```
 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=52649
 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 2019-04-28 09:42:09.638416: I tensorflow/core/platform/
   cpu_feature_guard.cc:141] Your CPU supports instructions
   that this TensorFlow binary was not compiled to use: AVX2
32 2019-04-28 09:42:09.895688: 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 2019-04-28 09:42:09.942689: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1511] Adding visible gpu
   devices: 0
37 2019-04-28 09:42:13.724465: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:982] Device interconnect
   StreamExecutor with strength 1 edge matrix:
38 2019-04-28 09:42:13.724569: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:988]        0
39 2019-04-28 09:42:13.724624: I tensorflow/core/
   common_runtime/gpu/gpu_device.cc:1001] 0:    N
40 2019-04-28 09:42:13.770083: 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  - 110s - loss: 0.6971 - acc: 0.6677 - val_loss: 1.0266 -
   val_acc: 0.6639
45 Epoch 2/40
46  - 83s - loss: 0.6029 - acc: 0.7448 - val_loss: 0.6780 -
   val_acc: 0.7212
47 Epoch 3/40
48  - 79s - loss: 0.4280 - acc: 0.8094 - val_loss: 0.6244 -
   val_acc: 0.7535
49 Epoch 4/40
50  - 82s - loss: 0.4240 - acc: 0.8156 - val_loss: 0.6447 -
   val_acc: 0.7436
51 Epoch 5/40
52  - 105s - loss: 0.3970 - acc: 0.8208 - val_loss: 0.4315 -
   val_acc: 0.8108
53 Epoch 6/40
54  - 124s - loss: 0.3670 - acc: 0.8479 - val_loss: 0.4944 -
   val_acc: 0.7452
55 Epoch 7/40
56  - 72s - loss: 0.3130 - acc: 0.8719 - val_loss: 0.6072 -
   val_acc: 0.7552
57 Epoch 8/40
58  - 59s - loss: 0.3571 - acc: 0.8677 - val_loss: 0.5679 -
   val_acc: 0.7029
59 Epoch 9/40
```

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60   - 63s - loss: 0.3414 - acc: 0.8760 - val_loss: 0.3786 -
     val_acc: 0.8373
61 Epoch 10/40
62   - 81s - loss: 0.2953 - acc: 0.8885 - val_loss: 0.9390 -
     val_acc: 0.6913
63 Epoch 11/40
64   - 70s - loss: 0.3126 - acc: 0.8583 - val_loss: 0.4762 -
     val_acc: 0.8108
65 Epoch 12/40
66   - 70s - loss: 0.2988 - acc: 0.8906 - val_loss: 0.5798 -
     val_acc: 0.7959
67 Epoch 13/40
68   - 70s - loss: 0.2678 - acc: 0.8885 - val_loss: 0.5346 -
     val_acc: 0.7784
69 Epoch 14/40
70   - 77s - loss: 0.2215 - acc: 0.9229 - val_loss: 0.4654 -
     val_acc: 0.8083
71
72 Epoch 00014: ReduceLROnPlateau reducing learning rate to
     0.00020000000949949026.
73 Epoch 15/40
74   - 65s - loss: 0.2027 - acc: 0.9219 - val_loss: 0.4808 -
     val_acc: 0.8000
75 Epoch 16/40
76   - 71s - loss: 0.1705 - acc: 0.9344 - val_loss: 0.3802 -
     val_acc: 0.8407
77 Epoch 17/40
78   - 70s - loss: 0.1589 - acc: 0.9490 - val_loss: 0.3802 -
     val_acc: 0.8382
79 Epoch 18/40
80   - 72s - loss: 0.1071 - acc: 0.9635 - val_loss: 0.3580 -
     val_acc: 0.8523
81 Epoch 19/40
82   - 73s - loss: 0.1255 - acc: 0.9500 - val_loss: 0.3334 -
     val_acc: 0.8539
83 Epoch 20/40
84   - 58s - loss: 0.0996 - acc: 0.9635 - val_loss: 0.3595 -
     val_acc: 0.8531
85 Epoch 21/40
86   - 50s - loss: 0.0947 - acc: 0.9615 - val_loss: 0.3731 -
     val_acc: 0.8539
87 Epoch 22/40
88   - 57s - loss: 0.0894 - acc: 0.9698 - val_loss: 0.3395 -
     val_acc: 0.8639
89 Epoch 23/40
```

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 90   - 58s - loss: 0.0763 - acc: 0.9750 - val_loss: 0.3688 -
      val_acc: 0.8556
 91 Epoch 24/40
 92   - 59s - loss: 0.0629 - acc: 0.9802 - val_loss: 0.3942 -
      val_acc: 0.8539
 93
 94 Epoch 00024: ReduceLROnPlateau reducing learning rate to
      2.0000000949949027e-05.
 95 Epoch 25/40
 96   - 60s - loss: 0.0908 - acc: 0.9719 - val_loss: 0.3854 -
      val_acc: 0.8573
 97 Epoch 26/40
 98   - 62s - loss: 0.0449 - acc: 0.9865 - val_loss: 0.3720 -
      val_acc: 0.8589
 99 Epoch 27/40
100   - 60s - loss: 0.0842 - acc: 0.9729 - val_loss: 0.3707 -
      val_acc: 0.8589
101 Epoch 28/40
102   - 73s - loss: 0.0640 - acc: 0.9844 - val_loss: 0.3691 -
      val_acc: 0.8622
103 Epoch 29/40
104   - 132s - loss: 0.0728 - acc: 0.9729 - val_loss: 0.3692
      - val_acc: 0.8622
105
106 Epoch 00029: ReduceLROnPlateau reducing learning rate to
      2.000001313746906e-06.
107 Entrenamiento completado, se procede al test final
108
109   32/1506 [..............................] - ETA: 59s
110   64/1506 [>.............................] - ETA: 59s
111   96/1506 [>.............................] - ETA: 1:01
112  128/1506 [=>............................] - ETA: 57s
113  160/1506 [==>...........................] - ETA: 56s
114  192/1506 [==>...........................] - ETA: 53s
115  224/1506 [===>..........................] - ETA: 51s
116  256/1506 [====>.........................] - ETA: 48s
117  288/1506 [====>.........................] - ETA: 48s
118  320/1506 [=====>........................] - ETA: 46s
119  352/1506 [======>.......................] - ETA: 45s
120  384/1506 [======>.......................] - ETA: 44s
121  416/1506 [=======>......................] - ETA: 42s
122  448/1506 [=======>......................] - ETA: 41s
123  480/1506 [========>.....................] - ETA: 40s
124  512/1506 [=========>....................] - ETA: 38s
125  544/1506 [=========>....................] - ETA: 37s
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126   576/1506 [=========>...................] - ETA: 36s
127   608/1506 [==========>..................] - ETA: 35s
128   640/1506 [===========>.................] - ETA: 33s
129   672/1506 [============>................] - ETA: 32s
130   704/1506 [=============>...............] - ETA: 31s
131   736/1506 [=============>...............] - ETA: 31s
132   768/1506 [==============>..............] - ETA: 29s
133   800/1506 [==============>..............] - ETA: 28s
134   832/1506 [===============>.............] - ETA: 26s
135   864/1506 [================>............] - ETA: 25s
136   896/1506 [================>............] - ETA: 24s
137   928/1506 [=================>...........] - ETA: 23s
138   960/1506 [==================>..........] - ETA: 21s
139   992/1506 [==================>..........] - ETA: 20s
140  1024/1506 [===================>.........] - ETA: 19s
141  1056/1506 [===================>.........] - ETA: 17s
142  1088/1506 [====================>........] - ETA: 16s
143  1120/1506 [=====================>.......] - ETA: 15s
144  1152/1506 [=====================>.......] - ETA: 13s
145  1184/1506 [======================>......] - ETA: 12s
146  1216/1506 [======================>......] - ETA: 11s
147  1248/1506 [=======================>.....] - ETA: 10s
148  1280/1506 [========================>....] - ETA: 8s
149  1312/1506 [========================>....] - ETA: 7s
150  1344/1506 [=========================>...] - ETA: 6s
151  1376/1506 [=========================>...] - ETA: 5s
152  1408/1506 [==========================>..] - ETA: 3s
153  1440/1506 [==========================>..] - ETA: 2s
154  1472/1506 [===========================>.] - ETA: 1s
155  1504/1506 [===========================>.] - ETA: 0s
156  1506/1506 [============================] - 61s 41ms/
     step
157 ['loss', 'acc']
158 [0.32792622249222214, 0.8565737051792829]
159 Ahora vamos a dibujar la matriz de confusion
160 ['benign', 'premalignant', 'malignant']
161 Normalized confusion matrix
162 [[0.80039526 0.17391304 0.0256917 ]
163  [0.21548117 0.77405858 0.01046025]
164  [0.00957854 0.00383142 0.98659004]]
165 El entrenamiento ha llevado : 2585.394633769989
166
```