Conv2D) (None, 7, 7, 2560) 1638400
['block7d_add[0][0]']

top_bn (BatchNormalization) (None, 7, 7, 2560) 10240
['top_conv[0][0]']

```

```
top_activation (Activation)      (None, 7, 7, 2560)    0
['top_bn[0][0]']
```

```
=====
=====
Total params: 64,097,687
Trainable params: 63,786,960
Non-trainable params: 310,727
-----
-----
```

```
[8]: x = base_model.output
      x = GlobalAveragePooling2D()(x)
      output = Dense(num_classes, activation='softmax')(x)
      model = Model(inputs=base_model.input, outputs=output)

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

      tensorboard_callback = tf.keras.callbacks.TensorBoard(log_dir='logs')

      hist = model.fit(train_data, epochs=20, validation_data=val_data,
                      ↪callbacks=[tensorboard_callback])
```

WARNING:tensorflow:Model failed to serialize as JSON. Ignoring... Unable to serialize [2.0896919 2.1128857 2.1081853] to JSON. Unrecognized type <class 'tensorflow.python.framework.ops.EagerTensor'>.

Epoch 1/20

335/335 [=====] - 96s 234ms/step - loss: 0.6225 - accuracy: 0.7817 - val_loss: 0.4967 - val_accuracy: 0.8790

Epoch 2/20

335/335 [=====] - 76s 226ms/step - loss: 0.2577 - accuracy: 0.9140 - val_loss: 0.3164 - val_accuracy: 0.9026

Epoch 3/20

335/335 [=====] - 76s 226ms/step - loss: 0.1854 - accuracy: 0.9372 - val_loss: 0.2961 - val_accuracy: 0.9134

Epoch 4/20

335/335 [=====] - 78s 231ms/step - loss: 0.1589 - accuracy: 0.9473 - val_loss: 0.2870 - val_accuracy: 0.9198

Epoch 5/20

335/335 [=====] - 77s 230ms/step - loss: 0.1156 - accuracy: 0.9643 - val_loss: 0.3956 - val_accuracy: 0.9112

Epoch 6/20

335/335 [=====] - 76s 226ms/step - loss: 0.1114 - accuracy: 0.9654 - val_loss: 0.1676 - val_accuracy: 0.9485

Epoch 7/20

335/335 [=====] - 76s 226ms/step - loss: 0.0896 -

```

accuracy: 0.9723 - val_loss: 0.2420 - val_accuracy: 0.9406
Epoch 8/20
335/335 [=====] - 76s 226ms/step - loss: 0.0863 -
accuracy: 0.9733 - val_loss: 0.2081 - val_accuracy: 0.9463
Epoch 9/20
335/335 [=====] - 76s 226ms/step - loss: 0.0812 -
accuracy: 0.9744 - val_loss: 0.5060 - val_accuracy: 0.8898
Epoch 10/20
335/335 [=====] - 80s 238ms/step - loss: 0.0867 -
accuracy: 0.9727 - val_loss: 0.2707 - val_accuracy: 0.9270
Epoch 11/20
335/335 [=====] - 79s 237ms/step - loss: 0.0846 -
accuracy: 0.9736 - val_loss: 0.1567 - val_accuracy: 0.9556
Epoch 12/20
335/335 [=====] - 77s 229ms/step - loss: 0.0635 -
accuracy: 0.9785 - val_loss: 0.2454 - val_accuracy: 0.9327
Epoch 13/20
335/335 [=====] - 77s 229ms/step - loss: 0.0603 -
accuracy: 0.9836 - val_loss: 0.1390 - val_accuracy: 0.9606
Epoch 14/20
335/335 [=====] - 77s 230ms/step - loss: 0.0476 -
accuracy: 0.9830 - val_loss: 0.3233 - val_accuracy: 0.9213
Epoch 15/20
335/335 [=====] - 78s 231ms/step - loss: 0.0556 -
accuracy: 0.9832 - val_loss: 0.2013 - val_accuracy: 0.9506
Epoch 16/20
335/335 [=====] - 77s 231ms/step - loss: 0.0779 -
accuracy: 0.9727 - val_loss: 0.2114 - val_accuracy: 0.9406
Epoch 17/20
335/335 [=====] - 78s 231ms/step - loss: 0.0406 -
accuracy: 0.9879 - val_loss: 0.2270 - val_accuracy: 0.9485
Epoch 18/20
335/335 [=====] - 77s 231ms/step - loss: 0.0490 -
accuracy: 0.9841 - val_loss: 0.1834 - val_accuracy: 0.9506
Epoch 19/20
335/335 [=====] - 78s 231ms/step - loss: 0.0455 -
accuracy: 0.9849 - val_loss: 0.1625 - val_accuracy: 0.9563
Epoch 20/20
335/335 [=====] - 77s 230ms/step - loss: 0.0553 -
accuracy: 0.9839 - val_loss: 0.1546 - val_accuracy: 0.9585

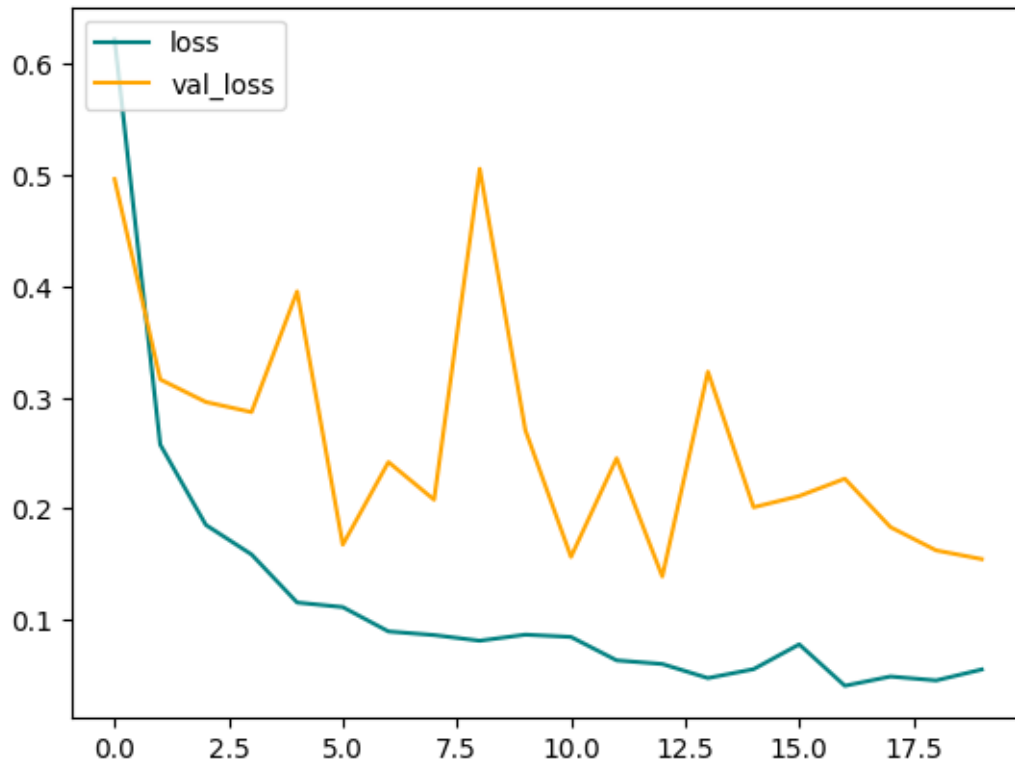
```

```

[9]: fig = plt.figure()
plt.plot(hist.history['loss'], color='teal', label='loss')
plt.plot(hist.history['val_loss'], color='orange', label='val_loss')
fig.suptitle('Loss', fontsize=20)
plt.legend(loc="upper left")
plt.show()

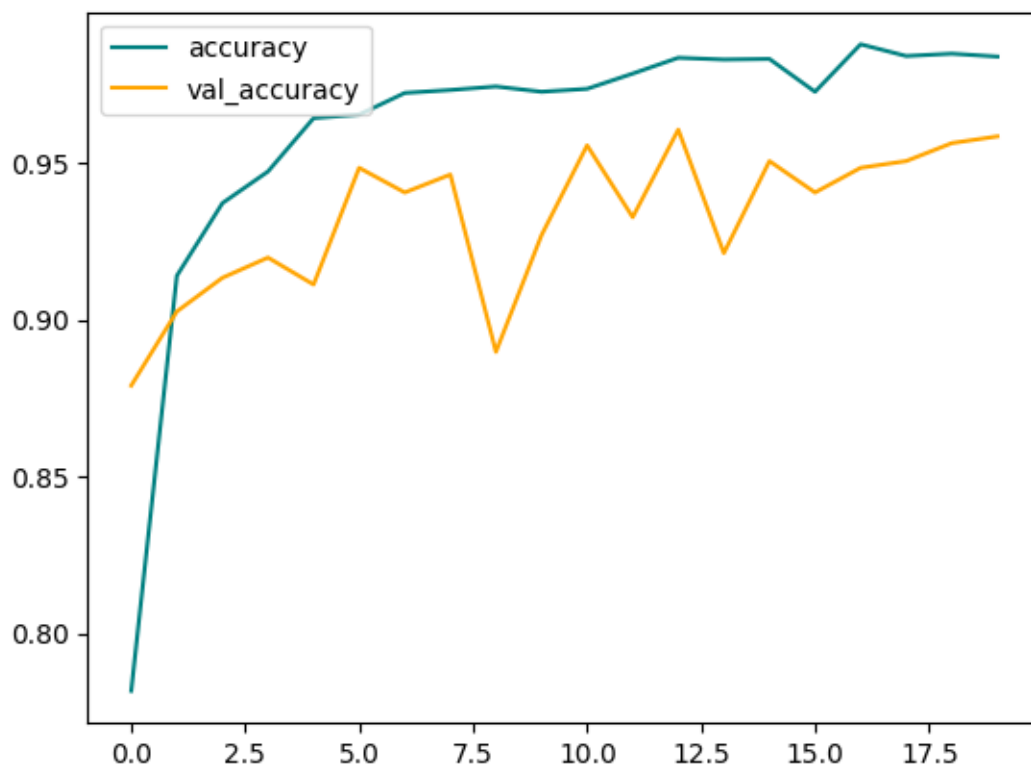
```

Loss



```
[10]: fig = plt.figure()
plt.plot(hist.history['accuracy'], color='teal', label='accuracy')
plt.plot(hist.history['val_accuracy'], color='orange', label='val_accuracy')
fig.suptitle('Accuracy', fontsize=20)
plt.legend(loc="upper left")
plt.show()
```

Accuracy



```
[11]: pre = Precision()
      re = Recall()
      acc = SparseCategoricalAccuracy()
```

```
[12]: for batch in test_data.as_numpy_iterator():
      X, y = batch
      yhat = model.predict(X)

      yhat_classes = tf.argmax(yhat, axis=1)

      pre.update_state(y, yhat_classes)
      re.update_state(y, yhat_classes)
      acc.update_state(y, yhat)
```

```
1/1 [=====] - 2s 2s/step
1/1 [=====] - 0s 64ms/step
1/1 [=====] - 0s 59ms/step
1/1 [=====] - 0s 32ms/step
1/1 [=====] - 0s 37ms/step
1/1 [=====] - 0s 40ms/step
```

1/1 [=====] - 0s 43ms/step
1/1 [=====] - 0s 43ms/step
1/1 [=====] - 0s 46ms/step
1/1 [=====] - 0s 37ms/step
1/1 [=====] - 0s 38ms/step
1/1 [=====] - 0s 41ms/step
1/1 [=====] - 0s 40ms/step
1/1 [=====] - 0s 42ms/step
1/1 [=====] - 0s 34ms/step
1/1 [=====] - 0s 41ms/step
1/1 [=====] - 0s 45ms/step
1/1 [=====] - 0s 35ms/step
1/1 [=====] - 0s 40ms/step
1/1 [=====] - 0s 45ms/step
1/1 [=====] - 0s 36ms/step
1/1 [=====] - 0s 44ms/step
1/1 [=====] - 0s 44ms/step
1/1 [=====] - 0s 36ms/step
1/1 [=====] - 0s 41ms/step
1/1 [=====] - 0s 44ms/step
1/1 [=====] - 0s 32ms/step
1/1 [=====] - 0s 40ms/step
1/1 [=====] - 0s 43ms/step
1/1 [=====] - 0s 34ms/step
1/1 [=====] - 0s 42ms/step
1/1 [=====] - 0s 40ms/step
1/1 [=====] - 0s 46ms/step
1/1 [=====] - 0s 36ms/step
1/1 [=====] - 0s 42ms/step
1/1 [=====] - 0s 33ms/step
1/1 [=====] - 0s 38ms/step
1/1 [=====] - 0s 41ms/step
1/1 [=====] - 0s 32ms/step
1/1 [=====] - 0s 40ms/step
1/1 [=====] - 0s 43ms/step
1/1 [=====] - 0s 36ms/step
1/1 [=====] - 0s 31ms/step
1/1 [=====] - 0s 37ms/step
1/1 [=====] - 0s 45ms/step
1/1 [=====] - 0s 38ms/step
1/1 [=====] - 0s 31ms/step
1/1 [=====] - 0s 38ms/step
1/1 [=====] - 0s 45ms/step
1/1 [=====] - 0s 38ms/step
1/1 [=====] - 0s 30ms/step

```
[13]: print(f"Precision: {pre.result().numpy() * 100 : .2f}%")
      print(f"Recall: {re.result().numpy() * 100 : .2f}%")
      print(f"Accuracy: {acc.result().numpy() * 100 : .2f}%")
```

Precision: 99.52%

Recall: 99.36%

Accuracy: 95.26%

```
[14]: img = cv2.imread('Styles/test/Hatchback/8_jpg.rf.
      ↪c314c1d6777942876503fa1482c82240.jpg')

      img_resized = cv2.resize(img, img_size)
      img_expanded = np.expand_dims(img_resized, axis=0)

      yhat = model.predict(img_expanded)
      predicted_class = tf.argmax(yhat, axis=1).numpy()[0]

      plt.imshow(img)
      plt.title(f'Predicted class: {predicted_class}')
      plt.axis('off')
      plt.show()
```

1/1 [=====] - 2s 2s/step

Predicted class: 2



```
[15]: print(f'Predicted class is: {class_names[predicted_class]}')
      for idx, prob in enumerate(yhat[0]):
          print(f"Model probability for {class_names[idx]} is {prob * 100:.2f}%")
```

Predicted class is: Hatchback
 Model probability for Convertible is 0.00%
 Model probability for Coupe is 0.00%
 Model probability for Hatchback is 100.00%
 Model probability for Pick-Up is 0.00%
 Model probability for SUV is 0.00%
 Model probability for Sedan is 0.00%
 Model probability for VAN is 0.00%

```
[16]: model_file_name = f"CarStyle{acc.result().numpy() * 100 : .2f}% EfficientNetB7.
      ↪h5"
      model.save(os.path.join('CarBackEnd/models/CarStyles', model_file_name))
```

```
-----
TypeError                                Traceback (most recent call last)
Cell In[16], line 2
      1 model_file_name = f"CarStyle{acc.result().numpy() * 100 : .2f}%
      ↪EfficientNetB7.h5"
----> 2 model.save(os.path.join('CarBackEnd/models/CarStyles', model_file_name))
```

```
File ~\anaconda3\envs\py310\lib\site-packages\keras\utils\traceback_utils.py:70
      ↪in filter_traceback.<locals>.error_handler(*args, **kwargs)
    67     filtered_tb = _process_traceback_frames(e.__traceback__)
    68     # To get the full stack trace, call:
    69     # `tf.debugging.disable_traceback_filtering()`
    ---> 70     raise e.with_traceback(filtered_tb) from None
    71 finally:
    72     del filtered_tb
```

```
File ~\anaconda3\envs\py310\lib\json\__init__.py:238, in dumps(obj, skipkeys,
      ↪ensure_ascii, check_circular, allow_nan, cls, indent, separators, default,
      ↪sort_keys, **kw)
    232 if cls is None:
    233     cls = JSONEncoder
    234 return cls(
    235     skipkeys=skipkeys, ensure_ascii=ensure_ascii,
    236     check_circular=check_circular, allow_nan=allow_nan, indent=indent,
    237     separators=separators, default=default, sort_keys=sort_keys,
    --> 238     **kw).encode(obj)
```

```
File ~\anaconda3\envs\py310\lib\json\encoder.py:199, in JSONEncoder.encode(self
      ↪o)
    195     return encode_basestring(o)
    196 # This doesn't pass the iterator directly to ''.join() because the
    197 # exceptions aren't as detailed. The list call should be roughly
    198 # equivalent to the PySequence_Fast that ''.join() would do.
    --> 199 chunks = self.iterencode(o, _one_shot=True)
    200 if not isinstance(chunks, (list, tuple)):
```



```
201     chunks = list(chunks)
```

File ~\anaconda3\envs\py310\lib\json\encoder.py:257, in JSONEncoder.

```
↪iterencode(self, o, _one_shot)
    252 else:
    253     _iterencode = _make_iterencode(
    254         markers, self.default, _encoder, self.indent, floatstr,
    255         self.key_separator, self.item_separator, self.sort_keys,
    256         self.skipkeys, _one_shot)
--> 257 return _iterencode(o, 0)
```

TypeError: Unable to serialize [2.0896919 2.1128857 2.1081853] to JSON.
↪Unrecognized type <class 'tensorflow.python.framework.ops.EagerTensor'>.

[]: