```
 1 D:\OneDrive\TFG\TFG_Python\venv\Scripts\python.exe C:\
   Users\elias\AppData\Local\JetBrains\Toolbox\apps\PyCharm-P
   \ch-0\183.4284.139\helpers\pydev\pydevconsole.py --mode=
   client --port=50271
 2
 3 import sys; print('Python %s on %s' % (sys.version, sys.
   platform))
 4 sys.path.extend(['D:\\OneDrive\\TFG\\TFG_Python', 'D:/
   OneDrive/TFG/TFG_Python'])
 5
 6 PyDev console: starting.
 7
 8 Python 3.6.7 (v3.6.7:6ec5cf24b7, Oct 20 2018, 13:35:33) [
   MSC v.1900 64 bit (AMD64)] on win32
 9 >>> runfile('D:/OneDrive/TFG/TFG_Python/core/model.py',
   wdir='D:/OneDrive/TFG/TFG_Python/core')
10 Using TensorFlow backend.
11 ISBINARY: True
12 tipo
13 benign          2510
14 malignant       2510
15 premalignant    2510
16 dtype: int64
17 Valid gen: Img leidas= 0
18 Valid gen: Img leidas= 100
19 Valid gen: Img leidas= 200
20 Valid gen: Img leidas= 300
21 Valid gen: Img leidas= 400
22 Valid gen: Img leidas= 500
23 Valid gen: Img leidas= 600
24 Valid gen: Img leidas= 700
25 Valid gen: Img leidas= 800
26 Valid gen: Img leidas= 900
27 Valid gen: Img leidas= 1000
28 Valid gen: Img leidas= 1100
29 Valid gen: Img leidas= 1200
30 Creando modelo y compilandolo
31 2019-04-27 10:12:12.664536: I tensorflow/core/platform/
   cpu_feature_guard.cc:141] Your CPU supports instructions
   that this TensorFlow binary was not compiled to use: AVX2
32 2019-04-27 10:12:12.946757: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1432] Found device 0 with
    properties:
33 name: GeForce GTX 1070 major: 6 minor: 1 memoryClockRate(
   GHz): 1.835
```

```
34 pciBusID: 0000:26:00.0
35 totalMemory: 8.00GiB freeMemory: 6.64GiB
36 2019-04-27 10:12:12.960448: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1511] Adding visible gpu
   devices: 0
37 2019-04-27 10:12:16.523423: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:982] Device interconnect
   StreamExecutor with strength 1 edge matrix:
38 2019-04-27 10:12:16.523531: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:988]       0
39 2019-04-27 10:12:16.523590: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1001] 0:   N
40 2019-04-27 10:12:16.571199: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1115] Created TensorFlow
   device (/job:localhost/replica:0/task:0/device:GPU:0 with
   6397 MB memory) -> physical GPU (device: 0, name: GeForce
   GTX 1070, pci bus id: 0000:26:00.0, compute capability: 6.
   1)
41 Se comienza el entrenamiento del modelo
42 ['loss', 'acc']
43 Epoch 1/40
44 2019-04-27 10:13:46.814359: W tensorflow/core/
   common_runtime/bfc_allocator.cc:211] Allocator (GPU_0_bfc
   ) ran out of memory trying to allocate 2.03GiB. The caller
    indicates that this is not a failure, but may mean that
   there could be performance gains if more memory were
   available.
45 2019-04-27 10:13:46.984671: W tensorflow/core/
   common_runtime/bfc_allocator.cc:211] Allocator (GPU_0_bfc
   ) ran out of memory trying to allocate 2.00GiB. The caller
    indicates that this is not a failure, but may mean that
   there could be performance gains if more memory were
   available.
46 2019-04-27 10:13:46.987968: W tensorflow/core/
   common_runtime/bfc_allocator.cc:211] Allocator (GPU_0_bfc
   ) ran out of memory trying to allocate 2.15GiB. The caller
    indicates that this is not a failure, but may mean that
   there could be performance gains if more memory were
   available.
47  - 112s - loss: 0.1667 - acc: 0.6510 - val_loss: 0.1669 -
   val_acc: 0.6896
48 Epoch 2/40
49  - 69s - loss: 0.1022 - acc: 0.7906 - val_loss: 0.1254 -
   val_acc: 0.7577
50 Epoch 3/40
```

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51   - 71s - loss: 0.0892 - acc: 0.8250 - val_loss: 0.1185 -
     val_acc: 0.7685
52 Epoch 4/40
53   - 64s - loss: 0.0864 - acc: 0.8156 - val_loss: 0.1350 -
     val_acc: 0.7444
54 Epoch 5/40
55   - 65s - loss: 0.0975 - acc: 0.7885 - val_loss: 0.1271 -
     val_acc: 0.7651
56 Epoch 6/40
57   - 68s - loss: 0.0864 - acc: 0.8208 - val_loss: 0.0972 -
     val_acc: 0.7925
58 Epoch 7/40
59   - 63s - loss: 0.0743 - acc: 0.8448 - val_loss: 0.1017 -
     val_acc: 0.8050
60 Epoch 8/40
61   - 62s - loss: 0.0763 - acc: 0.8438 - val_loss: 0.0887 -
     val_acc: 0.8174
62 Epoch 9/40
63   - 71s - loss: 0.0625 - acc: 0.8708 - val_loss: 0.0859 -
     val_acc: 0.8158
64 Epoch 10/40
65   - 60s - loss: 0.0686 - acc: 0.8583 - val_loss: 0.0771 -
     val_acc: 0.8373
66 Epoch 11/40
67   - 82s - loss: 0.0690 - acc: 0.8583 - val_loss: 0.0938 -
     val_acc: 0.7959
68 Epoch 12/40
69   - 80s - loss: 0.0665 - acc: 0.8583 - val_loss: 0.1086 -
     val_acc: 0.7668
70 Epoch 13/40
71   - 60s - loss: 0.0535 - acc: 0.9031 - val_loss: 0.0775 -
     val_acc: 0.8373
72 Epoch 14/40
73   - 61s - loss: 0.0524 - acc: 0.8958 - val_loss: 0.0785 -
     val_acc: 0.8415
74 Epoch 15/40
75   - 59s - loss: 0.0560 - acc: 0.8938 - val_loss: 0.0860 -
     val_acc: 0.8083
76
77 Epoch 00015: ReduceLROnPlateau reducing learning rate to 0
     .00020000000949949026.
78 Epoch 16/40
79   - 65s - loss: 0.0540 - acc: 0.8875 - val_loss: 0.0755 -
     val_acc: 0.8290
80 Epoch 17/40
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 81   - 60s - loss: 0.0465 - acc: 0.9073 - val_loss: 0.0749 -
      val_acc: 0.8357
 82 Epoch 18/40
 83   - 65s - loss: 0.0506 - acc: 0.8979 - val_loss: 0.0715 -
      val_acc: 0.8515
 84 Epoch 19/40
 85   - 98s - loss: 0.0366 - acc: 0.9281 - val_loss: 0.0692 -
      val_acc: 0.8523
 86 Epoch 20/40
 87   - 61s - loss: 0.0369 - acc: 0.9260 - val_loss: 0.0666 -
      val_acc: 0.8556
 88 Epoch 21/40
 89   - 56s - loss: 0.0350 - acc: 0.9312 - val_loss: 0.0668 -
      val_acc: 0.8564
 90 Epoch 22/40
 91   - 59s - loss: 0.0303 - acc: 0.9448 - val_loss: 0.0670 -
      val_acc: 0.8531
 92 Epoch 23/40
 93   - 58s - loss: 0.0339 - acc: 0.9292 - val_loss: 0.0657 -
      val_acc: 0.8606
 94 Epoch 24/40
 95   - 52s - loss: 0.0278 - acc: 0.9438 - val_loss: 0.0652 -
      val_acc: 0.8647
 96 Epoch 25/40
 97   - 69s - loss: 0.0267 - acc: 0.9479 - val_loss: 0.0663 -
      val_acc: 0.8614
 98 Epoch 26/40
 99   - 54s - loss: 0.0287 - acc: 0.9427 - val_loss: 0.0647 -
      val_acc: 0.8680
100 Epoch 27/40
101   - 54s - loss: 0.0276 - acc: 0.9479 - val_loss: 0.0644 -
      val_acc: 0.8672
102 Epoch 28/40
103   - 58s - loss: 0.0219 - acc: 0.9583 - val_loss: 0.0648 -
      val_acc: 0.8689
104 Epoch 29/40
105   - 60s - loss: 0.0165 - acc: 0.9729 - val_loss: 0.0650 -
      val_acc: 0.8772
106 Epoch 30/40
107   - 59s - loss: 0.0314 - acc: 0.9458 - val_loss: 0.0644 -
      val_acc: 0.8755
108 Epoch 31/40
109   - 49s - loss: 0.0197 - acc: 0.9615 - val_loss: 0.0649 -
      val_acc: 0.8697
110 Epoch 32/40
```

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111   - 59s - loss: 0.0239 - acc: 0.9563 - val_loss: 0.0647 -
      val_acc: 0.8722
112
113  Epoch 00032: ReduceLROnPlateau reducing learning rate to
      2.0000000949949027e-05.
114  Epoch 33/40
115   - 57s - loss: 0.0200 - acc: 0.9635 - val_loss: 0.0651 -
      val_acc: 0.8697
116  Epoch 34/40
117   - 44s - loss: 0.0163 - acc: 0.9698 - val_loss: 0.0653 -
      val_acc: 0.8689
118  Epoch 35/40
119   - 60s - loss: 0.0147 - acc: 0.9719 - val_loss: 0.0653 -
      val_acc: 0.8680
120  Epoch 36/40
121   - 53s - loss: 0.0152 - acc: 0.9740 - val_loss: 0.0652 -
      val_acc: 0.8672
122  Epoch 37/40
123   - 114s - loss: 0.0192 - acc: 0.9677 - val_loss: 0.0658
       - val_acc: 0.8697
124
125  Epoch 00037: ReduceLROnPlateau reducing learning rate to
      2.0000001313746906e-06.
126  Entrenamiento completado, se procede al test final
127
128    32/1506 [..............................] - ETA: 10s
129    64/1506 [>.............................] - ETA: 9s
130    96/1506 [>.............................] - ETA: 9s
131   128/1506 [=>............................] - ETA: 9s
132   160/1506 [==>...........................] - ETA: 8s
133   192/1506 [==>...........................] - ETA: 8s
134   224/1506 [===>..........................] - ETA: 8s
135   256/1506 [====>.........................] - ETA: 8s
136   288/1506 [====>.........................] - ETA: 7s
137   320/1506 [=====>........................] - ETA: 7s
138   352/1506 [======>.......................] - ETA: 7s
139   384/1506 [======>.......................] - ETA: 7s
140   416/1506 [=======>......................] - ETA: 7s
141   448/1506 [=======>......................] - ETA: 6s
142   480/1506 [========>.....................] - ETA: 6s
143   512/1506 [=========>....................] - ETA: 6s
144   544/1506 [=========>....................] - ETA: 6s
145   576/1506 [==========>...................] - ETA: 6s
146   608/1506 [===========>..................] - ETA: 5s
147   640/1506 [===========>..................] - ETA: 5s
```

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148    672/1506 [===========>...................] - ETA: 5s
149    704/1506 [============>..................] - ETA: 5s
150    736/1506 [============>..................] - ETA: 4s
151    768/1506 [=============>.................] - ETA: 4s
152    800/1506 [=============>.................] - ETA: 4s
153    832/1506 [==============>................] - ETA: 4s
154    864/1506 [==============>...............] - ETA: 4s
155    896/1506 [===============>..............] - ETA: 3s
156    928/1506 [===============>..............] - ETA: 3s
157    960/1506 [================>.............] - ETA: 3s
158    992/1506 [================>.............] - ETA: 3s
159   1024/1506 [=================>............] - ETA: 3s
160   1056/1506 [==================>...........] - ETA: 2s
161   1088/1506 [==================>...........] - ETA: 2s
162   1120/1506 [===================>..........] - ETA: 2s
163   1152/1506 [===================>..........] - ETA: 2s
164   1184/1506 [====================>.........] - ETA: 2s
165   1216/1506 [=====================>........] - ETA: 1s
166   1248/1506 [=====================>........] - ETA: 1s
167   1280/1506 [======================>.......] - ETA: 1s
168   1312/1506 [=======================>......] - ETA: 1s
169   1344/1506 [=======================>......] - ETA: 1s
170   1376/1506 [========================>.....] - ETA: 0s
171   1408/1506 [=========================>....] - ETA: 0s
172   1440/1506 [=========================>....] - ETA: 0s
173   1472/1506 [==========================>...] - ETA: 0s
174   1504/1506 [==========================>...] - ETA: 0s
175   1506/1506 [==============================] - 10s 7ms/step
176 ['loss', 'acc']
177 [0.05439373310249477, 0.8924302788844621]
178 Ahora vamos a dibujar la matriz de confusion
179 ['benign', 'premalignant', 'malignant']
180 Normalized confusion matrix
181 [[0.83950617 0.1399177  0.02057613]
182  [0.13921569 0.84901961 0.01176471]
183  [0.00784314 0.00588235 0.98627451]]
184 El entrenamiento ha llevado : 2732.679208755493
185
```