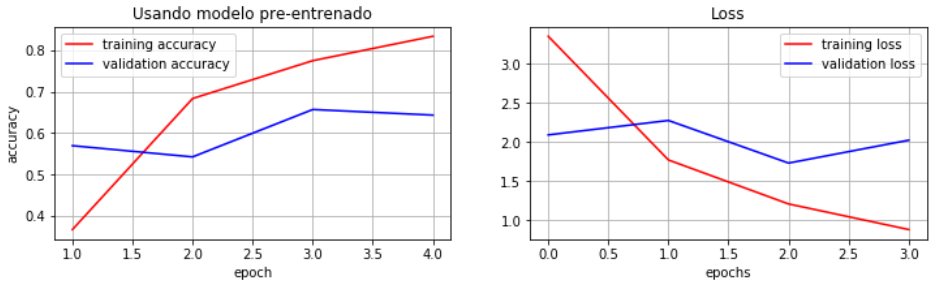
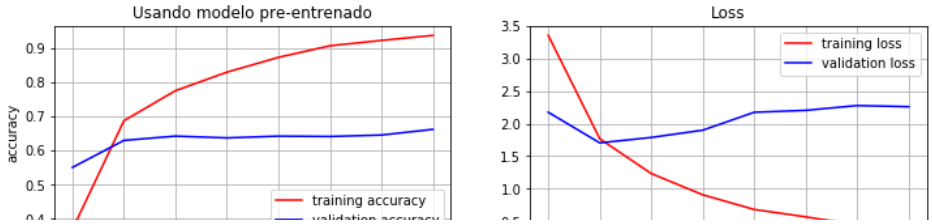
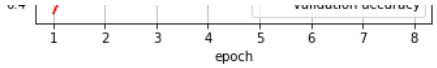
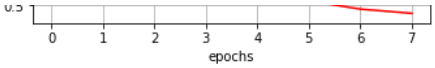
```
============================================================
Experimento Xception 8a
experimento = Experimento Xception 8a
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = rmsprop
clasificador = XCEPTION-2
batch_size = 128
epochs = 4
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
Train on 4478 samples, validate on 960 samples
Epoch 1/4
4478/4478 [==============================] - 27s 6ms/step - loss: 3.3524 - acc: 0.3671 - val_loss: 2.0908 - val_acc: 0.5698
Epoch 2/4
4478/4478 [==============================] - 6s 1ms/step - loss: 1.7701 - acc: 0.6838 - val_loss: 2.2754 - val_acc: 0.5427
Epoch 3/4
4478/4478 [==============================] - 6s 1ms/step - loss: 1.2073 - acc: 0.7753 - val_loss: 1.7303 - val_acc: 0.6573
Epoch 4/4
4478/4478 [==============================] - 6s 1ms/step - loss: 0.8799 - acc: 0.8343 - val_loss: 2.0230 - val_acc: 0.6438
```



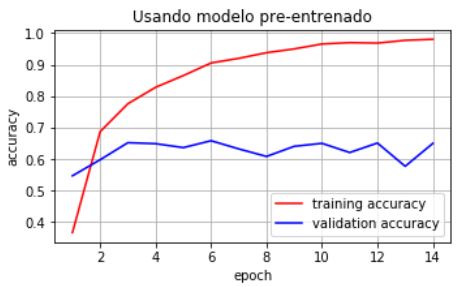

```
Exactitud en subconjunto de test:
Test loss: 1.7757024824619294
Test accuracy: 0.6708333333333333

Exactitud en todo el dataset:
Test loss: 1.7135199553734057
Test accuracy: 0.6618917441680954
============================================================
Experimento Xception 8b
experimento = Experimento Xception 8b
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = rmsprop
clasificador = XCEPTION-2
batch_size = 128
epochs = 8
run_experiment = True
------------------------------------------------------------
Número de clases: 102
Número de muestras: 100
Usando rmsprop
Train on 4478 samples, validate on 960 samples
Epoch 1/8
4478/4478 [==============================] - 28s 6ms/step - loss: 3.3548 - acc: 0.3687 - val_loss: 2.1738 - val_acc: 0.5500
Epoch 2/8
4478/4478 [==============================] - 6s 1ms/step - loss: 1.7662 - acc: 0.6867 - val_loss: 1.7029 - val_acc: 0.6292
Epoch 3/8
4478/4478 [==============================] - 6s 1ms/step - loss: 1.2316 - acc: 0.7747 - val_loss: 1.7862 - val_acc: 0.6417
Epoch 4/8
4478/4478 [==============================] - 6s 1ms/step - loss: 0.9047 - acc: 0.8289 - val_loss: 1.8978 - val_acc: 0.6365
Epoch 5/8
4478/4478 [==============================] - 6s 1ms/step - loss: 0.6792 - acc: 0.8723 - val_loss: 2.1732 - val_acc: 0.6417
Epoch 6/8
4478/4478 [==============================] - 6s 1ms/step - loss: 0.5660 - acc: 0.9062 - val_loss: 2.2028 - val_acc: 0.6406
Epoch 7/8
4478/4478 [==============================] - 6s 1ms/step - loss: 0.4391 - acc: 0.9218 - val_loss: 2.2767 - val_acc: 0.6448
Epoch 8/8
4478/4478 [==============================] - 6s 1ms/step - loss: 0.3740 - acc: 0.9366 - val_loss: 2.2589 - val_acc: 0.6615
```

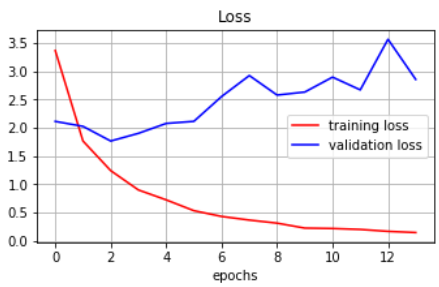






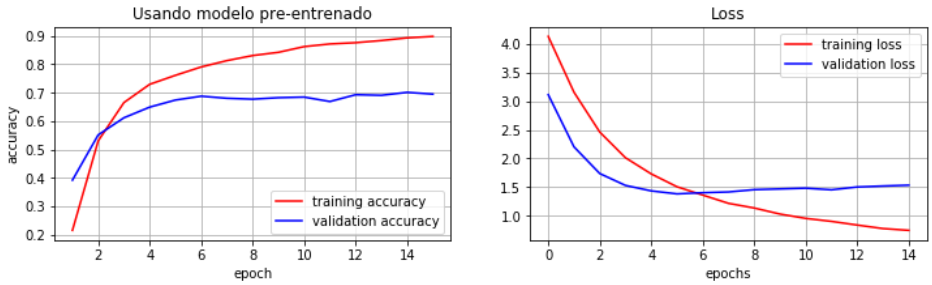

```
Exactitud en subconjunto de test:
Test loss: 1.9642682830492655
Test accuracy: 0.6833333333333333

Exactitud en todo el dataset:
Test loss: 2.0995704133486477
Test accuracy: 0.6587206124021031
============================================================
Experimento Xception 8c
experimento = Experimento Xception 8c
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = rmsprop
clasificador = XCEPTION-2
batch_size = 128
epochs = 14
run_experiment = True
------------------------------------------------------------
Número de clases: 102
Número de muestras: 100
Usando rmsprop
Train on 4478 samples, validate on 960 samples
Epoch 1/14
4478/4478 [==============================] - 29s 6ms/step - loss: 3.3641 - acc: 0.3667 - val_loss: 2.1102 - val_acc: 0.5469
Epoch 2/14
4478/4478 [==============================] - 6s 1ms/step - loss: 1.7627 - acc: 0.6874 - val_loss: 2.0223 - val_acc: 0.5979
Epoch 3/14
4478/4478 [==============================] - 6s 1ms/step - loss: 1.2384 - acc: 0.7758 - val_loss: 1.7624 - val_acc: 0.6521
Epoch 4/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.8963 - acc: 0.8280 - val_loss: 1.8988 - val_acc: 0.6490
Epoch 5/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.7210 - acc: 0.8653 - val_loss: 2.0739 - val_acc: 0.6365
Epoch 6/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.5293 - acc: 0.9053 - val_loss: 2.1111 - val_acc: 0.6583
Epoch 7/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.4273 - acc: 0.9201 - val_loss: 2.5510 - val_acc: 0.6323
Epoch 8/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.3631 - acc: 0.9379 - val_loss: 2.9216 - val_acc: 0.6083
Epoch 9/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.3090 - acc: 0.9500 - val_loss: 2.5759 - val_acc: 0.6406
Epoch 10/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.2210 - acc: 0.9656 - val_loss: 2.6297 - val_acc: 0.6500
Epoch 11/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.2144 - acc: 0.9699 - val_loss: 2.8936 - val_acc: 0.6208
Epoch 12/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.1973 - acc: 0.9685 - val_loss: 2.6678 - val_acc: 0.6510
Epoch 13/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.1636 - acc: 0.9772 - val_loss: 3.5637 - val_acc: 0.5771
Epoch 14/14
4478/4478 [==============================] - 6s 1ms/step - loss: 0.1426 - acc: 0.9806 - val_loss: 2.8530 - val_acc: 0.6500
```



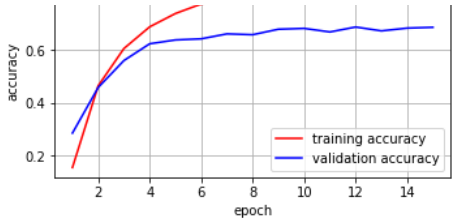


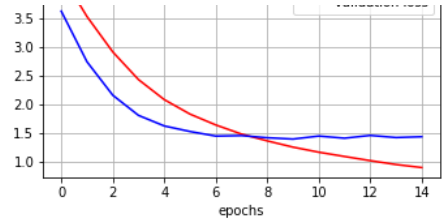

```
Exactitud en subconjunto de test:
Test loss: 2.6981287598609924
Test accuracy: 0.6625

Exactitud en todo el dataset:
Test loss: 2.6710389756445214
Test accuracy: 0.6506287589302605
============================================================
Experimento Xception 11a
experimento = Experimento Xception 11a
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = XCEPTION-3
batch_size = 64
epochs = 15
run_experiment = True
------------------------------------------------------------
Número de clases: 102
Número de muestras: 100
Usando Adam
Train on 4478 samples, validate on 960 samples
Epoch 1/15
4478/4478 [==============================] - 30s 7ms/step - loss: 4.1290 - acc: 0.2148 - val_loss: 3.1128 - val_acc: 0.3917
Epoch 2/15
4478/4478 [==============================] - 6s 1ms/step - loss: 3.1556 - acc: 0.5299 - val_loss: 2.2028 - val_acc: 0.5510
Epoch 3/15
```

```
Epoch 3/15
4478/4478 [==============================] - 6s 1ms/step - loss: 2.4613 - acc: 0.6650 - val_loss: 1.7379 - val_acc: 0.6115
Epoch 4/15
4478/4478 [==============================] - 6s 1ms/step - loss: 2.0129 - acc: 0.7293 - val_loss: 1.5304 - val_acc: 0.6490
Epoch 5/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.7313 - acc: 0.7611 - val_loss: 1.4351 - val_acc: 0.6740
Epoch 6/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.5071 - acc: 0.7905 - val_loss: 1.3834 - val_acc: 0.6875
Epoch 7/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.3623 - acc: 0.8129 - val_loss: 1.4034 - val_acc: 0.6802
Epoch 8/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.2181 - acc: 0.8307 - val_loss: 1.4167 - val_acc: 0.6771
Epoch 9/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.1367 - acc: 0.8421 - val_loss: 1.4567 - val_acc: 0.6823
Epoch 10/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.0312 - acc: 0.8622 - val_loss: 1.4696 - val_acc: 0.6844
Epoch 11/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.9554 - acc: 0.8716 - val_loss: 1.4825 - val_acc: 0.6687
Epoch 12/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.9037 - acc: 0.8761 - val_loss: 1.4544 - val_acc: 0.6927
Epoch 13/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.8393 - acc: 0.8837 - val_loss: 1.5031 - val_acc: 0.6906
Epoch 14/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.7782 - acc: 0.8930 - val_loss: 1.5204 - val_acc: 0.7010
Epoch 15/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.7474 - acc: 0.8982 - val_loss: 1.5348 - val_acc: 0.6948
```

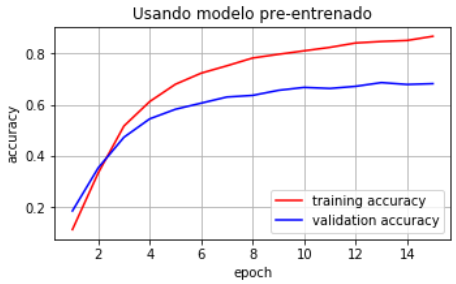


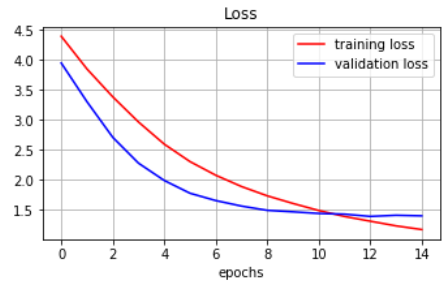

```
Exactitud en subconjunto de test:
Test loss: 1.343412317832311
Test accuracy: 0.7083333333333334

Exactitud en todo el dataset:
Test loss: 1.4526035645165256
Test accuracy: 0.6990705303900746
============================================================
Experimento Xception 11b
experimento = Experimento Xception 11b
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = XCEPTION-3
batch_size = 128
epochs = 15
run_experiment = True
------------------------------------------------------------
Número de clases: 102
Número de muestras: 100
Usando Adam
Train on 4478 samples, validate on 960 samples
Epoch 1/15
4478/4478 [==============================] - 31s 7ms/step - loss: 4.2717 - acc: 0.1539 - val_loss: 3.6258 - val_acc: 0.2844
Epoch 2/15
4478/4478 [==============================] - 6s 1ms/step - loss: 3.5313 - acc: 0.4636 - val_loss: 2.7398 - val_acc: 0.4573
Epoch 3/15
4478/4478 [==============================] - 6s 1ms/step - loss: 2.9137 - acc: 0.6050 - val_loss: 2.1559 - val_acc: 0.5594
Epoch 4/15
4478/4478 [==============================] - 6s 1ms/step - loss: 2.4286 - acc: 0.6871 - val_loss: 1.8024 - val_acc: 0.6229
Epoch 5/15
4478/4478 [==============================] - 6s 1ms/step - loss: 2.0786 - acc: 0.7376 - val_loss: 1.6176 - val_acc: 0.6375
Epoch 6/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.8249 - acc: 0.7738 - val_loss: 1.5205 - val_acc: 0.6417
Epoch 7/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.6352 - acc: 0.8046 - val_loss: 1.4403 - val_acc: 0.6604
Epoch 8/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.4753 - acc: 0.8184 - val_loss: 1.4488 - val_acc: 0.6573
Epoch 9/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.3562 - acc: 0.8330 - val_loss: 1.4113 - val_acc: 0.6781
Epoch 10/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.2469 - acc: 0.8466 - val_loss: 1.3880 - val_acc: 0.6813
Epoch 11/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.1582 - acc: 0.8566 - val_loss: 1.4409 - val_acc: 0.6677
Epoch 12/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.0833 - acc: 0.8714 - val_loss: 1.4033 - val_acc: 0.6865
Epoch 13/15
4478/4478 [==============================] - 6s 1ms/step - loss: 1.0102 - acc: 0.8752 - val_loss: 1.4519 - val_acc: 0.6719
Epoch 14/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.9423 - acc: 0.8848 - val_loss: 1.4148 - val_acc: 0.6823
Epoch 15/15
4478/4478 [==============================] - 6s 1ms/step - loss: 0.8896 - acc: 0.8863 - val_loss: 1.4292 - val_acc: 0.6854
```






```
Exactitud en subconjunto de test:
Test loss: 1.2504120290279388
Test accuracy: 0.7083333333333334

Exactitud en todo el dataset:
Test loss: 1.3045565273340063
Test accuracy: 0.7053034445508182
============================================================
Experimento Xception11c
experimento = Experimento Xception11c
model = <keras.engine.training.Model object at 0x7fa1dce3ee48>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = XCEPTION-3
batch_size = 256
epochs = 15
run_experiment = True
------------------------------------------------------------
Número de clases: 102
Número de muestras: 100
Usando Adam
Train on 4478 samples, validate on 960 samples
Epoch 1/15
4478/4478 [==============================] - 32s 7ms/step - loss: 4.3932 - acc: 0.1126 - val_loss: 3.9473 - val_acc: 0.1854
Epoch 2/15
4478/4478 [==============================] - 5s 1ms/step - loss: 3.8477 - acc: 0.3332 - val_loss: 3.3016 - val_acc: 0.3531
Epoch 3/15
4478/4478 [==============================] - 5s 1ms/step - loss: 3.3838 - acc: 0.5167 - val_loss: 2.7090 - val_acc: 0.4729
Epoch 4/15
4478/4478 [==============================] - 5s 1ms/step - loss: 2.9645 - acc: 0.6123 - val_loss: 2.2783 - val_acc: 0.5448
Epoch 5/15
4478/4478 [==============================] - 5s 1ms/step - loss: 2.5952 - acc: 0.6800 - val_loss: 1.9898 - val_acc: 0.5823
Epoch 6/15
4478/4478 [==============================] - 5s 1ms/step - loss: 2.3045 - acc: 0.7233 - val_loss: 1.7769 - val_acc: 0.6063
Epoch 7/15
4478/4478 [==============================] - 5s 1ms/step - loss: 2.0772 - acc: 0.7521 - val_loss: 1.6549 - val_acc: 0.6302
Epoch 8/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.8889 - acc: 0.7825 - val_loss: 1.5629 - val_acc: 0.6365
Epoch 9/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.7337 - acc: 0.7970 - val_loss: 1.4921 - val_acc: 0.6562
Epoch 10/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.6066 - acc: 0.8106 - val_loss: 1.4669 - val_acc: 0.6677
Epoch 11/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.4892 - acc: 0.8240 - val_loss: 1.4400 - val_acc: 0.6635
Epoch 12/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.3899 - acc: 0.8412 - val_loss: 1.4284 - val_acc: 0.6719
Epoch 13/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.3112 - acc: 0.8470 - val_loss: 1.3908 - val_acc: 0.6865
Epoch 14/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.2333 - acc: 0.8510 - val_loss: 1.4098 - val_acc: 0.6792
Epoch 15/15
4478/4478 [==============================] - 5s 1ms/step - loss: 1.1719 - acc: 0.8674 - val_loss: 1.4004 - val_acc: 0.6823
```






```
Exactitud en subconjunto de test:
Test loss: 1.2259459952513376
Test accuracy: 0.709375

Exactitud en todo el dataset:
Test loss: 1.2848473949085957
Test accuracy: 0.7093493712867395
```

Resultados XCEPTION