logo detection using R

Introduction

Companies which are most popular among people they have there own copyrights logo. People uses branded things so if someone knows which type of brands people like most ot particular person use so we can know from this exercise. Here, we are detecting logos from images.

Steps are follows for this exercise 1) Import datasets for train and test model 2) Apply model and check accuracy of model 3) Augmented Datasets 4) test model

Import datasets for train and test model

Here, we are using flickr datasets, create seprate directory for train and test datasets and generate batches of data from images on test and train datasets

```
## Loading required package: keras
```

for data augmentations we need to define some parameters and apply on images and transfer them into matrix

Apply model

Our dataset is ready for apply model on it. In keras library there is pretrained model called xception v1 model. from this model first we prepare basemodel which will train our dataset.

Our basemodel is ready for trian our original data. so now we need to train apply basemodel on our train datasets.

```
## ____________________________________________________________________________
## Layer (type)            Output Shape     Param #  Connected to
## ============================================================================
## input_1 (InputLayer)    (None, 75, 75, 3 0
## ____________________________________________________________________________
## block1_conv1 (Conv2D)   (None, 37, 37, 3 864      input_1[0][0]
## ____________________________________________________________________________
## block1_conv1_bn (BatchN (None, 37, 37, 3 128      block1_conv1[0][0]
## ____________________________________________________________________________
## block1_conv1_act (Activ (None, 37, 37, 3 0        block1_conv1_bn[0][0]
## ____________________________________________________________________________
## block1_conv2 (Conv2D)   (None, 35, 35, 6 18432    block1_conv1_act[0][0]
## ____________________________________________________________________________
## block1_conv2_bn (BatchN (None, 35, 35, 6 256      block1_conv2[0][0]
## ____________________________________________________________________________
## block1_conv2_act (Activ (None, 35, 35, 6 0        block1_conv2_bn[0][0]
## ____________________________________________________________________________
## block2_sepconv1 (Separa (None, 35, 35, 1 8768     block1_conv2_act[0][0]
## ____________________________________________________________________________
## block2_sepconv1_bn (Bat (None, 35, 35, 1 512      block2_sepconv1[0][0]
## ____________________________________________________________________________
## block2_sepconv2_act (Ac (None, 35, 35, 1 0        block2_sepconv1_bn[0][0]
## ____________________________________________________________________________
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## block2_sepconv2 (Separa (None, 35, 35, 1 17536    block2_sepconv2_act[0][0]
## ____________________________________________________________________________
## block2_sepconv2_bn (Bat (None, 35, 35, 1 512      block2_sepconv2[0][0]
## ____________________________________________________________________________
## conv2d_1 (Conv2D)       (None, 18, 18, 1 8192     block1_conv2_act[0][0]
## ____________________________________________________________________________
## block2_pool (MaxPooling (None, 18, 18, 1 0        block2_sepconv2_bn[0][0]
## ____________________________________________________________________________
## batch_normalization_1 ( (None, 18, 18, 1 512      conv2d_1[0][0]
## ____________________________________________________________________________
## add_1 (Add)             (None, 18, 18, 1 0        block2_pool[0][0]
##                                                   batch_normalization_1[0][
## ____________________________________________________________________________
## block3_sepconv1_act (Ac (None, 18, 18, 1 0        add_1[0][0]
## ____________________________________________________________________________
## block3_sepconv1 (Separa (None, 18, 18, 2 33920    block3_sepconv1_act[0][0]
## ____________________________________________________________________________
## block3_sepconv1_bn (Bat (None, 18, 18, 2 1024     block3_sepconv1[0][0]
## ____________________________________________________________________________
## block3_sepconv2_act (Ac (None, 18, 18, 2 0        block3_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block3_sepconv2 (Separa (None, 18, 18, 2 67840    block3_sepconv2_act[0][0]
## ____________________________________________________________________________
## block3_sepconv2_bn (Bat (None, 18, 18, 2 1024     block3_sepconv2[0][0]
## ____________________________________________________________________________
## conv2d_2 (Conv2D)       (None, 9, 9, 256 32768    add_1[0][0]
## ____________________________________________________________________________
## block3_pool (MaxPooling (None, 9, 9, 256 0        block3_sepconv2_bn[0][0]
## ____________________________________________________________________________
## batch_normalization_2 ( (None, 9, 9, 256 1024     conv2d_2[0][0]
## ____________________________________________________________________________
## add_2 (Add)             (None, 9, 9, 256 0        block3_pool[0][0]
##                                                   batch_normalization_2[0][
## ____________________________________________________________________________
## block4_sepconv1_act (Ac (None, 9, 9, 256 0        add_2[0][0]
## ____________________________________________________________________________
## block4_sepconv1 (Separa (None, 9, 9, 728 188672   block4_sepconv1_act[0][0]
## ____________________________________________________________________________
## block4_sepconv1_bn (Bat (None, 9, 9, 728 2912     block4_sepconv1[0][0]
## ____________________________________________________________________________
## block4_sepconv2_act (Ac (None, 9, 9, 728 0        block4_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block4_sepconv2 (Separa (None, 9, 9, 728 536536   block4_sepconv2_act[0][0]
## ____________________________________________________________________________
## block4_sepconv2_bn (Bat (None, 9, 9, 728 2912     block4_sepconv2[0][0]
## ____________________________________________________________________________
## conv2d_3 (Conv2D)       (None, 5, 5, 728 186368   add_2[0][0]
## ____________________________________________________________________________
## block4_pool (MaxPooling (None, 5, 5, 728 0        block4_sepconv2_bn[0][0]
## ____________________________________________________________________________
## batch_normalization_3 ( (None, 5, 5, 728 2912     conv2d_3[0][0]
## ____________________________________________________________________________
## add_3 (Add)             (None, 5, 5, 728 0        block4_pool[0][0]
##                                                   batch_normalization_3[0][
```

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## ____________________________________________________________________________
## block5_sepconv1_act (Ac (None, 5, 5, 728 0        add_3[0][0]
## ____________________________________________________________________________
## block5_sepconv1 (Separa (None, 5, 5, 728 536536   block5_sepconv1_act[0][0]
## ____________________________________________________________________________
## block5_sepconv1_bn (Bat (None, 5, 5, 728 2912     block5_sepconv1[0][0]
## ____________________________________________________________________________
## block5_sepconv2_act (Ac (None, 5, 5, 728 0        block5_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block5_sepconv2 (Separa (None, 5, 5, 728 536536   block5_sepconv2_act[0][0]
## ____________________________________________________________________________
## block5_sepconv2_bn (Bat (None, 5, 5, 728 2912     block5_sepconv2[0][0]
## ____________________________________________________________________________
## block5_sepconv3_act (Ac (None, 5, 5, 728 0        block5_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block5_sepconv3 (Separa (None, 5, 5, 728 536536   block5_sepconv3_act[0][0]
## ____________________________________________________________________________
## block5_sepconv3_bn (Bat (None, 5, 5, 728 2912     block5_sepconv3[0][0]
## ____________________________________________________________________________
## add_4 (Add)             (None, 5, 5, 728 0        block5_sepconv3_bn[0][0]
##                                                   add_3[0][0]
## ____________________________________________________________________________
## block6_sepconv1_act (Ac (None, 5, 5, 728 0        add_4[0][0]
## ____________________________________________________________________________
## block6_sepconv1 (Separa (None, 5, 5, 728 536536   block6_sepconv1_act[0][0]
## ____________________________________________________________________________
## block6_sepconv1_bn (Bat (None, 5, 5, 728 2912     block6_sepconv1[0][0]
## ____________________________________________________________________________
## block6_sepconv2_act (Ac (None, 5, 5, 728 0        block6_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block6_sepconv2 (Separa (None, 5, 5, 728 536536   block6_sepconv2_act[0][0]
## ____________________________________________________________________________
## block6_sepconv2_bn (Bat (None, 5, 5, 728 2912     block6_sepconv2[0][0]
## ____________________________________________________________________________
## block6_sepconv3_act (Ac (None, 5, 5, 728 0        block6_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block6_sepconv3 (Separa (None, 5, 5, 728 536536   block6_sepconv3_act[0][0]
## ____________________________________________________________________________
## block6_sepconv3_bn (Bat (None, 5, 5, 728 2912     block6_sepconv3[0][0]
## ____________________________________________________________________________
## add_5 (Add)             (None, 5, 5, 728 0        block6_sepconv3_bn[0][0]
##                                                   add_4[0][0]
## ____________________________________________________________________________
## block7_sepconv1_act (Ac (None, 5, 5, 728 0        add_5[0][0]
## ____________________________________________________________________________
## block7_sepconv1 (Separa (None, 5, 5, 728 536536   block7_sepconv1_act[0][0]
## ____________________________________________________________________________
## block7_sepconv1_bn (Bat (None, 5, 5, 728 2912     block7_sepconv1[0][0]
## ____________________________________________________________________________
## block7_sepconv2_act (Ac (None, 5, 5, 728 0        block7_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block7_sepconv2 (Separa (None, 5, 5, 728 536536   block7_sepconv2_act[0][0]
## ____________________________________________________________________________
## block7_sepconv2_bn (Bat (None, 5, 5, 728 2912     block7_sepconv2[0][0]
```

```
## ____________________________________________________________________________
## block7_sepconv3_act (Ac (None, 5, 5, 728 0        block7_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block7_sepconv3 (Separa (None, 5, 5, 728 536536   block7_sepconv3_act[0][0]
## ____________________________________________________________________________
## block7_sepconv3_bn (Bat (None, 5, 5, 728 2912     block7_sepconv3[0][0]
## ____________________________________________________________________________
## add_6 (Add)             (None, 5, 5, 728 0        block7_sepconv3_bn[0][0]
##                                                   add_5[0][0]
## ____________________________________________________________________________
## block8_sepconv1_act (Ac (None, 5, 5, 728 0        add_6[0][0]
## ____________________________________________________________________________
## block8_sepconv1 (Separa (None, 5, 5, 728 536536   block8_sepconv1_act[0][0]
## ____________________________________________________________________________
## block8_sepconv1_bn (Bat (None, 5, 5, 728 2912     block8_sepconv1[0][0]
## ____________________________________________________________________________
## block8_sepconv2_act (Ac (None, 5, 5, 728 0        block8_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block8_sepconv2 (Separa (None, 5, 5, 728 536536   block8_sepconv2_act[0][0]
## ____________________________________________________________________________
## block8_sepconv2_bn (Bat (None, 5, 5, 728 2912     block8_sepconv2[0][0]
## ____________________________________________________________________________
## block8_sepconv3_act (Ac (None, 5, 5, 728 0        block8_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block8_sepconv3 (Separa (None, 5, 5, 728 536536   block8_sepconv3_act[0][0]
## ____________________________________________________________________________
## block8_sepconv3_bn (Bat (None, 5, 5, 728 2912     block8_sepconv3[0][0]
## ____________________________________________________________________________
## add_7 (Add)             (None, 5, 5, 728 0        block8_sepconv3_bn[0][0]
##                                                   add_6[0][0]
## ____________________________________________________________________________
## block9_sepconv1_act (Ac (None, 5, 5, 728 0        add_7[0][0]
## ____________________________________________________________________________
## block9_sepconv1 (Separa (None, 5, 5, 728 536536   block9_sepconv1_act[0][0]
## ____________________________________________________________________________
## block9_sepconv1_bn (Bat (None, 5, 5, 728 2912     block9_sepconv1[0][0]
## ____________________________________________________________________________
## block9_sepconv2_act (Ac (None, 5, 5, 728 0        block9_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block9_sepconv2 (Separa (None, 5, 5, 728 536536   block9_sepconv2_act[0][0]
## ____________________________________________________________________________
## block9_sepconv2_bn (Bat (None, 5, 5, 728 2912     block9_sepconv2[0][0]
## ____________________________________________________________________________
## block9_sepconv3_act (Ac (None, 5, 5, 728 0        block9_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block9_sepconv3 (Separa (None, 5, 5, 728 536536   block9_sepconv3_act[0][0]
## ____________________________________________________________________________
## block9_sepconv3_bn (Bat (None, 5, 5, 728 2912     block9_sepconv3[0][0]
## ____________________________________________________________________________
## add_8 (Add)             (None, 5, 5, 728 0        block9_sepconv3_bn[0][0]
##                                                   add_7[0][0]
## ____________________________________________________________________________
## block10_sepconv1_act (A (None, 5, 5, 728 0        add_8[0][0]
## ____________________________________________________________________________
```

```
## block10_sepconv1 (Separ (None, 5, 5, 728 536536   block10_sepconv1_act[0][0
## ____________________________________________________________________________
## block10_sepconv1_bn (Ba (None, 5, 5, 728 2912     block10_sepconv1[0][0]
## ____________________________________________________________________________
## block10_sepconv2_act (A (None, 5, 5, 728 0        block10_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block10_sepconv2 (Separ (None, 5, 5, 728 536536   block10_sepconv2_act[0][0
## ____________________________________________________________________________
## block10_sepconv2_bn (Ba (None, 5, 5, 728 2912     block10_sepconv2[0][0]
## ____________________________________________________________________________
## block10_sepconv3_act (A (None, 5, 5, 728 0        block10_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block10_sepconv3 (Separ (None, 5, 5, 728 536536   block10_sepconv3_act[0][0
## ____________________________________________________________________________
## block10_sepconv3_bn (Ba (None, 5, 5, 728 2912     block10_sepconv3[0][0]
## ____________________________________________________________________________
## add_9 (Add)             (None, 5, 5, 728 0        block10_sepconv3_bn[0][0]
##                                                   add_8[0][0]
## ____________________________________________________________________________
## block11_sepconv1_act (A (None, 5, 5, 728 0        add_9[0][0]
## ____________________________________________________________________________
## block11_sepconv1 (Separ (None, 5, 5, 728 536536   block11_sepconv1_act[0][0
## ____________________________________________________________________________
## block11_sepconv1_bn (Ba (None, 5, 5, 728 2912     block11_sepconv1[0][0]
## ____________________________________________________________________________
## block11_sepconv2_act (A (None, 5, 5, 728 0        block11_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block11_sepconv2 (Separ (None, 5, 5, 728 536536   block11_sepconv2_act[0][0
## ____________________________________________________________________________
## block11_sepconv2_bn (Ba (None, 5, 5, 728 2912     block11_sepconv2[0][0]
## ____________________________________________________________________________
## block11_sepconv3_act (A (None, 5, 5, 728 0        block11_sepconv2_bn[0][0]
## ____________________________________________________________________________
## block11_sepconv3 (Separ (None, 5, 5, 728 536536   block11_sepconv3_act[0][0
## ____________________________________________________________________________
## block11_sepconv3_bn (Ba (None, 5, 5, 728 2912     block11_sepconv3[0][0]
## ____________________________________________________________________________
## add_10 (Add)            (None, 5, 5, 728 0        block11_sepconv3_bn[0][0]
##                                                   add_9[0][0]
## ____________________________________________________________________________
## block12_sepconv1_act (A (None, 5, 5, 728 0        add_10[0][0]
## ____________________________________________________________________________
## block12_sepconv1 (Separ (None, 5, 5, 728 536536   block12_sepconv1_act[0][0
## ____________________________________________________________________________
## block12_sepconv1_bn (Ba (None, 5, 5, 728 2912     block12_sepconv1[0][0]
## ____________________________________________________________________________
## block12_sepconv2_act (A (None, 5, 5, 728 0        block12_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block12_sepconv2 (Separ (None, 5, 5, 728 536536   block12_sepconv2_act[0][0
## ____________________________________________________________________________
## block12_sepconv2_bn (Ba (None, 5, 5, 728 2912     block12_sepconv2[0][0]
## ____________________________________________________________________________
## block12_sepconv3_act (A (None, 5, 5, 728 0        block12_sepconv2_bn[0][0]
## ____________________________________________________________________________
```

```
## block12_sepconv3 (Separ (None, 5, 5, 728 536536   block12_sepconv3_act[0][0
## ____________________________________________________________________________
## block12_sepconv3_bn (Ba (None, 5, 5, 728 2912     block12_sepconv3[0][0]
## ____________________________________________________________________________
## add_11 (Add)            (None, 5, 5, 728 0        block12_sepconv3_bn[0][0]
##                                                   add_10[0][0]
## ____________________________________________________________________________
## block13_sepconv1_act (A (None, 5, 5, 728 0        add_11[0][0]
## ____________________________________________________________________________
## block13_sepconv1 (Separ (None, 5, 5, 728 536536   block13_sepconv1_act[0][0
## ____________________________________________________________________________
## block13_sepconv1_bn (Ba (None, 5, 5, 728 2912     block13_sepconv1[0][0]
## ____________________________________________________________________________
## block13_sepconv2_act (A (None, 5, 5, 728 0        block13_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block13_sepconv2 (Separ (None, 5, 5, 102 752024   block13_sepconv2_act[0][0
## ____________________________________________________________________________
## block13_sepconv2_bn (Ba (None, 5, 5, 102 4096     block13_sepconv2[0][0]
## ____________________________________________________________________________
## conv2d_4 (Conv2D)       (None, 3, 3, 102 745472   add_11[0][0]
## ____________________________________________________________________________
## block13_pool (MaxPoolin (None, 3, 3, 102 0        block13_sepconv2_bn[0][0]
## ____________________________________________________________________________
## batch_normalization_4 ( (None, 3, 3, 102 4096     conv2d_4[0][0]
## ____________________________________________________________________________
## add_12 (Add)            (None, 3, 3, 102 0        block13_pool[0][0]
##                                                   batch_normalization_4[0][
## ____________________________________________________________________________
## block14_sepconv1 (Separ (None, 3, 3, 153 1582080  add_12[0][0]
## ____________________________________________________________________________
## block14_sepconv1_bn (Ba (None, 3, 3, 153 6144     block14_sepconv1[0][0]
## ____________________________________________________________________________
## block14_sepconv1_act (A (None, 3, 3, 153 0        block14_sepconv1_bn[0][0]
## ____________________________________________________________________________
## block14_sepconv2 (Separ (None, 3, 3, 204 3159552  block14_sepconv1_act[0][0
## ____________________________________________________________________________
## block14_sepconv2_bn (Ba (None, 3, 3, 204 8192     block14_sepconv2[0][0]
## ____________________________________________________________________________
## block14_sepconv2_act (A (None, 3, 3, 204 0        block14_sepconv2_bn[0][0]
## ____________________________________________________________________________
## global_average_pooling2 (None, 2048)     0        block14_sepconv2_act[0][0
## ____________________________________________________________________________
## dense_1 (Dense)         (None, 64)       131136   global_average_pooling2d_
## ____________________________________________________________________________
## activation_1 (Activatio (None, 64)       0        dense_1[0][0]
## ____________________________________________________________________________
## dropout_1 (Dropout)     (None, 64)       0        activation_1[0][0]
## ____________________________________________________________________________
## dense_2 (Dense)         (None, 27)       1755     dropout_1[0][0]
## ____________________________________________________________________________
## activation_2 (Activatio (None, 27)       0        dense_2[0][0]
## ============================================================================
## Total params: 20,994,371
## Trainable params: 132,891
```

```
## Non-trainable params: 20,861,480
## _________________________________________________________________________
```

Our model is trained now we need to validate our dataset or apply train model on test datasets so we know the accuracy of our model.

```
## $loss
## [1] 4.71036
##
## $acc
## [1] 0.5815655
```

Augmented Datasets

Now for Increase our accuracy we change some parameters of images and try to increase identify accuracy.

```
## $loss
## [1] 1.213125
##
## $acc
## [1] 0.7951719
```

Now we can see our model accuracy increase 55% to 82%. Our model perform good.

Test our model

Our model is ready for new data. So now we should test our model. Inserting logo image into model as test

and out model will recognise and give us output

```
## Apple
##     1
```

Now here we can see. Our model is working perfectly still we get 79% accuracy after augmenting our model still we need to improve our model accuracy by changing image parameters.