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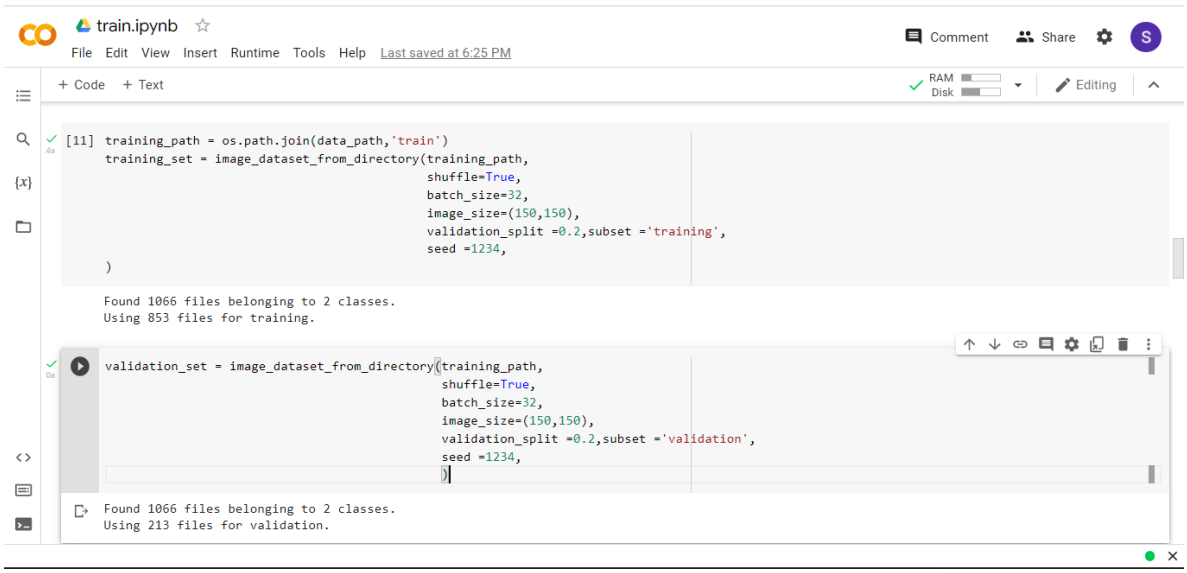
Proyecto integrador: Machine Learning.

1. GitHub: https://github.com/SaraCastril1/PI_MLProject.git

2. Nuevo modelo → EfficientNet B1 →NOTA: Los cambios del nuevo modelo se encuentran en la rama EfficientNetB1_model del repositorio de GitHub



```
[13] training_set.class_names
```

```
['cat', 'dog']
```

```
class_names = training_set.class_names
plt.figure(figsize=(10,10))
for images, labels in training_set.take(1):
  for i in range(9):
    ax = plt.subplot(3,3, i +1)
    plt.imshow(images[i].numpy().astype("uint8"))
    plt.title(class_names[labels[i]])
    plt.axis("off")
```


```
[15] base_model = keras.applications.EfficientNetB1(
        weights ='imagenet',
        input_shape = (150,150,3),
        include_top =False,
        )
     base_model.trainable =False
```

```
Downloading data from https://storage.googleapis.com/keras-applications/efficientnetb1_notop.h5
27025408/27018416 [==============================] - 0s 0us/step
27033600/27018416 [==============================] - 0s 0us/step
```

```
inputs = keras.Input(shape = (150,150,3))
x = tf.keras.applications.efficientnet.preprocess_input(inputs)
x = base_model(x, training=False)
x = keras.layers.GlobalAveragePooling2D()(x)
x = keras.layers.Dropout(0.2)(x)
outputs = keras.layers.Dense(1)(x)
model = keras.Model(inputs,outputs)
```

```
[17] model.compile(optimizer='adam', loss =
                   tf.keras.losses.BinaryCrossentropy(from_logits = True), metrics =
                   keras.metrics.BinaryAccuracy())
     model.fit(training_set, epochs =20, validation_data= validation_set)
```

```
Epoch 1/20
27/27 [==============================] - 48s 1s/step - loss: 0.3371 - binary_accuracy: 0.9191 - val_loss: 0.1592 - val_binary_accuracy: 0.9155
Epoch 2/20
27/27 [==============================] - 3s 94ms/step - loss: 0.0998 - binary_accuracy: 0.9496 - val_loss: 0.1143 - val_binary_accuracy: 0.9296
Epoch 3/20
27/27 [==============================] - 3s 97ms/step - loss: 0.0696 - binary_accuracy: 0.9637 - val_loss: 0.0895 - val_binary_accuracy: 0.9390
Epoch 4/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0527 - binary_accuracy: 0.9766 - val_loss: 0.0747 - val_binary_accuracy: 0.9484
Epoch 5/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0455 - binary_accuracy: 0.9812 - val_loss: 0.0664 - val_binary_accuracy: 0.9531
Epoch 6/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0381 - binary_accuracy: 0.9848 - val_loss: 0.0616 - val_binary_accuracy: 0.9531
Epoch 7/20
27/27 [==============================] - 4s 118ms/step - loss: 0.0325 - binary_accuracy: 0.9871 - val_loss: 0.0563 - val_binary_accuracy: 0.9531
Epoch 8/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0286 - binary_accuracy: 0.9883 - val_loss: 0.0538 - val_binary_accuracy: 0.9531
```

```
Epoch 6/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0381 - binary_accuracy: 0.9848 - val_loss: 0.0616 - val_binary_accuracy: 0.9531
Epoch 7/20
27/27 [==============================] - 4s 118ms/step - loss: 0.0325 - binary_accuracy: 0.9871 - val_loss: 0.0563 - val_binary_accuracy: 0.9531
Epoch 8/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0286 - binary_accuracy: 0.9883 - val_loss: 0.0538 - val_binary_accuracy: 0.9531
Epoch 9/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0236 - binary_accuracy: 0.9918 - val_loss: 0.0521 - val_binary_accuracy: 0.9531
Epoch 10/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0231 - binary_accuracy: 0.9930 - val_loss: 0.0491 - val_binary_accuracy: 0.9577
Epoch 11/20
27/27 [==============================] - 3s 96ms/step - loss: 0.0183 - binary_accuracy: 0.9965 - val_loss: 0.0479 - val_binary_accuracy: 0.9577
Epoch 12/20
27/27 [==============================] - 3s 95ms/step - loss: 0.0180 - binary_accuracy: 0.9953 - val_loss: 0.0464 - val_binary_accuracy: 0.9577
Epoch 13/20
27/27 [==============================] - 3s 97ms/step - loss: 0.0165 - binary_accuracy: 0.9965 - val_loss: 0.0452 - val_binary_accuracy: 0.9577
Epoch 14/20
27/27 [==============================] - 3s 98ms/step - loss: 0.0139 - binary_accuracy: 0.9977 - val_loss: 0.0451 - val_binary_accuracy: 0.9577
Epoch 15/20
27/27 [==============================] - 3s 95ms/step - loss: 0.0131 - binary_accuracy: 0.9988 - val_loss: 0.0442 - val_binary_accuracy: 0.9577
Epoch 16/20
27/27 [==============================] - 3s 95ms/step - loss: 0.0122 - binary_accuracy: 0.9988 - val_loss: 0.0436 - val_binary_accuracy: 0.9577
Epoch 17/20
27/27 [==============================] - 3s 94ms/step - loss: 0.0113 - binary_accuracy: 0.9988 - val_loss: 0.0422 - val_binary_accuracy: 0.9577
Epoch 18/20
27/27 [==============================] - 3s 95ms/step - loss: 0.0113 - binary_accuracy: 0.9977 - val_loss: 0.0409 - val_binary_accuracy: 0.9577
Epoch 19/20
```

```python
json_config = model.to_json()
with open('model_config_EfficientNetB1.json','w') as json_file:
  json_file.write(json_config)

model.save_weights('pets_EfficientNetB1_transferlearning.h5')
```

3. App: