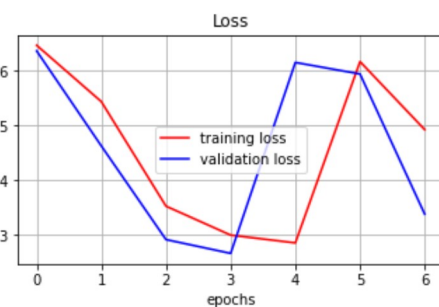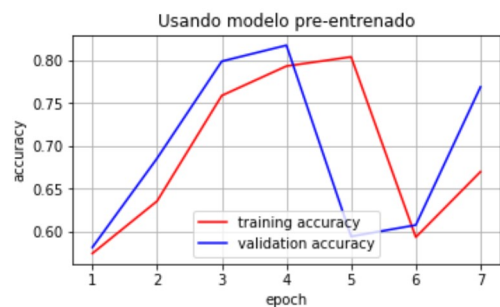```
Modelo base: vgg16_base
<tensorflow.python.keras.engine.training.Model object at 0x7f570c7f8a58>
Adam
Epoch 1/10
218/218 [==============================] - 20s 91ms/step - loss: 6.4597 - accuracy: 0.5743 - val_loss: 6.3572 - val_accuracy: 0.5813
Epoch 2/10
218/218 [==============================] - 20s 90ms/step - loss: 5.4308 - accuracy: 0.6353 - val_loss: 4.6206 - val_accuracy: 0.6853
Epoch 3/10
218/218 [==============================] - 20s 90ms/step - loss: 3.5200 - accuracy: 0.7586 - val_loss: 2.9094 - val_accuracy: 0.7987
Epoch 4/10
218/218 [==============================] - 20s 90ms/step - loss: 2.9912 - accuracy: 0.7931 - val_loss: 2.6574 - val_accuracy: 0.8173
Epoch 5/10
218/218 [==============================] - 20s 90ms/step - loss: 2.8486 - accuracy: 0.8038 - val_loss: 6.1464 - val_accuracy: 0.5940
Epoch 6/10
218/218 [==============================] - 20s 90ms/step - loss: 6.1619 - accuracy: 0.5931 - val_loss: 5.9352 - val_accuracy: 0.6073
Epoch 7/10
218/218 [==============================] - ETA: 0s - loss: 4.9190 - accuracy: 0.6696Restoring model weights from the end of the best epoch.
218/218 [==============================] - 20s 90ms/step - loss: 4.9190 - accuracy: 0.6696 - val_loss: 3.3750 - val_accuracy: 0.7687
Epoch 00007: early stopping
```
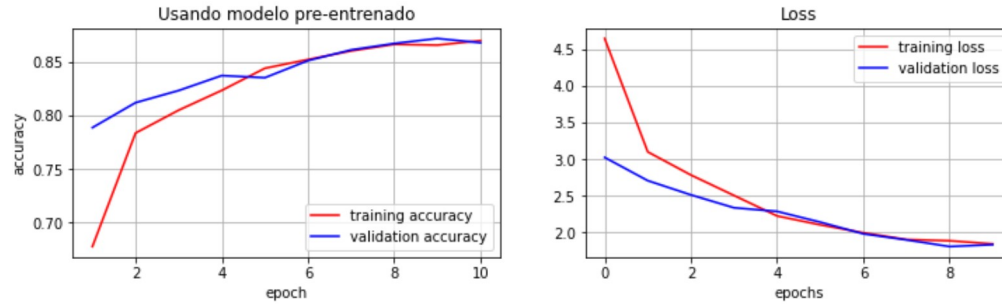


```
10/10 [==============================] - 3s 311ms/step - loss: 2.4606 - accuracy: 0.8273
--------------------------------------------------------------------------------------
<tensorflow.python.keras.engine.training.Model object at 0x7f570c7f8a58>
Epoch 1/10
218/218 [==============================] - 20s 91ms/step - loss: 4.6417 - accuracy: 0.6775 - val_loss: 3.0232 - val_accuracy: 0.7887
Epoch 2/10
218/218 [==============================] - 20s 90ms/step - loss: 3.0986 - accuracy: 0.7836 - val_loss: 2.7069 - val_accuracy: 0.8120
Epoch 3/10
218/218 [==============================] - 20s 90ms/step - loss: 2.7837 - accuracy: 0.8050 - val_loss: 2.5134 - val_accuracy: 0.8233
Epoch 4/10
218/218 [==============================] - 20s 90ms/step - loss: 2.5051 - accuracy: 0.8235 - val_loss: 2.3378 - val_accuracy: 0.8373
Epoch 5/10
218/218 [==============================] - 20s 90ms/step - loss: 2.2261 - accuracy: 0.8441 - val_loss: 2.2883 - val_accuracy: 0.8353
Epoch 6/10
218/218 [==============================] - 20s 90ms/step - loss: 2.1055 - accuracy: 0.8523 - val_loss: 2.1422 - val_accuracy: 0.8513
Epoch 7/10
218/218 [==============================] - 20s 90ms/step - loss: 1.9976 - accuracy: 0.8604 - val_loss: 1.9828 - val_accuracy: 0.8613
Epoch 8/10
218/218 [==============================] - 20s 90ms/step - loss: 1.9056 - accuracy: 0.8665 - val_loss: 1.9007 - val_accuracy: 0.8673
Epoch 9/10
218/218 [==============================] - 20s 90ms/step - loss: 1.8886 - accuracy: 0.8658 - val_loss: 1.8099 - val_accuracy: 0.8720
```

```
Epoch 10/10
218/218 [==============================] - 20s 90ms/step - loss: 1.8457 - accuracy: 0.8700 - val_loss: 1.8362 - val_accuracy: 0.8680
```



```
10/10 [==============================] - 3s 311ms/step - loss: 1.6867 - accuracy: 0.8820
--------------------------------------------------------------------------------------------
<tensorflow.python.keras.engine.training.Model object at 0x7f570c7f8a58>
SGD
Epoch 1/10
218/218 [==============================] - 20s 91ms/step - loss: 6.5068 - accuracy: 0.5731 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 2/10
218/218 [==============================] - 20s 90ms/step - loss: 6.4757 - accuracy: 0.5753 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 3/10
218/218 [==============================] - 20s 90ms/step - loss: 6.5019 - accuracy: 0.5736 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 4/10
218/218 [==============================] - ETA: 0s - loss: 6.4954 - accuracy: 0.5741Restoring model weights from the end of the best epoch.
218/218 [==============================] - 20s 90ms/step - loss: 6.4954 - accuracy: 0.5741 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 00004: early stopping
```
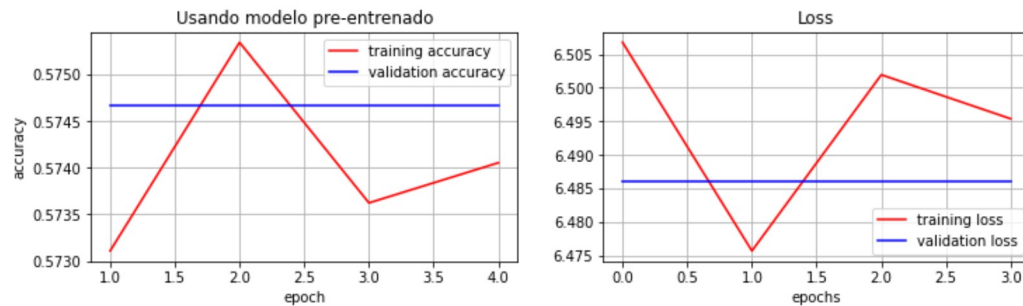


```
10/10 [==============================] - 3s 311ms/step - loss: 6.4962 - accuracy: 0.5740
--------------------------------------------------------------------------------------------
Modelo base: resnet50_base
<tensorflow.python.keras.engine.training.Model object at 0x7f56eaf1eeb8>
Adam
Epoch 1/10
218/218 [==============================] - 14s 66ms/step - loss: 8.8634 - accuracy: 0.4250 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 2/10
218/218 [==============================] - 13s 62ms/step - loss: 8.8614 - accuracy: 0.4255 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 3/10
218/218 [==============================] - 13s 62ms/step - loss: 8.8459 - accuracy: 0.4265 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 4/10
218/218 [==============================] - ETA: 0s - loss: 8.8879 - accuracy: 0.4238Restoring model weights from the end of the best epoch.
```
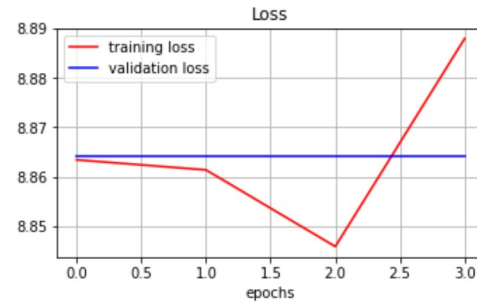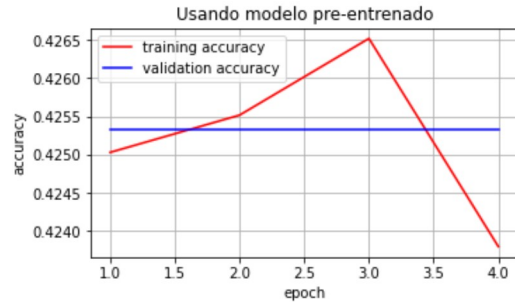
```
218/218 [==============================] - 14s 62ms/step - loss: 8.8879 - accuracy: 0.4238 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 00004: early stopping
```



```
10/10 [==============================] - 2s 192ms/step - loss: 8.8539 - accuracy: 0.4260
-------------------------------------------------------------------------------------------
<tensorflow.python.keras.engine.training.Model object at 0x7f56eaf1eeb8>
Epoch 1/10
218/218 [==============================] - 14s 66ms/step - loss: 2.5154 - accuracy: 0.7833 - val_loss: 1.5761 - val_accuracy: 0.8440
Epoch 2/10
218/218 [==============================] - 14s 63ms/step - loss: 1.5309 - accuracy: 0.8625 - val_loss: 1.2989 - val_accuracy: 0.8887
Epoch 3/10
218/218 [==============================] - 13s 62ms/step - loss: 1.4508 - accuracy: 0.8737 - val_loss: 2.1693 - val_accuracy: 0.8200
Epoch 4/10
218/218 [==============================] - 14s 63ms/step - loss: 1.3368 - accuracy: 0.8861 - val_loss: 1.2306 - val_accuracy: 0.8960
Epoch 5/10
218/218 [==============================] - 14s 63ms/step - loss: 1.2579 - accuracy: 0.8928 - val_loss: 1.2250 - val_accuracy: 0.8927
Epoch 6/10
218/218 [==============================] - 13s 62ms/step - loss: 1.5758 - accuracy: 0.8716 - val_loss: 1.3310 - val_accuracy: 0.8840
Epoch 7/10
218/218 [==============================] - 14s 62ms/step - loss: 1.2167 - accuracy: 0.8975 - val_loss: 1.0908 - val_accuracy: 0.9020
Epoch 8/10
218/218 [==============================] - 13s 62ms/step - loss: 1.1500 - accuracy: 0.9027 - val_loss: 2.0656 - val_accuracy: 0.8333
Epoch 9/10
218/218 [==============================] - 14s 62ms/step - loss: 1.1633 - accuracy: 0.9079 - val_loss: 1.2081 - val_accuracy: 0.8993
Epoch 10/10
218/218 [==============================] - ETA: 0s - loss: 1.1868 - accuracy: 0.9047Restoring model weights from the end of the best epoch.
218/218 [==============================] - 14s 62ms/step - loss: 1.1868 - accuracy: 0.9047 - val_loss: 1.2754 - val_accuracy: 0.8960
Epoch 00010: early stopping
```
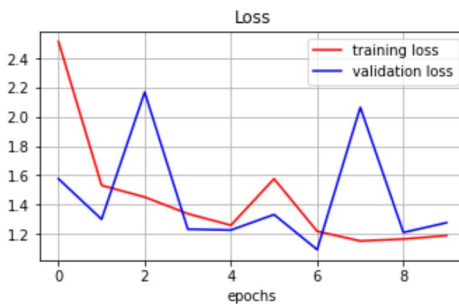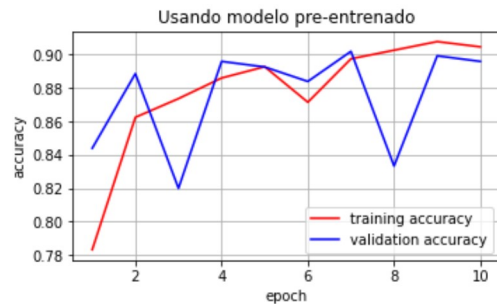


```
10/10 [==============================] - 2s 191ms/step - loss: 1.0977 - accuracy: 0.9087
-------------------------------------------------------------------------------------------
```

```
<tensorflow.python.keras.engine.training.Model object at 0x7f56eaf1eeb8>
SGD
Epoch 1/10
218/218 [==============================] - 14s 66ms/step - loss: 6.4616 - accuracy: 0.5747 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 2/10
218/218 [==============================] - 13s 62ms/step - loss: 6.4888 - accuracy: 0.5745 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 3/10
218/218 [==============================] - 13s 62ms/step - loss: 6.4779 - accuracy: 0.5752 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 4/10
218/218 [==============================] - ETA: 0s - loss: 6.5129 - accuracy: 0.5729Restoring model weights from the end of the best epoch.
218/218 [==============================] - 14s 62ms/step - loss: 6.5129 - accuracy: 0.5729 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 00004: early stopping
```
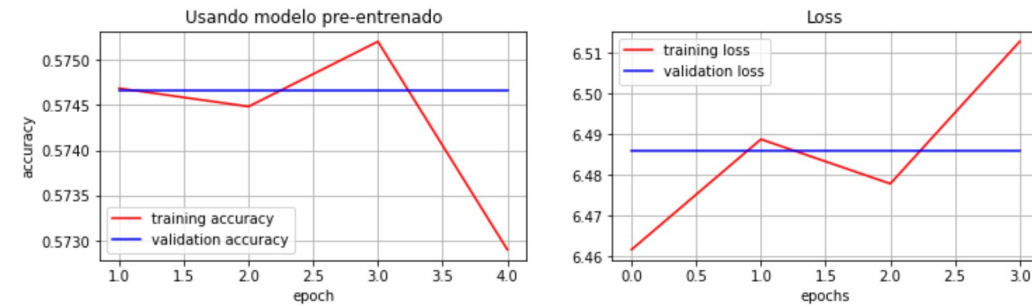


```
10/10 [==============================] - 2s 192ms/step - loss: 6.4962 - accuracy: 0.5740
-----------------------------------------------------------------------------------------
Modelo base: MobileNetV2_base
<tensorflow.python.keras.engine.training.Model object at 0x7f57766f5dd8>
Adam
Epoch 1/10
218/218 [==============================] - 7s 32ms/step - loss: 6.4925 - accuracy: 0.5741 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 2/10
218/218 [==============================] - 6s 29ms/step - loss: 6.4779 - accuracy: 0.5752 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 3/10
218/218 [==============================] - 6s 29ms/step - loss: 6.4735 - accuracy: 0.5755 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 4/10
217/218 [============================>.] - ETA: 0s - loss: 6.5253 - accuracy: 0.5721Restoring model weights from the end of the best epoch.
218/218 [==============================] - 6s 29ms/step - loss: 6.5085 - accuracy: 0.5732 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 00004: early stopping
```
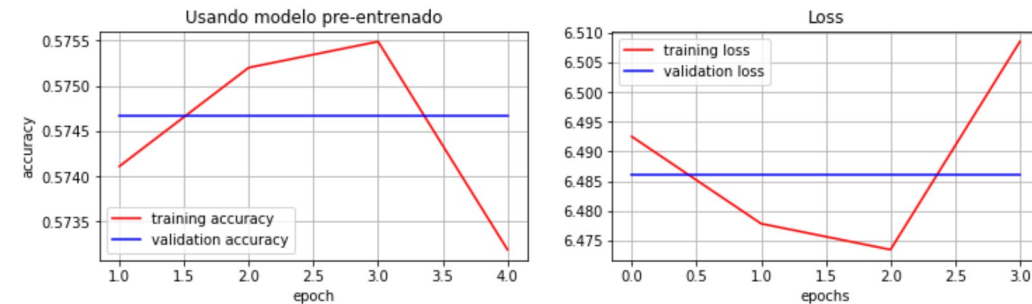


```
10/10 [==============================] - 1s 87ms/step - loss: 6.4962 - accuracy: 0.5740
-----------------------------------------------------------------------------------------
```

```
<tensorflow.python.keras.engine.training.Model object at 0x7f57766f5dd8>
Epoch 1/10
218/218 [==============================] - 7s 32ms/step - loss: 8.8605 - accuracy: 0.4255 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 2/10
218/218 [==============================] - 6s 29ms/step - loss: 8.8658 - accuracy: 0.4252 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 3/10
218/218 [==============================] - 6s 29ms/step - loss: 8.8592 - accuracy: 0.4257 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 4/10
217/218 [=============================>.] - ETA: 0s - loss: 8.8845 - accuracy: 0.4240Restoring model weights from the end of the best epoch.
218/218 [==============================] - 6s 29ms/step - loss: 8.8769 - accuracy: 0.4245 - val_loss: 8.8642 - val_accuracy: 0.4253
Epoch 00004: early stopping
```
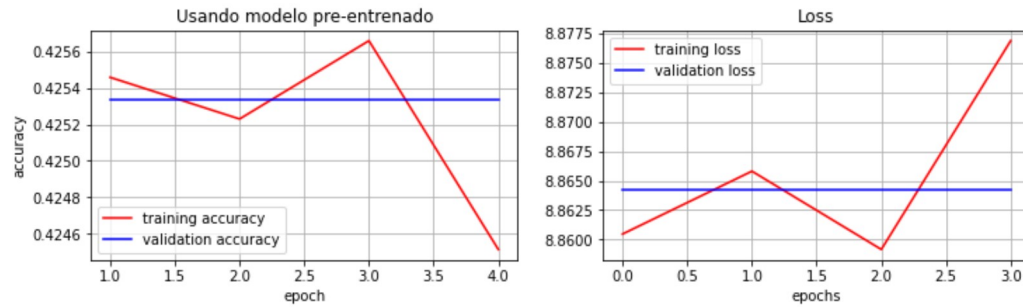


```
10/10 [==============================] - 1s 87ms/step - loss: 8.8539 - accuracy: 0.4260
--------------------------------------------------------------------------------------
<tensorflow.python.keras.engine.training.Model object at 0x7f57766f5dd8>
SGD
Epoch 1/10
218/218 [==============================] - 7s 32ms/step - loss: 6.4859 - accuracy: 0.5738 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 2/10
218/218 [==============================] - 6s 29ms/step - loss: 6.4866 - accuracy: 0.5746 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 3/10
218/218 [==============================] - 6s 29ms/step - loss: 6.4954 - accuracy: 0.5741 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 4/10
217/218 [=============================>.] - ETA: 0s - loss: 6.4616 - accuracy: 0.5763Restoring model weights from the end of the best epoch.
218/218 [==============================] - 6s 29ms/step - loss: 6.4713 - accuracy: 0.5756 - val_loss: 6.4860 - val_accuracy: 0.5747
Epoch 00004: early stopping
```
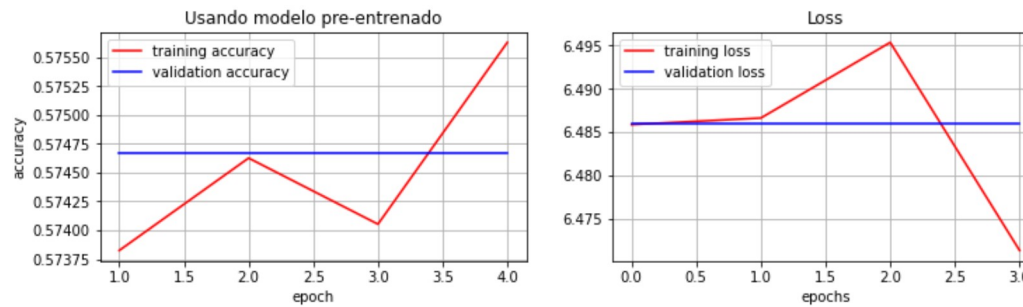


```
10/10 [==============================] - 1s 88ms/step - loss: 6.4962 - accuracy: 0.5740
--------------------------------------------------------------------------------------
```