

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:66: The name tf.get_default_graph is deprecated. Please use tf.compat.v1.get_default_graph instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:541: The name tf.placeholder is deprecated. Please use tf.compat.v1.placeholder instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:4432: The name tf.random_uniform is deprecated. Please use tf.random.uniform instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:4267: The name tf.nn.max_pool is deprecated. Please use tf.nn.max_pool_v2 instead.

Downloading data from https://github.com/fchollet/deep-learning-models/releases/download/v0.1/vgg16_weights_tf_dim_ordering_58892288/58889256 [=====] - 1s 0us/step

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:216: The name tf.is_variable_initialized is deprecated. Please use tf.compat.v1.is_variable_initialized instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:223: The name tf.variable_shape is deprecated. Please use tf.compat.v1.get_shape instead.

```

=====
Experimento VGG16-1
experimento = Experimento VGG16-1
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100
number_of_classes = 102
optimizador = rmsprop
clasificador = VGG16-1
batch_size = 128
epochs = 10
run_experiment = True
-----
Creando sub-conjunto de datos con 102 clases y 100 muestras por clase
number_of_classes: 102
Sub-conjunto con 102 clases creado.
Cantidad de muestras: 6398
Creando datos de train, validate y test ...
Datos de train, validate y test creados.

Split de Entrenamiento, Validación y prueba: 4478, 960, 960
Número de clases: 102
Número de muestras: 100
Usando rmsprop
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/optimizers.py:793: The name tf.train.Optimizer is deprecated. Please use tf.compat.v1.train.Optimizer instead.

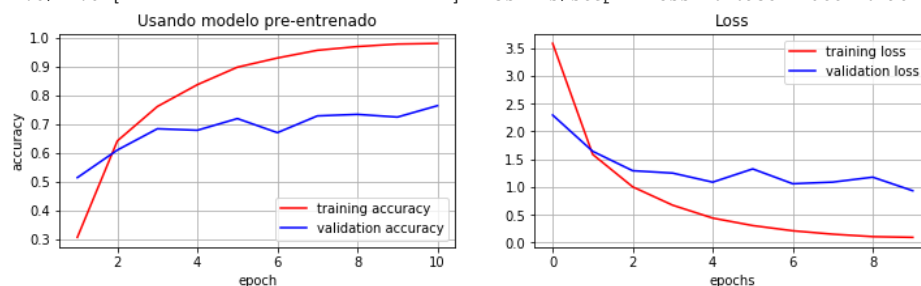
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:3576: The name tf.log is deprecated. Please use tf.math.log instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow_core/python/ops/math_grad.py:1424: where (from tensorflow_core/python/ops/math_grad.py:1424) is deprecated and will be removed in a future version. Use tf.where in 2.0, which has the same broadcast rule as np.where.
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:1033: The name tf.assign is deprecated. Please use tf.compat.v1.assign instead.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:1020: The name tf.assign is deprecated. Please use tf.compat.v1.assign instead.

Train on 4478 samples, validate on 960 samples
Epoch 1/10
4478/4478 [=====] - 14s 3ms/step - loss: 3.5819 - acc: 0.3071 - val_loss: 2.2936 - val_acc: 0.5146
Epoch 2/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.5868 - acc: 0.6423 - val_loss: 1.6424 - val_acc: 0.6104
Epoch 3/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.0029 - acc: 0.7617 - val_loss: 1.2930 - val_acc: 0.6844
Epoch 4/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.6731 - acc: 0.8377 - val_loss: 1.2504 - val_acc: 0.6792
Epoch 5/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.4413 - acc: 0.8984 - val_loss: 1.0873 - val_acc: 0.7198
Epoch 6/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.3070 - acc: 0.9303 - val_loss: 1.3256 - val_acc: 0.6708
Epoch 7/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.2131 - acc: 0.9571 - val_loss: 1.0589 - val_acc: 0.7292
Epoch 8/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.1518 - acc: 0.9701 - val_loss: 1.0883 - val_acc: 0.7344
Epoch 9/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.1079 - acc: 0.9788 - val_loss: 1.1770 - val_acc: 0.7250
Epoch 10/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.0953 - acc: 0.9810 - val_loss: 0.9329 - val_acc: 0.7646

```



Exactitud en subconjunto de test:
Test loss: 0.826099677880605
Test accuracy: 0.7916666666666666

Exactitud en todo el dataset:
Test loss: 0.41863870030140965
Test accuracy: 0.8999453253143794

```

=====
Experimento VGG16-2
experimento = Experimento VGG16-2
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100

```

```

number_of_classes = 102
optimizador = rmsprop
clasificador = VGG16-2
batch_size = 128
epochs = 10
run_experiment = True

```

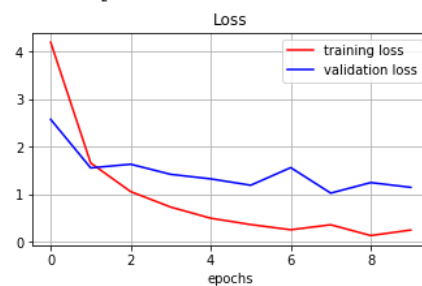
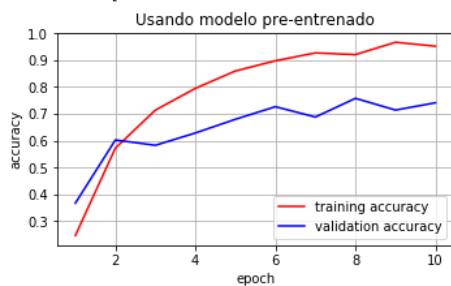
Número de clases: 102
Número de muestras: 100
Usando rmsprop

Train on 4478 samples, validate on 960 samples

```

Epoch 1/10
4478/4478 [=====] - 6s 1ms/step - loss: 4.1919 - acc: 0.2461 - val_loss: 2.5728 - val_acc: 0.3667
Epoch 2/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.6574 - acc: 0.5717 - val_loss: 1.5544 - val_acc: 0.6021
Epoch 3/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.0566 - acc: 0.7133 - val_loss: 1.6314 - val_acc: 0.5823
Epoch 4/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.7323 - acc: 0.7943 - val_loss: 1.4193 - val_acc: 0.6281
Epoch 5/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.4984 - acc: 0.8591 - val_loss: 1.3239 - val_acc: 0.6792
Epoch 6/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.3646 - acc: 0.8971 - val_loss: 1.1904 - val_acc: 0.7260
Epoch 7/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.2559 - acc: 0.9265 - val_loss: 1.5605 - val_acc: 0.6875
Epoch 8/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.3603 - acc: 0.9201 - val_loss: 1.0253 - val_acc: 0.7573
Epoch 9/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.1345 - acc: 0.9661 - val_loss: 1.2461 - val_acc: 0.7135
Epoch 10/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.2498 - acc: 0.9515 - val_loss: 1.1467 - val_acc: 0.7406

```



Exactitud en subconjunto de test:
Test loss: 0.9612103035052617
Test accuracy: 0.7854166666666667

Exactitud en todo el dataset:
Test loss: 0.4306638018210168
Test accuracy: 0.9070530343863924

=====

```

Experimento VGG16-3
experimento = Experimento VGG16-3
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100
number_of_classes = 102
optimizador = rmsprop
clasificador = VGG16-3
batch_size = 128
epochs = 10
run_experiment = True

```

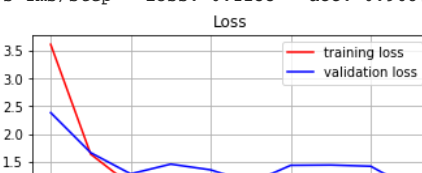
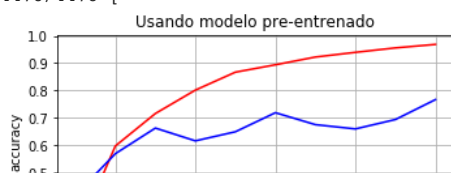
Número de clases: 102
Número de muestras: 100
Usando rmsprop

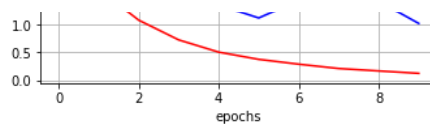
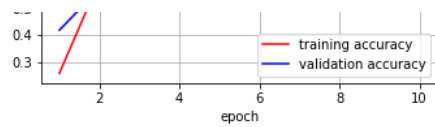
Train on 4478 samples, validate on 960 samples

```

Epoch 1/10
4478/4478 [=====] - 5s 1ms/step - loss: 3.6097 - acc: 0.2588 - val_loss: 2.3834 - val_acc: 0.4167
Epoch 2/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.6374 - acc: 0.5969 - val_loss: 1.6633 - val_acc: 0.5687
Epoch 3/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.0798 - acc: 0.7157 - val_loss: 1.2812 - val_acc: 0.6625
Epoch 4/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.7246 - acc: 0.8015 - val_loss: 1.4575 - val_acc: 0.6156
Epoch 5/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.5046 - acc: 0.8671 - val_loss: 1.3544 - val_acc: 0.6490
Epoch 6/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.3745 - acc: 0.8941 - val_loss: 1.1185 - val_acc: 0.7188
Epoch 7/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.2878 - acc: 0.9225 - val_loss: 1.4362 - val_acc: 0.6750
Epoch 8/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.2100 - acc: 0.9397 - val_loss: 1.4413 - val_acc: 0.6594
Epoch 9/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.1663 - acc: 0.9560 - val_loss: 1.4200 - val_acc: 0.6937
Epoch 10/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.1233 - acc: 0.9687 - val_loss: 1.0202 - val_acc: 0.7667

```



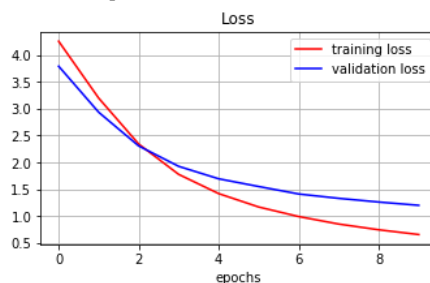
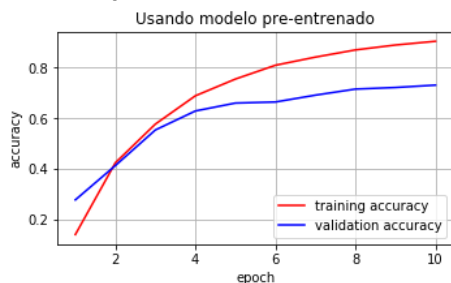


Exactitud en subconjunto de test:
 Test loss: 0.8771930128335953
 Test accuracy: 0.7864583333333334

Exactitud en todo el dataset:
 Test loss: 0.48329648602922043
 Test accuracy: 0.8857299069943748

```
=====
Experimento VGG16-4
experimento = Experimento VGG16-4
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = VGG16-1
batch_size = 128
epochs = 10
run_experiment = True
=====
```

```
Número de clases: 102
Número de muestras: 100
Usando Adam
Train on 4478 samples, validate on 960 samples
Epoch 1/10
4478/4478 [=====] - 5s 1ms/step - loss: 4.2537 - acc: 0.1402 - val_loss: 3.7894 - val_acc: 0.2771
Epoch 2/10
4478/4478 [=====] - 5s 1ms/step - loss: 3.1961 - acc: 0.4236 - val_loss: 2.9330 - val_acc: 0.4125
Epoch 3/10
4478/4478 [=====] - 5s 1ms/step - loss: 2.3414 - acc: 0.5764 - val_loss: 2.3060 - val_acc: 0.5531
Epoch 4/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.7767 - acc: 0.6880 - val_loss: 1.9263 - val_acc: 0.6281
Epoch 5/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.4188 - acc: 0.7541 - val_loss: 1.6945 - val_acc: 0.6594
Epoch 6/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.1697 - acc: 0.8086 - val_loss: 1.5509 - val_acc: 0.6635
Epoch 7/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.9918 - acc: 0.8408 - val_loss: 1.4116 - val_acc: 0.6906
Epoch 8/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.8523 - acc: 0.8691 - val_loss: 1.3309 - val_acc: 0.7146
Epoch 9/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.7457 - acc: 0.8886 - val_loss: 1.2621 - val_acc: 0.7208
Epoch 10/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.6573 - acc: 0.9033 - val_loss: 1.2010 - val_acc: 0.7302
```



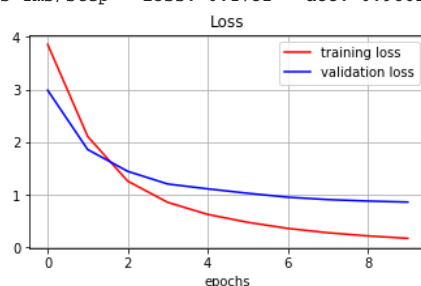
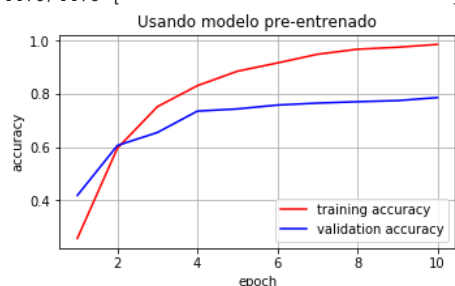
Exactitud en subconjunto de test:
 Test loss: 1.088756416241328
 Test accuracy: 0.7770833333333333

Exactitud en todo el dataset:
 Test loss: 0.7682466194106947
 Test accuracy: 0.8625478402912584

```
=====
Experimento VGG16-5
experimento = Experimento VGG16-5
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = VGG16-2
batch_size = 128
epochs = 10
run_experiment = True
=====
```

```
Número de clases: 102
Número de muestras: 100
Usando Adam
Train on 4478 samples, validate on 960 samples
Epoch 1/10
4478/4478 [=====] - 6s 1ms/step - loss: 3.8581 - acc: 0.2575 - val_loss: 2.9874 - val_acc: 0.4188
Epoch 2/10
4478/4478 [=====] - 5s 1ms/step - loss: 2.1098 - acc: 0.5960 - val_loss: 1.8606 - val_acc: 0.6062
Epoch 3/10
4478/4478 [=====] - 5s 1ms/step - loss: 1.2607 - acc: 0.7521 - val_loss: 1.4467 - val_acc: 0.6552
Epoch 4/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.8572 - acc: 0.8312 - val_loss: 1.2057 - val_acc: 0.7354
Epoch 5/10
4478/4478 [=====] - 5s 1ms/step - loss: 0.6279 - acc: 0.8854 - val_loss: 1.1134 - val_acc: 0.7438
```

Epoch 6/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.4780 - acc: 0.9165 - val_loss: 1.0297 - val_acc: 0.7583
 Epoch 7/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.3620 - acc: 0.9491 - val_loss: 0.9544 - val_acc: 0.7656
 Epoch 8/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.2794 - acc: 0.9681 - val_loss: 0.9096 - val_acc: 0.7708
 Epoch 9/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.2192 - acc: 0.9754 - val_loss: 0.8816 - val_acc: 0.7750
 Epoch 10/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.1732 - acc: 0.9862 - val_loss: 0.8624 - val_acc: 0.7865



Exactitud en subconjunto de test:
 Test loss: 0.7812225192785263
 Test accuracy: 0.7916666666666666

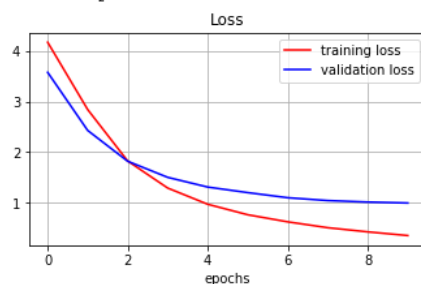
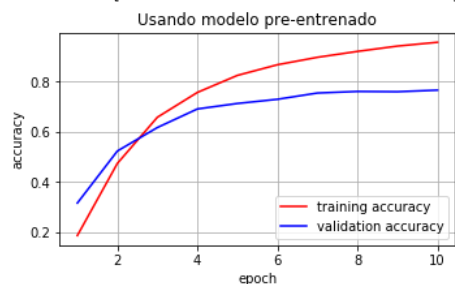
Exactitud en todo el dataset:
 Test loss: 0.44634470026624407
 Test accuracy: 0.9002733733694432

```
=====
Experimento VGG16-6
experimento = Experimento VGG16-6
model = <keras.engine.training.Model object at 0x7fa806300a58>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = VGG16-3
batch_size = 128
epochs = 10
run_experiment = True
```

 Número de clases: 102
 Número de muestras: 100

Usando Adam
 Train on 4478 samples, validate on 960 samples

Epoch 1/10
 4478/4478 [=====] - 6s 1ms/step - loss: 4.1779 - acc: 0.1851 - val_loss: 3.5817 - val_acc: 0.3146
 Epoch 2/10
 4478/4478 [=====] - 5s 1ms/step - loss: 2.8440 - acc: 0.4725 - val_loss: 2.4297 - val_acc: 0.5219
 Epoch 3/10
 4478/4478 [=====] - 5s 1ms/step - loss: 1.8241 - acc: 0.6565 - val_loss: 1.8190 - val_acc: 0.6156
 Epoch 4/10
 4478/4478 [=====] - 5s 1ms/step - loss: 1.2876 - acc: 0.7555 - val_loss: 1.4999 - val_acc: 0.6896
 Epoch 5/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.9662 - acc: 0.8234 - val_loss: 1.3072 - val_acc: 0.7115
 Epoch 6/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.7582 - acc: 0.8658 - val_loss: 1.1972 - val_acc: 0.7281
 Epoch 7/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.6174 - acc: 0.8955 - val_loss: 1.0955 - val_acc: 0.7531
 Epoch 8/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.5011 - acc: 0.9189 - val_loss: 1.0394 - val_acc: 0.7594
 Epoch 9/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.4187 - acc: 0.9402 - val_loss: 1.0101 - val_acc: 0.7583
 Epoch 10/10
 4478/4478 [=====] - 5s 1ms/step - loss: 0.3459 - acc: 0.9553 - val_loss: 0.9913 - val_acc: 0.7646



Exactitud en subconjunto de test:
 Test loss: 0.8872637708981832
 Test accuracy: 0.7927083333333333

Exactitud en todo el dataset:
 Test loss: 0.5428321770154563
 Test accuracy: 0.8882449425329205